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UNIVERSITY**

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**CINEMATIC VIRTUAL REALITY FILM PRACTICE:
EXPANDED PROFILMIC EVENT AND MODE OF PRODUCTION**

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SCHOOL OF ART, DESIGN & MEDIA

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SCHOOL OF ART, DESIGN & MEDIA

A thesis submitted to the Nanyang Technological University in partial
fulfilment of the requirement for the degree of
Master of Arts (Research)

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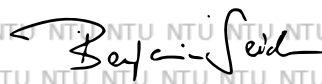
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A handwritten signature in black ink, reading "ciferle chan", is written over a background of repeating "NTU" text. The signature is fluid and cursive.

Chan Fong Yuen

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Abstract

This research investigates the film practice of cinematic virtual reality (CVR), the adoption of virtual reality (VR) technology in filmmaking. With the rapid development of CVR, there are some new film practices formed and shared by filmmakers, as well as a growing amount of academic research studying on its on-screen aesthetics, attempting to theorise screen grammar to navigate audience attention responding to the designed storyline, as well as how to enhance their immersive experience with a sense of presence. However, there are few academic studies that focus on the film practice of CVR production which has fundamental differences compared to conventional filmmaking.

In filmmaking as a collective work, every department collaboratively takes different responsibilities to create the filmic space (cinema space) as well as the production space including the *profilmic event*, the space that serves the camera frame on film sets. In conventional film production, every creative and producing decision is driven by the directional camera which captures rectangular frames. Imagery expansion from widescreen *CinemaScope* to frameless CVR has fundamental changes in all kinds of work in a film production, from screenwriting to directing to cinematography. This research investigates how the spherical filmic space and the expanded profilmic event redefine the routine on-location film practices and the spatial arrangement on CVR film sets.

While the long-established conventional film practices can merely be directly adapted to the expanded profilmic event on CVR film sets, the job responsibilities of CVR major creative roles are no longer the same as conventional roles. What the immersive technology innovates in filmmaking is neither only the aesthetics nor merely a technological transformation of film practice. It redefines the occupational role of creative members. This research investigates the job tasks and responsibilities of three major creative roles - director, screenwriter and cinematographer, and examines the occupational changes of these roles.

In the process of adapting new skills and techniques to CVR filmmaking, similarities are found between CVR and the long-established theatre. This research attempts to align CVR and theatre for a parallel comparison to examine the application of theatre production to CVR productions. This research aims to achieve industrial reflexivity in the CVR filmmaking process, contributing to film production studies by theorising how newly developed technology has led to new film practices and a distinct mode of production.

Table of Contents

1. Introduction	10
1.1 Defining Cinematic Virtual Reality	13
1.2 Shooting Systems of Live-Action Cinematic Virtual Reality	28
1.3 Research Questions	36
1.4 Scope of This Research	37
2. Literature Review	40
2.1 Production Culture and Mode of Production	40
2.2 Cinema as New Media	54
2.3 Major Creative Roles in Conventional Film Practice	64
2.3.1 Film Director	67
2.3.2 Screenwriter	71
2.3.3 Cinematographer	73
2.4 The Profilmic Event and Production Spaces in Conventional Filmmaking	76
3. Methodology	83
4. Observation, Analysis and Findings	92
4.1 Observation of the Occupational Role in CVR Production	92
4.1.1 CVR Film Director	93
4.1.2 CVR screenwriter	103
4.1.3 CVR Cinematographer	113
4.2 Expanded Profilmic Event and On-Location Film Practices in Cinematic Virtual Reality Production	125
4.3 Cinematic Virtual Reality and Theatre	134
5. Discussion	141
Appendix	146
Interview Transcripts	146
1. Director HUANG Dan-Chi 黃丹琪 and Director Morgan Ommer	146
2. Director & Screenwriter Milad Tangshir	171
3. Director & Screenwriter HO Wi-Ding 何蔚庭	192
4. Director & Screenwriter Alexey Marfin 馬樂思	227
5. Director Josema Roig	258
6. Screenwriter Joshua Rubin	295
Bibliography / Reference	313

1. Introduction

Over the years of technological development of virtual reality, the adoption of virtual reality technology in filmmaking has emerged as an art form and is getting more attention in the public. According to Molodtsov's (2019) report on *VR Film Review*¹, there were over 60 VR film festivals across the globe in 2019. This impressive amount indicates the rapid growth and capability of this new medium. There is also a growing number of academic research on the aesthetics of the immersive media, however, there is less studies on the production practice. Despite that there are no widely recognised and standardised industrial norms of VR film production practice at the current point of time, such as the long established production paradigm in conventional filmmaking has, VR filmmaking is developing into 'a yet-to-be-mature industry'.

As the technology evolves, there are different types of VR films including all interactive, non-interactive, live-action and animated immersive experiences. Amongst all types of immersive films, non-interactive and live-action *cinematic virtual reality* (CVR) is the focus in this research. In comparison between regular moving images and CVR in this research, the former one is called 'conventional film'.

Due to the technological difficulties in software stitching and demanding resolution of live-action footage, live-action CVR projects struggle to be mainstream, whilst animated VR

¹ Molodtsov, G. (2018, Dec, 19). 360/VR Cinema Festival Calendar 2019.
<https://vrfilmreview.ru/360-vr-cinema-festival-calendar-2019-3aba6f427ce6>

films dominate the current market. Discomfort of heavy head mounted displays and visually induced motion sickness limit the duration of the medium to under 20 minutes on average. Other problems including latency and self-realisation of heavy headsets are obstacles to maintaining the unique nature of the medium - sense of 'presence'. However, these obstacles have not stopped CVR from innovating its aesthetics as well as its own mode of film practice.

In the history of film as an art form, the digital revolution of cinema has changed the nature of film. It has innovated new ways of storytelling and has reshaped some genres of film, led by sci-fi movies. Not only are the means by which digital technology has undergone a revolution of the way we make films and watch film, equally important has it transformed the mode of production of filmmaking. In filmmaking as a collective work, every department collaboratively takes different responsibilities to create the filmic space (cinema space) as well as the production space, including the *profilmic event*, the spaces used to serve the camera frame. In conventional filmmaking, filmmakers work for the moving images with a rectangular frame which differentiates the location into on-screen space and off-screen space. On the contrary, since CVR filmic space is expanded to horizontal 180-degree or even 360-degree frameless, the means of production differs from conventional filmmaking. Especially when a CVR production captures the 360 degrees space at once, the profilmic event is expanded to the 360-degree surroundings of the camera. The expansion of the filmic space and profilmic event has many inevitable impacts in film practice from pre-production to post-production.

The new film practice embarks on an occupational change in major creative roles. Due to the expanded filmic space, CVR filmmakers have to envision the 180-360 degrees of the

performance space, whose job tasks are hugely different from the conventional roles. Not only do creative members experience revolutionary changes, but also on-location technical crews have to adapt to new routine shooting practice and new spatial arrangement of production spaces. Nevertheless, since this research study focuses on the expanded profilmic event, the investigation will focus on three major creative members who greatly contribute to the profilmic event - director, screenwriter and cinematographer.

During the adaptation to new film practices in CVR filmmaking, CVR filmmakers find the similarities between CVR filmmaking and theatre productions, including actor performance, blockings, and the work of rehearsal. This research studies the difference between cinema and theatre, and then aligns CVR and theatre for a parallel comparison to examine the application of theatre production to CVR productions.

This research explores how the spherical filmic space and the expanded profilmic event redefine the routine shooting practice and spatial arrangement on CVR film sets by interviewing CVR practitioners and textual analysis of online resources. This research aims at achieving industrial reflexivity in CVR film practice. It is a scholarly attempt to theorise how newly developed technology leads to new film practices and a new mode of production.

1.1 Defining Cinematic Virtual Reality

Virtual Reality

Despite the fact that 'virtual' and 'reality' contradict each other, as one word it gives a new perception of subjective reality. Having over 20 years of creating VR systems and application experience, Jason Jerald (2016) wrote the best-selling book *The VR Book: Human-Centered Design for Virtual Reality* which gives a lot of foundations of definition.

Virtual reality is defined to be a computer-generated digital environment that can be experienced and interacted with as if that environment were real (p. 9).

VR is about psychologically being in a place different than where one is physically located, where that place may be a replica of the real world or may be an imaginary world that does not exist and never could exist (p. 45).

Virtual reality is a virtual world that imitates the real world, which is experienced via hardware devices, also called a *reality system*, such as visual displays, speakers, haptics and motion platforms. *6 degree-of-freedom*² (6DOF) reality systems enable users to physically walk around the virtual space. Some even allow users to touch the real objects. On the other hand, *3 degrees-of-freedom* (3DOF) reality systems only allow viewers to move the viewing device or to

² Degree-of-freedom (DOF) is the number of directions a subject/object can move in a 3-dimensional space. There are a total of 6 degrees of freedom divided into two categories, rotational movements and translational movements. Each category has 3DOF. Rotational movements include rolling, pitching and yawing; Translational movements include elevating, strafing and surging. 6DOF VR tracks users' movements in all directions in the virtual space, making the experience as real as possible; 3DOF VR cannot determine the translational movement (motion from one point to another in a space), it only tracks the orientation of a viewer's head. Thus, 6DOF VR is more immersive and realistic than 3DOF VR. 3DOF is better suited for static environments where viewers observe scenarios (e.g. cinematic virtual reality), while 6DOF is ideal for users that involve physical interactions and navigating the virtual space.

turn their head to watch the image at a fixed position.

VR users experience and interact with the synthetic virtual world through different perceptual modalities - sight, hearing, touch etc. Multiple sensory modalities work together to lead us to perceive space and time. Jerald emphasises that the human component of VR is more vital than the technology input. Without a clear understanding of the human element of VR, the experience will fail.

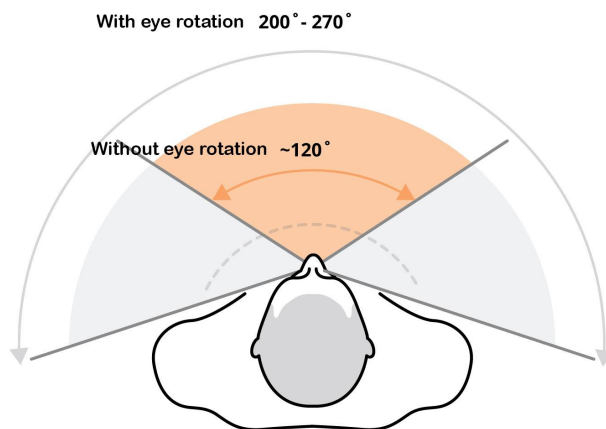
Other than the commonly known virtual reality technology adoption in gaming, there are many more VR adoptions in all walks of life. For example, VR is being used as an immersive and interactive teaching and training platform such as flight training and higher education. VR is also being adopted in healthcare as a surgical training purpose, a patient condition stimulation and a method to pain treatment etc.

Field of Regard (FOR), Field of View (FOV), Point of View (POV) and Point of Interest (POI)

Field of regard (FOR) is the total area that a moving sensor can capture. It is measured in degrees. *Field of view* (FOV) is the range of perceivable areas at a given point in time. In the context of conventional film, *field of view* (FOV) is the maximum area that a camera can capture measured in degrees, which means the observable area that a viewer can see. In the context of VR, FOR and FOV are two different things. FOR is the area of the image that can be seen by moving the eyes, head and body. FOV is the angular area one can perceive at a single point at a particular instant. When a person directly looks in front, he or she has an approximately 120-degree FOV without eye rotation, and up to 200 to 270 degrees with eye rotation (see Figure 1). VR usually has a 360-degree FOR, which is way beyond the FOV of human eyes.

Figure 1

Human Eyes Field of View (FOV)



Note. Modified from a photograph on *Field of View, AR / VR (XR) Typography Guidelines v1.0*

(<https://xr-typography.niteeshyadav.com/reading-experience/technical-aspects/field-of-view>).

Point of view (POV) refers to the perspective of a person, how he or she sees a particular event. In conventional film, the POV of a director means his or her attitude and value expressed in the film; The POV of the audience is the FOV of the film images, they collide as there is only one *point of interest* (POI), the specific point that grabs a viewer's attention. On the other hand, in VR, the expanded FOR enables multiple POIs at any moment.

Immersion and Presence

Immersion is the featured capability of virtual reality to engage viewers/users in the experience. How the viewers/users subjectively perceive the immersive experience is known as *presence*.

Presence is an awareness in the moment of being immersed in a virtual world while having a temporary amnesia or agnosia of the real world and the technical medium of the experience (Jerald, 2016, p. 46).

In the history of screen media, advancements have been made on different technological and aesthetic characteristics of both the content and the reality system to increase the immersion of the experience. Immersive media educator Ben Shedd's (1989, 1993-1997, 2020) studies of the evolution of gigantic screen and how it stands out from regular screen/frame, the gigantic images have been expanding the edges of the projected images beyond human peripheral vision, becoming a cinematic world. The larger the screen is, the greater immersion is enabled. Over the years of development on screen technologies, various large screen formats were

invented to provide the audience with a greater immersive experience of a framed image, including IMAX, *Omnimax*, *Planetarium*, *Fulldome*, *iDome*, cylindrical panorama, three-dimensional cinema and the most immersive format, Head-Mount Display (HMD). The greatest immersion was achieved when the largest image was created and when a wide FOV screen medium was made available to watch that image - the experience of watching a 360-degree full spherical image on a wide field of view (FOV) HMD imitates the human eye experience.

There are other technological changes that enable greater immersion such as interactivity such as stereoscopy and interactivity.

Head-Mount Display (HMD)

A head-mount display (HMD), or a headset, is a display device that is attached to viewers' heads. A HMD displays image and sound according to head movements which imitate the real-world experience. It displays an equirectangular image in a sphere which takes up the entire field of view. HMDs from different brands have different fixed-degree field of view (currently around 120 degrees) and orientation tracking systems. An orientation tracking system measures the rate of change in orientation and speed, and updates the image according to the measurement. *For a virtual object to appear stable in space, the display must be appropriately updated as a function of the current pose of the head* (Jerald, 2016, p. 32). A more affordable

alternative was introduced in 2014, Google Cardboard, which is a handheld device that allows viewers to watch VR content on their smartphones. Due to the weight of a HMD, wearing it can cause discomfort such as fatigue and neck pain. There are other VR health issues collectively known as cybersickness such as eye strain and motion sickness. When the immersion gives the brain a signal of moving but the body is static, this disconnection of the brain and the body causes nausea and dizziness.

Monoscopic vs Stereoscopic

Another factor that gives VR users a more immersive experience is the depth of field - *stereopsis* (depth perception).

Stereopsis (also known as binocular fusion) occurs when the brain combines separate and slightly different images from each eye to form a single percept that contains a vivid sense of depth (Jerald, 2016, p. 120).

Moving images involving the binocular disparity are called *stereoscopic*, otherwise, it is called *monoscopic*. Monoscopic VR means that one image is directed to both eyes while stereoscopic VR means that there are two different images, and one is directed to each eye. On one hand, in monoscopic VR, two eyes see the same depth of the image. A close-up in monoscopic VR is nothing that seems truly closer to the viewer, but only bigger. On the other hand, in stereoscopic VR, the two images are from two different angles at the *interpupillary distance* (the distance between pupils), which imitate how

human eyes view the real world with depth information. The close-up in stereoscopic VR looks like it comes out at the viewer. Stereopsis allows viewers to perceive a more naturalistic feeling of depth as this is what humans perceive in real life. Thus, stereoscopic VR results in better visual acuity than monoscopic VR. Both monoscopic VR and stereoscopic VR can be watched on a headset, but only monoscopic VR can be watched on a flat screen.

Compared to monoscopic VR, stereoscopic VR requires more technical skills and time in shooting and post-production. To suggest a depth of field of an object in an image, stereoscopic VR needs an accurate stitching for the binocular disparity in the two different images for both eyes. Stitching issues and parallax effects of stereoscopic VR are more prominent and visible compared to monoscopic VR when the subject is too close to the camera. Also, image flaws such as lens distortion and chromatic aberration³ in monoscopic VR may not be a big issue, but in stereoscopic VR, it would affect the viewing experience badly as any small discrepancy is magnified, flaws are noticeable. Double amount of visual materials and possible errors of *parallax*⁴ effect in the challenging post production stage lead to a higher production cost of stereoscopic VR. Overall, monoscopic VR is more affordable to produce, therefore, it is more common and has become the dominant majority.

³ Chromatic aberration is an optical problem that occurs when the colours are not able to be brought to the same focal plane. As a result, there will be coloured edges around the subject in the image.

⁴ Parallax is the relative movement of objects as a result of a change in point of view, which is a cue for depth perception. Due to different lenses being used in stereoscopic filming, this can lead to objects moving in different speeds or out of frame, and causing the viewer a 'double vision'.

Interactivity

Some 360° videos are mis-categorised as 'interactive' for marketing purposes. They give the audience a relatively greater freedom in their viewing experience compared to regular moving images - simply allowing the audiences to move the viewing device or to turn their head with a headset to change the point of interest (POI). However, this one-sided input is not considered truly interactive. An appropriate categorisation of 'interactivity' in virtual reality should be defined by the interaction between both the VR content and the audience. Interactive VR content does not only provide the viewers with the freedom to change their point of interest (POI), but also the ability to modify the immersive content. Unlike immersive content with a fixed output, interactive VR is modifiable. According to interactive media scholar Maria Cecilia Reyes's definition, CVR is different from VR which allow interactors to modify the virtual environment (VE) in real time, CVR viewers can only observe the VE and interact with it by activating the overlying objects through the interface. According to VR scholar Jason Jerald's book *The VR Book: Human-Centered Design for Virtual Reality*, 'interaction is the communication that occurs between a user and the VR application that is mediated through the use of input and output devices' (p. 275). Only when there are inputs and outputs from both the VR and the users, when there are actions performable, is it considered interactive VR. Some refer VR users to visitors instead of viewers because they do not only view the virtual world, but interact with it. The relationship between a user and the VR application is called affordances, the possibilities of actions. Affordance is the actions in the virtual environment perceived as performable by the VR user and how the VR application performs an action upon

perceiving users' input. For example, a virtual hand affords selection; chairs afford sitting on. Affordance is a design guide of interactive VR. A good interaction design is using the appropriate affordances to achieve the virtual action easily with the technology used. For example, a tracking system that is able to track the accurate walking distance. The notion of affordances is in accordance with *Interactive fidelity*. In the spectrum of interactive fidelity, the two ends are realistic interactions and non-realistic interactions. From a production perspective, some VR interactions are designed to imitate reality as closely as possible. Whilst some are made to create an immersive fictional story.

With regards to storytelling, Interactive VR presents different alternatives to diversify the narration. Compared to conventional linear narrative film, interactive VR content can be linear or *nonlinear* due to its flexibility on narrative variables. In the screenwriting framework proposed by an interactive media scholar Maria Cecilia Reyes (2017), the screenplay is graph-based-structured with narrative nodes that can be the source or destination of another one or of multiple nodes. Therefore, different users will have different viewing journeys in the same nonlinear VR content.

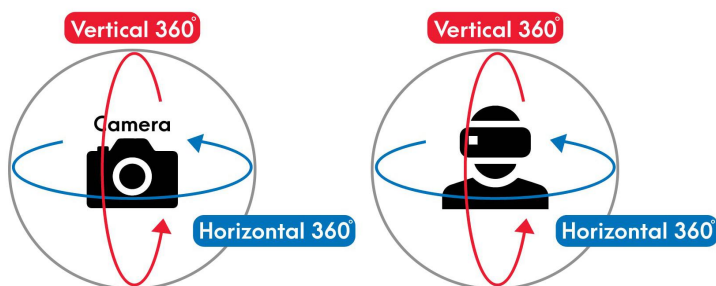
360° VR Film

The adaptation of virtual reality technology in moving images is called virtual reality films (VR film). According to Jason Jerald's book *The VR Book: Human-Centered Design for Virtual Reality*, the filmic space of a VR film can be up to '720°' from pole to pole, including both 360° spaces - left to right 360-degree and up and down 360-degree (see Figure 2). However, VR film is commonly referred to as 360° film, or 360° video. There is also the front-facing format - 180-degree CVR, which is only a half sphere.

The most significant feature of a CVR is the panoramic equirectangular image which wraps into a full sphere with the sound spatialized. The image can be composed of live-action footage captured by a 360 camera, or digitally synthesised by *computer-generated* (CG) materials, or a combination of both. Unlike 6 degrees-of-freedom (6DOF) VR where you can walk and interact with the virtual environment, 360° VR film is only 3 degrees-of-freedom (3DOF), whose viewers are allowed, at the mercy of the camera position, to move the viewing device or to turn their head to watch the frameless image.

Figure 2

720° Filmic Space



What is Cinematic Virtual Reality (CVR)?

Cinematic virtual reality (CVR) is VR moving images commonly known as VR film or 360° film.

Yet, not all VR moving images are considered cinematic virtual reality. 360° VR film and CVR are not interchangeable. There are two key critical features to differentiate CVR from other VR moving images. Firstly, only if the primary screening platform of the 360° content is suggested a head-mounted display (HMD), regardless of the interactivity and whether it is monoscopic or stereoscopic, it fulfils half of the criterias of a 'cinematic virtual reality'. It means that technically the content can be screened on a flatscreen, but watching it on a headset is preferred as the creator's intention. It is a similar concept that some moving images being watched on a computer screen or a tablet are called videos but not films or movies, because they are not created to be watched in cinemas (or movie theatres). Technically films and movies can be watched on any platform such as a portable digital device or a standalone projection screen, but watching it in cinema is primarily preferred. There are some feature-length narrative films or movies only uploaded to online platforms such as Youtube, and the filmmakers may not intend to screen them in cinema. These are considered exceptional cases in conventional films, in which the second feature must be considered.

Secondly, as the prefix 'cinematic' suggested, the narrative and aesthetic nature of cinematic virtual reality are more close to cinema, the conventional film, than video, a recording of moving images. In the aspect of aesthetics, CVR inherits some of the cinematic visual and audio elements that have been long established in the conventional film, such as set design, sound design, cinematographic lighting, mise-en-scène and most importantly, the narrative style.

Unlike some 360° moving images such as virtual tour videos which simply function as the exhibition of a place, CVR is character-based and plot-structured, which makes it different from other visually cinematic immersive experiences without a plotted-story.

These two features are not the exclusive definition criteria of CVR, but two features of CVR at this point of development of the medium. As digital technology continues to evolve, there are so many available means to upload and screen a moving images file including CVR, such as any digital screen or projector screen. Thus, there are exceptional cases. In order to identify CVR, one should look into its aesthetic qualities.

Cinematic Virtual Reality in Academic Discourse

In the academic field, there are some similar thoughts of the definition of cinematic virtual reality (CVR). Scholars distinguish CVR from interactive virtual reality (VR), in which CVR is categorised as the oppositional type of interactive VR. In other words, CVR is a kind of non-interactive immersive content that can only be watched and observed. Regarding the interactivity, CVR scholar Kath Dooley (2019) describes CVR as a '*passive end of the spectrum of current VR forms*' (p. 82). Interactive media scholar Maria Cecilia Reyes also agrees with the absence of interactivity in CVR and puts up film and video as a comparison. Reyes proposes that CVR is an enhanced film or video experience, which implies that CVR inherits the cinematic elements from film. VR scholar John Mateer also denies the interactivity of the CVR and points out the technical difference between CVR and interactive VR. According to Mateer, the virtual

world in interactive VR is generated through processing graphics and triggering audio in real time, while CVR is solely composed of pre-rendered images and spatialised audio. Unlike the real-time rendering feature of gaming, CVR shares the same pre-rendering characteristics with film. Many of the scholars find the similarities between CVR and the conventional film.

Some scholars consider the screening platform as one of the determining factors of the definition of CVR. '*In Cinematic Virtual Reality (CVR), the viewer watches omnidirectional movies using head-mounted display (HMD) or other Virtual Reality (VR) devices*' (Rothe, Buscheck and Hußmann, 2019, p. 1). Professor John Pavlik (2021) has a more specific definition of the screening platform and the word 'cinematic':

Cinematic VR provides sight and sound narratives analogous to traditional cinema, but designed as enveloping experiences meant for HMDs (i.e., the motion pictures and sound are omnidirectional, taking in the wearer's entire field of view and acoustic experience) (p. 3).

Up to the current point of time, there is no absolutely unified consensus on the definition of CVR. While a scholarly definition of CVR is still being developed, the emerging consensus amongst scholars is that the term refers to a non-interactive immersive content with cinematic elements to be watched on a head-mounted display.

There are many academic discussions on the comparison between conventional film and CVR. Scholar Kath Dooley did a comprehensive research on the screen grammar of CVR. On one hand, conventional moving images with a rectangular frame encourage the viewer to engage

from a safe distance, which are the literal physical distance between the screen and the audience as well as the emotional distance between the audience and the on-screen characters. On the other hand, many CVR adopt a first-person point of view storytelling technique that can emotionally immerse the viewers by providing them with a sense of presence towards the story. Some scholars compare the social viewing experience of the two art forms. The movie watching in conventional film is a shared experience, however, watching CVR on a headset is a personal experience where the viewer can freely choose their own field of view. Therefore, viewers watching CVR simultaneously may not see the exact point of interest. As a result, it affects their social awareness of 'being together'. A group of scholars from Ludwig Maximilian University of Munich and University of Valencia & i2CAT Foundation have proposed a solution for a shared experience of CVR. While the synchronisation of the media playout on headsets is important, new methods of communication such as ShareVR⁵ and viewport awareness are needed for viewers.

Scholars have also studied the usages of virtual reality technology. According to one statistics conducted in the US in the 2nd and the 3rd quarter of 2019, the average session time of 110,000 VR users is 19.7 minutes.⁶ A session was defined as the duration between when the application is opened and is closed. The statistics result reflects the time that a person is willing to spend on VR in one go. Despite the fact that the duration is limited to under 20 minutes on

⁵ ShareVR is a proof-of-concept prototype using floor projection to enable users to interact with each other in the virtual world.

⁶ Observer Analytics. (November 22, 2019). Average session time of virtual reality (VR) users in the United States between the 2nd and 3rd quarter of 2019, by user type (in minutes) [Graph]. In *Statista*. Retrieved June 08, 2023, from <https://www.statista.com/statistics/1098976/average-session-time-of-vr-users-by-user-type/>

average, filmmakers are keen to explore the possibility of CVR in a longer form while scholars are eager to compare CVR to the mainstream moving images. In John Meteer's (2017) study of the applicability of existing conventional directing techniques for CVR, he puts forward that '*the quality of these assets can approach that found in high-end television or feature film*' (p. 15). The assets that Meteer mentioned are CVR. Meteer tries to bridge the conventional film and CVR by explaining how both media archive *Transportation* theory - *suspension of disbelief* in conventional film and *presence* in CVR. Comparison between CVR and conventional film is in both scholars' and practitioners' interest, in spite of the feasibility of CVR evolving to mainstream moving images according to the current technological development.

1.2 Shooting Systems of Live-Action Cinematic Virtual Reality

The most common cinematic virtual reality (CVR) is 360-CVR followed by 180-CVR. 360-CVR has a 360-degree horizontal field of regard (FOR). By adding up the horizontal and vertical 360 degrees FOR, it equals a full spherical filmic space in total. Producing a 360-CVR involves complicated and comprehensive work from conceptualising the story in pre-production to editing in post-production. This chapter excludes the introduction of every step in the pre-production stage and the detailed explanations of the complicated post-production workflow, instead it focuses on the production stage, specifically the on-location shooting system of live-action CVR. To film a live-action CVR, there are a few major shooting systems categorised by two filming technological adaptations - using a directional camera with a rectangular frame or using an omnidirectional 360-degree camera, namely a *360 camera*.

Firstly, to compose a full spherical imagery with a regular digital camera, there are three methods that are commonly used. It can be achieved by either filming different quadrants separately and then stitching the footage together in post-production, or by rigging multiple cameras as one big camera and filming the 360-degree simultaneously. Filming different quadrants separately is similar to conventional filmmaking. There is a 'frame' which separates on-screen spaces and off-screen spaces. On-location shooting is done shot by shot. While conventional cinematography changes lenses from shot to shot, CVR shooting uses an ultra-wide-angle lens all the time. After all quadrants are obtained, the footage will be digitally stitched into one complete spherical image, where the 'frames' will be eliminated. There are

pros and cons of filming the 360-degree space in quadrants. One of the major advantages is that better image quality for each quadrant can be ensured by using a regular cine-level camera such as Arri Alexa Camera System or RED Camera. When each quadrant has a higher resolution, a better *dynamic range*⁷ and better *low-light performance*⁸, it benefits the post-production by easing the stitching process and increasing the capability of adding visual effects to the footage. However, there are a few disadvantages of this shooting method. Firstly, it is relatively more time-consuming than shooting the 360-degree space at once regardless of whether a regular camera or a 360 camera is used. Secondly, mise-en-scène is highly restricted by the individual quadrant, actions are not allowed to cross the stitch line (the edge of the frame), especially for blocking of actors, it is not possible to get the human action correctly after stitching. Thirdly, this shooting method requires more imagination from the creative members and actors, as they can only work on a part of the final image at a time. Lastly, when quadrants are filmed separately, maintaining the visual consistency amongst different quadrants could be an issue.

Secondly, to achieve a better image quality and to capture the spherical image at once, CVR filmmakers can rig multiple cameras as one big camera (see Figure 2). Technically, different quadrants are still being filmed separately in different lenses, therefore, manual synchronisation of camera settings and stitching of footage in post-production are still required. There are some software that can help to synchronise all cameras and replicate the exact same settings by one

⁷ Dynamic range is the contrast ratio between the maximum and the minimum measurable light intensities that a camera can capture in a single exposure. In other words, it is the white and black respectively. Dynamic range is measured in stops, with one stop brighter meaning twice as much light. The greater the dynamic range, the more lifelike an image is.

⁸ Low-light performance is defined as the ability of a camera to capture an acceptable and usable image in a low-light environment.

knob or one switch. With simultaneous image capturing, visual consistency problems can be reduced. Also, if real-time video feed of each camera is available to be previewed together side-by-side or routed to one monitor, it is easier for creative members to monitor the entire filmic space and work on adjustment across quadrants. Despite the real-time preview of the multi-camera rig can benefit the image monitoring process, creative members are still required to put in effort to imagine the complete full spherical image as the multi-camera images are not stitched together and thus do not look close to the final stitched image in a spherical presentation.

Figure 2

AXA 360 rig with Sony cameras

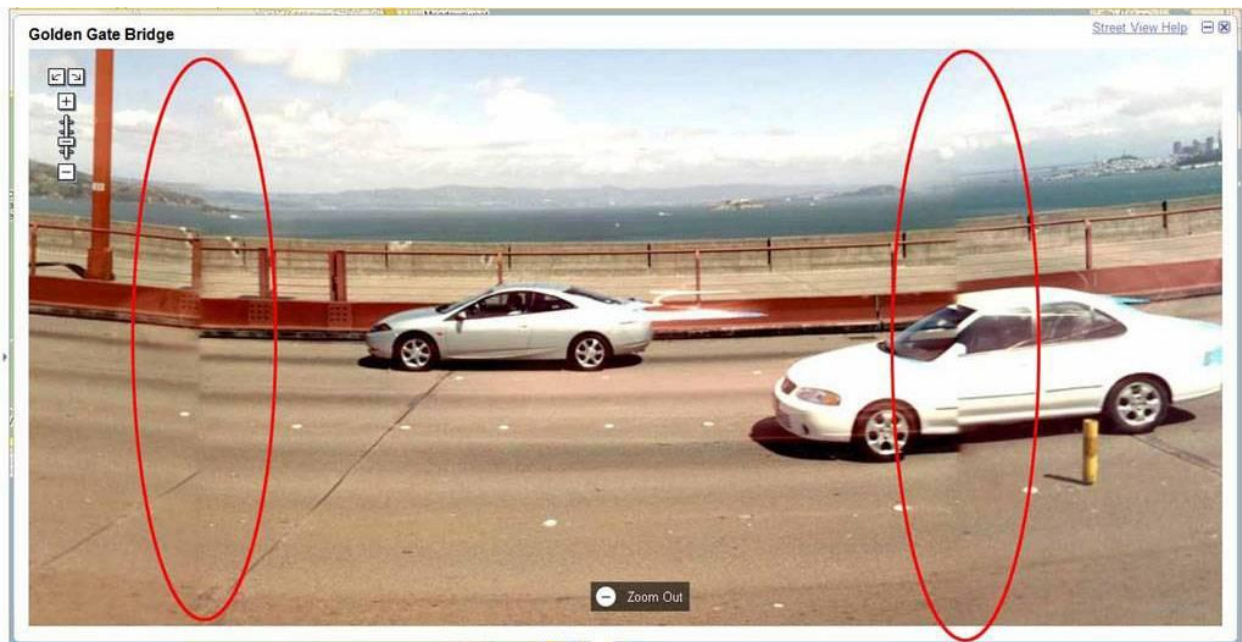


Note. From 360 video sample from AXA 360 rig shows stitching issues [Photograph], by M. Ty, 2017, (<https://360rumors.com/360-video-sample-from-axa-360-rig-shows/>).

The bulky multi-camera rig is a more technically complicated and time-consuming setup which requires specialised professional skills. However, there is a physical limitation that even professionals cannot bypass - parallax stitching error. Parallax is the displacement of an object caused by the change of the camera's point of view, depending on their depth. Due to the physical size of the high-end cameras, a certain amount of space is needed between lenses. (see Figure 2). Therefore, parallax is caused and will lead to stitching failure in stitching footage (see Figure 3).

Figure 3

Stitching Failure



Note. From Ditch the 3D stitch — updated algorithm means a clearer Google Street View

[Photograph], 2017, (<https://ocurus.com/blog/Mzg0>).

VR-ES by Ucam CXK Inc. is a special 360 camera rig to reduce the parallax issue. It uses three GoPro Hero4 cameras with its sensor modular and its lens detached from the processor and the battery to decrease the space between the lenses (see Figure 4). But the image quality of such action cameras is not as good as cine-level cameras. Therefore, using lighter and more compact mirrorless cameras or DSLR is another option, which can be mounted on the same tripod. A higher portability of the lighter rigging is also another advantage.

Figure 4

VR-ES by Ucam CXK Inc.



From *VR-ES is a 360 camera rig for small spaces* [Photograph], March 18, 2017,

(<https://360rumors.com/vr-es-is-360-camera-rig-for-small-spaces/>)

Thirdly, using an omnidirectional 360 camera is the most convenient way to capture the 360-degree filmic space in one shot. There are multiple *fisheye lenses*⁹ each paired to one sensor built-in on the camera, to capture every inch of the surroundings in all directions (see Figure 5).

Figure 5

Insta360 Titan



Note. From Fstoppers Reviews the Insta360 Titan: Eye-Watering Image Quality With a Price Tag to Match [Photograph], W. Ahmad, 2020,

<https://fstoppers.com/originals/fstoppers-reviews-insta360-titan-eye-watering-image-quality-price-tag-match-502661>).

⁹ A fisheye lens is an ultra wide-angle lens that gives a hemispherical image with strong distortion. A fisheye lens usually can capture around 200 degrees of an image.

There are many advantages of using a 360 camera which make it the most common shooting method. A 360 camera is a compact all-in-one camera. Due to its lightweight, a 360 camera is easy to move around. The high mobility enables camera movement as well. The settings of each lens and sensor are synchronised; The recording can be triggered in sync by one click. Therefore, the footage is the same length which benefits the post-production work. For some 360 cameras, a seamless stitched full spherical image can be generated internally by the camera itself. A close-to-real-time panoramic preview of the entire space is available on flat screens. Therefore, it can save CVR filmmakers a lot of time and their effort to imagine the spherical image on film sets. There are some software that have excellent stitching ability in real-time for live streaming, such as StitchBox and VideoStitch Studio. However, with the technological development at the current point of time, most 360 cameras have small sensors that are used in action cameras or webcams, about 1/2.3 inch in size, meaning the image quality and low-light performance of 360 cameras are not as good as cinema-grade cameras with a *full-frame sensor*¹⁰, which limits what can be done in post-production.

In summary, A regular digital camera is preferred over a 360 camera because of its image quality. However, with the rapid development of technology, the image quality of 360 cameras has greatly improved. The light-weight, high mobility, in-camera stitching capability of a 360 camera allows it to be easier to use and more efficient. Therefore, using a 360 camera is the most common shooting method in the industry. Different shooting systems have their pros and

¹⁰ A full-frame sensor is the same size of a 35mm film, 24mm x 36mm. The larger the sensor, the more lights and more details a camera is able to capture, and the higher the image quality is.

cons. CVR filmmakers have to choose the method that suits their aesthetic preference and production needs the best.

1.3 Research Questions

1. How does the **expanded filmic space** bring **new film practice** to cinematic virtual reality (CVR) compared to conventional film?
2. How does the CVR expanded profilmic event **redefine the shooting conventions** in terms of routine workflow and spatial arrangement on film sets?
3. How does the **occupational role** of the director, the screenwriter and the cinematographer in CVR production change from the conventional film production?
4. How do newly developed cinematic virtual reality film practices lead to **a new mode of production of filmmaking**?

1.4 Scope of This Research

In this research, according to the definition of cinematic virtual reality (CVR), 6 degree-of-freedom (6DOF) full room-scale virtual reality is not being examined, only 3 degree-of-freedom (3DOF) CVR is studied. Since this study focuses on the profilmic event of on-location shooting, only CVR that adopts live-action cinematography is studied. Fully computer-generated animation does not involve on-location shooting, instead it heavily relies on computer work, the workflow is not comparable to conventional filmmaking, therefore, animation CVR is not examined.

This research is not limited to one particular kind out of three CVR shooting systems - filming different quadrants separately and then stitching the footage together in post-production, rigging multiple cameras as one and filming different quadrants simultaneously, or using a 360 camera to shoot the 360-degree space at once. At the current point of time, using a 360 camera to shoot the 360-degree space at once is the most common practice in the industry. Therefore, the data collection and findings of this research focus on CVR productions that adopt this shooting system. Yet, other methods are also included in the study. 1 out of the 5 interviewed CVR projects adopted the shooting system of using a regular digital camera to shoot different quadrants then stitch in post-production.

To clearly differentiate different filmmaking of moving images, 'conventional' filmmaking refers to all kinds of film productions using a camera which captures moving images in a frame format, regardless of the aspect ratio and screening platform. Conventional filmmaking is often referred

to as traditional filmmaking. The two words are interchangeable. Yet, in this research, 'conventional' is chosen to avoid any cultural meaning of the word 'traditional'.

There are different divisions of labour styles in different film industries from different countries, the variation is noticeable, such as a missing department, exemplified by the *grip department*. Between the camera department and the lighting department, there is a separate *grip department* dedicated to handle those heavy-duty grip items, for example dolly tracks and rigging clamps. There is the grip department which consists of a *key grip*, *best boy* and grip crew in the Hollywood system, but it is not a common practice in Hong Kong film industry, where the job tasks of the grip department are distributed to the camera and lighting department. In this research, since only major creative roles are examined, the variation of division of labour amongst countries is not a critical factor to the study.

Due to the advancement of image quality and ease of usage of 360 cameras, using a 360 camera to shoot the entire 360-degree space is the most common shooting method in the industry. Therefore, the discussion of CVR film practices in this research focuses on productions that adopt a 360 camera.

As CVR technology and workflows are still evolving, new filmmaking practice may have emerged from the time this thesis has been published. The practices mentioned in this thesis may not reflect the most recent practices in the industry. Since the data collection of this research, interviews of filmmakers, covers CVR productions that took place during 2017 to 2019, to

attempt to include the latest industrial practice into the discussion, up-to-date available online materials such as online articles, behind-the-scenes photos and videos, CVR filmmakers interviewees were consulted.

2. Literature Review

2.1 Production Culture and Mode of Production

John Thornton Caldwell (2008) argues that the study of film practice and filmmakers is as culturally valuable as the mass popular culture and the cinema studies in his book: *Production Culture: Industrial Reflexivity and Critical Practice in Film and Television* which has demonstrated that the collective film production practice is not only a cultural but an academic asset. It is known that industrial work is often isolated from academic discourses. Caldwell has the opposite notion. The industrial work of on-location shooting including the common practices, norms and technologies are interactive forms of cognition, which should not be separated from film theory, instead critical analysis, theoretical elaboration and aesthetic sense making should be involved. In Caldwell's definition, the critical practice of film production is 'deep industrial text' which the film audiences will never 'see'. What and how the outsiders know about film practice is based on what is allowed to be told by the filmmakers, what is being shown on the behind-the-scenes materials, which is well edited before being available to the public. The industrial professional rituals, spaces, union narrativization and machine designs '*are seldom offered as official public explanations – big statements, that is – about “what production means”*' (Caldwell, 2008, p.3). The meaning of the filmmaking practice is not observable. Even when the outsiders of the film industry walk past a film set and observe it from a distance, how the film set operates is hard to be understood by witnessing. Therefore, academic study is where the meaning of filmmaking practice is theorised in a structured way. Another influential film studies scholar David Bordwell (1985) also articulates in his book *The Classical Hollywood*

Cinema: Film Style and Mode of Production to 1960, the importance of the study on film practices. *'We appreciate films more when we realise that in production, every film is a compromise made within constraints'* (Bordwell, 2010, p. 27). His extensive research on both the early Hollywood film production and 'group styles' (Bordwell, 1985, p. 2) demonstrates that the studies of film practice are as important as research on film aesthetics.

To study filmmaking practice academically, the insiders, the practitioners of the industry should be consulted. Filmmakers should be the subject and the primary source in film production studies. Film production technologies, professional practices and industrial iconographies are viewed as 'theorizations-in-practice', a term that John Caldwell uses to connect the industry and the academy. Although film industry practitioners do not identify themselves to any academic status such as a theorist or an ethnographer, they are self-ethnographic; the production communities are cultural expressions. They *'daily deploy critical industrial practices'* (Caldwell, 2008, p. 5). The critical industrial practice of film production is constantly being deployed and amended by the practitioners according to the everyday progress. In Bordwell's study of the early Hollywood film industry, the labour force is one of the elements in the dynamic relationship. (The other two elements are the means of production and the financing of production.) The labour force includes all workers involved directly and indirectly in the film production. The means of production includes all physical capital related to the production, tools and its technology, which implies the techniques that film workers use. The organisation of the labour force is examined in two schemata: the division of the work and the management systems, mainly regarding the detailed division of labour mode. Between 1907 to the

mid-1950s, there were five specific systems (five modes) that display a detailed division of labour: the 'directors' system, the 'director-unit' system, the 'central producer' system, the 'producer-unit' system and the 'package-unit' system. By examining how the division of labour has evolved from the previous mode, the film practices and mode of production of the early Hollywood film industry were systematically defined and studied. It is known that the labour structure of film production is variable across cultures and time. In the research, studying how the job tasks are being distributed to different roles is a beginning to study of the filmmaking practices of CVR. From Caldwell's and Bordwell's studies, film industry practitioners reflexively encode the production ritual and the social order into their daily practice, which need to be decoded through the interpretation of scholars into academic research. Therefore, this research attempts to theorise the 'deep industrial text' into academic research, by interviewing the practitioners who are in the field of work.

Other than studying the practitioners in the film industry, Bordwell articulates that, to study film practice and its mode of production, it is important to study the written materials related to filmmaking, especially the script. Over the years, the function of a film script has expanded from the mechanism to pre-check the quality to the blueprint of how all works should be organised. More comprehensive research on the early Hollywood film practices was archived when the advertising discourse was involved. Bordwell argues that it was the publications such as magazines, newspapers and even posters on billboards that established the standards for quality filmmaking, which have consistently exhibited the values exchanged on the film qualities amongst the practitioners. The inter-exchange of knowledge from the advertising discourse has

massively extended to today's digital communications, the discourse is becoming more inclusive and extensive to the ever-developing filmmaking technologies. Therefore, In this research, the study is expanded to all available online resources.

Although some film productions are intended to be pure art or high art that is separated from average life, most film productions today have become public entertainment or commercial purposes. It is an economic activity that is closely related to our daily life activities. From academic study to the general public understandings towards film production gained from different behind-the-scenes interviews and master classes, we acquiesce in the same notion of that professional film production is formulaic. Filmmakers not only form *aesthetics norms* (Bordwell, 1983, p.3) but also form norms and conventions of film practice, which are gradually established into an industrial standardisation that includes '*uniformity in nomenclature and dimensions, simplification in types, sizes, and grades, and safety provisions and rules of practice*' (Bordwell, 1985, p. 98), which cannot be attributed to accident, but must be an account for the uniformity. Industrial standardisation was then academically defined as the *mode of production* by scholars. David Bordwell also defines the norms of filmmaking practices as the mode of production. He studies how the mode of production of early Hollywood film industry acted as a factory system akin to the Ford plant: a mass production and detailed division of labour. Despite the fact that filmmaking mass production did not reach the assembly-line degree of rigidity that it did in the car industry, it resembles how a factory serially produces a commodity. When filmmaking is taken as an economical mass production in firms, a mode of production is needed to be established to standardise and differentiate the product (films) efficiently for consumer's

demand. The early Hollywood mode of production was a result of standardisation for profit maximisation, which is in line with the prevalent capitalist mode of production, the mode of mass production in the factory system. It is believed that the filmmaking mode of production is established to facilitate efficiency, regularity, stability, conformity, and budgetary control. Bordwell also stipulates the socio-political functions of mode of production of filmmaking, including patent and copyright formulations, state intervention in labour relations and censorship, and its economic practices including distribution and exhibition for theatre (cinema).

As a mature industry with sufficient demand and supply, economic and social activities are indispensable to accounts of any uniformity of the film industry. Although Bordwell articulates that economic practices are the more predominant explanation of the establishment of Hollywood's filmmaking modes of production, the film industry's commitment to ideological/signifying practices are what we should look into as a factor, it has influence on how the productions divide the labour. In Bordwell's studies, the ideological/signifying practices are the individual choices of aesthetics and film language (which was examined in the first part one of his book). The commitment of film practice should be considered as the driving force of the group style, to empower films to share the look and sound regardless of the particular economic factors. The mode of production of filmmaking was established as the critical foundation to the development of film aesthetic group style and served the economic purpose.

By looking at how Bordwell identifies the mode of production of the Hollywood film industry before 1960, it is understood how a 'mode' of filmmaking practices should be defined. Bordwell articulates that the mode is a dynamic relationship between three elements - the labour force, the means of production and the financing of the productions. Each element influences and affects each of the others. The 'labour force' includes *'all workers involved directly and indirectly in the production of the films or the production of physical means to make them'* (p. 92). By the time that Bordwell wrote the book, the titles of filmmaking practitioners were not labelled properly with their roles and job responsibility, but after the industry has evolved for 40 years, the division of labour and the title of each role is clearly defined, their identity is properly specified. Despite the undefined titles to different roles, since last time when filmmaking had been established into an industry, there is always a *'hierarchical and structural arrangement of control over subordinate and separate work functions'* (p. 92) in the labour force, which is to *'assigns work functions to each key management position, making the worker in that position responsible for supervising part of the total labor process.'* (p. 92) 'Means of production' includes all physical capital related to the film production, such as the company building, sets and props, and importantly, its technology - tools and gears. Camera is one of the most representative examples. Camera as a crucial physical capital of film production has critically changed the means of production from film to digital, and therefore has led to two different modes of production. The last element, financing of the production is direct, it refers to the capital of any related purchase and the profit maximisation of the production.

Unlike other art forms such as writing novels and painting that can be created by an individual, manufacturing of films is a serial collective cooperation. There are films that can be done on a one-man-band basis, but in most cases, especially for films that serve the mass entertainment purpose, filmmaking is a complicated and prolonged process that involves teamwork between different creative departments specialised in different aesthetic aspects throughout the few production stages. As Bordwell (1985) analyses the mode of production of early Hollywood film industry by analysing the organisation of the labour force: the division of work and the management, it is suggested that filmmaking mode of production follows a universal division of labour and a systematic production crew structure, for the purpose of achieving '*a faster and more predictable product output*' (p. 95). A film production team consists of various creative departments with an organised hierarchical structure, division of labour and workflow. To identify the labour force of Hollywood productions, Bordwell (1985) looks into the subdivision of the initial work functions and order. He takes a cinematographer as an example of the social division mode: '*the cameraman's duties subdivided to laboratory technicians, to assistants, and to continuity clerks*' (p. 95). Bordwell (1985) also articulates that

This subdivision happened regardless of the management system; the causes lie not in the management structure per se, but in economic practices (increased production rate, increased technological complexities) and in ideological/ signifying practices (demands for certain stylistic qualities in the films) (p. 95).

The management system that Bordwell mentions has three-level of work: *strategic management, tactical or technical management, and execution*. Strategic managers are at the

top level of the hierarchy pyramid. They have the ultimate prerogative power to countermand any subordinate decision. The tactical-decision makers are the middle management, who have retained craft knowledge and most likely will be involved in execution to a certain extent.

Bordwell (1985) explains that there are another five modes called detailed division of the labour system throughout the period from 1907 to the mid-1950s.

In detailed division of labor systems...work positions are divided between those who conceive the work and those who execute it. At the lowest echelons of the structural hierarchy, the split between conception and execution has caused the worker to lose the overall knowledge he or she had of a craft. Instead, the worker knows only the part that the company or schools train him or her to do (p. 96).

Bordwell proposes the alienation of the worker from the work, which took place in the Hollywood film industry earlier or in the year the book was written. With the rapid development of availability of online tutorial materials and the establishment of film schools, nowadays practitioners are more versatile and capable to work in different roles professionally in a production. It is not realistic to determine the workers in the lowest level of the hierarchy are equipped with managerial skills of a film production.

Extending Bordwell's definition of the division of labour system to another way of thinking, on one hand, the subdivision of labour structure is a micro hierarchy within a department. For example, a film director oversees assistant directors and the *script supervisor (continuity)*. They work according to the instructions given by the film director. On the other hand, there is also

the macro production hierarchy which takes place between different creative departments, which is the management system that Bordwell has proposed. Up to this date, in conventional film production, it is known that most productions accept either director-driven mode or producer-driven mode, which means the director, or the producer always has the ultimate decision making power, from script development and crew formation in pre-production to shaping the film style and aesthetics. Either the director or the producer stands at the top of the production hierarchy. It is also common to see that both of them are ranked the top on different aspects at the same time - the director oversees the creative aspect while the producer oversees the administrative and business aspect.

John Caldwell (2008) points out that in the last two decades, the labour policy - '*outsourcing*', the use of independent free-lance '*contract labour*' - has been regularised and developed into a mode of production described as '*downsizing*' or '*right-sizing*', breaking up the old Hollywood studio system, due to new technologies and post-Fordist industrial economy (pp.154-155). It is suggested that any historical explanation should be considered a different pattern of changes in the labour force and mode of production.

When Bordwell (1985) suggests a specific format of management organisation and the subdivision of labour, he also suggests that '*Changes within the mode will be attributed to its conditions of existence: economic and ideological/ signifying practices*' (p. 97). Other than looking at the production crew structure, Bordwell (1983) agrees on what Ramond William has outlined - '*We have to discover the nature of a practice and then its conditions*' (p. 89). To

identify the mode of production, it is important to study the conventions and norms of the industrial practice and the circumstances and factors that make them occur. Filmmaking is an unpredictably changeable but organised work of art. What is planned for the day could be replanned instantly according to the immediate situation. There is no absolute protocol to respond to a situation, but filmmakers are professionally trained to equip themselves with a systematic capability to cope with situations in order. An organised flexibility of this collaborative working style is shared and maintained by the insiders, film industry practitioners.

John Caldwell (2008) puts forward the notion of 'machine intelligence' that '*technologies also function as cultural performances and expressions*' (p.152). Throughout decades of evolution of cinema, from the era of silent film to sound film, to colour film, and to digital film, an off-screen mode of production has been formulated to support on-screen creativity as well as to systematise and homogenise the industry. Caldwell (2008) refers to such modes of production as '*distributed, cognitive phenomena*' when users and technologies interact (p.152). The tools or machines function as smart 'agents' in a cognitive 'network', establishing, cultivating and reinforcing cultural ideas about the function and agency of the crew members. In David Bordwell's theory on the filmmaking mode of production, filmmaking technological developments are not only scientific developments in the history of cinema but are the economic and ideological/ signifying practices that shape the filmmaking mode of production. As technological development changes the production cost, which directly affects the filmmaking market and production economies. When new filmmaking technologies emerge, practitioners are obligated to adapt to it, meaning the film practices have to adjust or even

re-formulate to adapt to them. Bordwell (1985) analyses the Hollywood film industry before 1960 in the book, the industry has successfully developed its technologies and assimilated those chances to the film practices of that time.

Throughout years of development of the Hollywood mode of production, there are some industrial standardised technical workflows. For example, screenwriters obey a standard format of script. Yet, when different cinematography styles are employed in different productions, there are different working styles and collaborative manners. Caldwell explains the hierarchical differences within the camera department by using 'the big-screen mode' and 'the manic handheld video mode' as examples. *'The work task, worker status, worker interrelationships, and the cultural significance of work all change depending on how production technologies are used and why'* (Caldwell, 2008, p.153). It is suggested that the camera itself and the usage of the camera are determinative to the crew structure and the film practice.

Bordwell (1985) mentions the importance of capitalism advertising in adding values to a film; he proposes that *'publicity releases, true or apocryphal, about thousands of extras, millions of dollars, and unique star personalities are all part of the Hollywood mode of production'* (p. 97). Bordwell (1985) also mentions the advantages and disadvantages of theorising the mode of production of filmmaking. Generalisation can help with simplification and unification of such a complex industry, yet, there will be loss of individual differences. Bordwell admitted that *'Just as no single film is the classical Hollywood film, no actual production company is the site of the classical Hollywood production mode'* (p. 95). It is suggested that standardisation and

differentiation are the two crucial concepts that help in defining the mode of production. All in all, the mode of production of the early Hollywood film industry is developed and defined to allow film industry discourse establishment.

Another scholar Jean-Pierre Geuens discusses the mode of production of filmmaking in another perspective, the perspective of how filmmakers look upon the working process on a film set. To some filmmakers, filmmaking is an art creation; however, some think that the daily routine is boring repetitive work, it is just a job more than art-making. In Geuens journal article *The Space of Production*, he defines the mode of production of filmmaking by the daily shooting routine, how film crew translate a script to a film on film set day to day by applying a technique called *coverage* - capturing each moment of the scene from different angles, *medium shots* and *close-up shots* come after the *master shot*. Geuens (2007) breaks down and simplifies the shooting process, and defines the ways of execution as the mode of production:

Once the scene is blocked and the main camera position is assigned, the lighting crew moves in, working its way from the back of the set to the camera (p. 417).

By looking at how the production space is shared and used in a certain order of precedence, it suggests how the routine spatial relationship forms the mode of production on conventional film sets. There are some (changing) norms in the mode of production. Geuens (2007) gives an example about actor placement:

Once the scene is blocked and the main camera position is assigned, the lighting crew moves in, working its way from the back of the set to the camera (p. 417). 'The actor no longer had to stop on their marks, so that the lights would be just right, they could alter their movement in the middle of the scene, surprising all in the process' (p. 419).

Geuens argues that there are certain spatial norms in conventional filmmaking, nonetheless, the nature of filmmaking is capable of flexibility in spatial relationships, as long as they share the same goal and work in sync.

The opposite of a routine spatial relationship is called 'differential spaces', which are the counter-spaces for a shooting style different from the conventional one. Filmmakers who are '*aiming at subverting the mode of production*' are '*free to reshape the space*', according to their unique response to the filming situation (Geuens, 2007, pp. 418-419). A lot of negotiations have been made to achieve a balanced co-working discipline and eventually forming production cultures in conventional film practice. Becker (1974) suggests ways to recognise new convention and mode of production:

We can study social organizations of all kinds by looking for the networks responsible for producing specific events, the overlaps among such cooperative networks, the way participants use conventions to coordinate their activities, how existing conventions simultaneously make coordinated action possible and limit the forms it can take and how the development of new forms of acquiring resources makes change possible (p. 775).

In the context of the profilmic event, the social organisations and networks Becker mentioned can be referred to the on-set filmmaking personnels. Regardless of the crew size of each department, there are networks between departments. Therefore, it is important to study how crew members collaboratively work and share the profilmic event and other production spaces.

In immersive technology as a technological change to filmmaking, what it has brought to the film aesthetics and the production logic are new and fundamental. Filmmaking practices are

expected to change when new technology comes in, just like how it has changed when digitalisation technology was introduced to filmmaking. To understand the impact of immersive technology in filmmaking, it is important to study what CVR practitioners adopt in the production regarding the workflow, communication and spatial usage. With the new film practices, the occupational roles of creative members are expected to be revised. And lastly, the mode of production of CVR is hoped to be defined. The study of the profilmic event integrates the investigation of production geography and the in-depth interviews with filmmaking personnels, as well as the mode of production, the 'deep industrial text'.

2.2 Cinema as New Media

Cinema as an art form was invented early before the age of digitalisation and computerisation, as so-called 'old media'. Before computer media were popularised around 1990, cinema was the original modern *multimedia*. Filmmakers had been combining moving images, sound and text for a century. When cinema, the major cultural and art form in the twentieth century, went into the era of digitalisation and computerisation, same as other art forms, the production was gradually digitised and computerised. Cinema transformed from old media to new media. The development of cinema and computers became further entwined when all existing media were able to be translated into numerical data accessible for the computer and led to new logics of media creation. In cinema as a new media, it has exemplified the technological changes in the aesthetics and the production of media. The 'cultural data' of cinema have reconstructed the ways of seeing reality, of structuring time and space, of narrating human memory, thinking and emotion, of linking one experience to another in a cinematic sense.

Lev Manovich is the first scholar to study new media systematically, he has written the book *The Language of New Media*. In the book, Manovich theories the influence of conventions of 'old' media on the 'new' media. Manovich identifies how computerisation has led to the emergence of new cultural forms such as computer games and virtual world, and how it has redefined the existing media like photography and cinema. Manovich uses 'language' as an umbrella term to signify a number of various conventions in the 'old' media, including analogue cinema, film image, and especially the rectangular frame. The way that Manovich uses 'cinema' is not only

referring to the particular object - film, but it refers to broader cultural traditions including *'mobile cameras, representation of space, editing techniques, narrative conventions, spectator activity - in short, different elements of cinema perception, language, and reception'* (Manovich, 2001, p. 69). 'Cinema' in Manovich's studies is in contrast to another tradition - the printed world. Manovich's research of the impact of digital computers on cinema reflects that new technological development brings new language, aesthetics and production styles to the art form. In Manovich's book *The Language of New Media*, he discusses how cinema impresses more on public memory than other forms of electronic communication. The aesthetics in cinema is stronger in communication than the ability to make contact over a physical distance in real-time. Unlike computers that have millions of users who can understand the computer interface and 'speak' its language (eg. sending emails and running applications), cinema is a medium which the general public can understand but cannot 'speak'. The outsiders of the industry can understand the film language but they cannot 'make films' to communicate to each other. Nevertheless, it is the computers which successfully popularised cinema as a visual Esperanto, a world language installed inside the theatre. A movie theatre is the physical interface of cinema, the architectural window opening up into a virtual three-dimensional space. Yet, cinema's vision is manifested through a frame in the computer world, which has spatialised all kinds of experiences.

The most important cinema's influence on the cultural interfaces is the rectangular framing of represented reality of a camera and its mobility. The rectangular framing is limited with its physical frame, separating the on-screen space (inner space of the frame) and the off-screen

space (outer space of the frame). In spite of that the on-screen space is actually representing a larger scenography around the frame. A frame is known to present just a partial view of a larger space, that is, the mobility of the frame. Another kind of mobility is the literal mobility of a frame. Seeing a camera as an input of data, the camera movements, such as zooming, tilting, panning and tracking, are the visual grammars of interactions in data spaces. More than the two types of mobility of the cinema frame, Manovich assures the importance of cinema lies in its aesthetics strategies. Cinema is a window into a fictional world of a narrative, in which this window has become a window into a datascape. This aesthetics strategy of cinema has been embedded to the basic organisational principle of computer software. *In short, what was cinema is now the human-computer interface* (Manovich, 2001, p. 86).

Manovich also states the limitations of his theories. Some of the principles and characteristics that we identify in new media are not unique to new media, they could be found in old media as well, meaning that they cannot be the only factors to define new media. Manovich then uses cinema as an example to illustrate the appropriation of identification. The 5 principles that Manovich proposed are the 5 changes tendencies of media computerisation that he theorised by the year 2001. The new media he mentions such as cinema/motion pictures, videos, and digital photography, despite evolving at a steady rate, are relatively no longer that 'new' after more than two decades of the book being published, compared to the newly emerging media technology - virtual reality. What Manovich suggests would be some useful directions and guidelines in analysing the impact of the emerging new medium - cinematic virtual reality. In Manovich's (2001) book, he also mentions virtual reality (VR) technology. By the year of 2001,

he agreed that VR was undefined between cinema and theatre. While the VR scenario was considered as an extension of cinema, at the same time, it was also treated as a '*continuation of theatrical traditions such as improvisational or avant-garde theatre*' (p. 91). But Manovich argues that VR has inherited the mode of seeing and language from cinema. When a user is engaged in VR content, his or her body is subordinated to the virtual body provided by the camera. While VR users can explore the virtual world by selecting their own point of view, some fixed outputs such as cuts between shots and preselected viewpoints manifest how the interface inherits cinematic perception. Manovich not only sees virtual reality technology as moving images resembling cinema, but he compares the two art forms in aesthetics and audience perception perspectives.

Manovich brings the discussion of virtual reality technology to an old and simple technology - screen. A screen is a flat and rectangular surface placed at a distance from the audience, its illustration navigates the audience who is just looking at it to experience the virtual spaces, virtually transporting them to somewhere else. The word 'screen' is naturally linked to the display screen of an electronic device. But in the discourse of new media, it is not the only screen. Manovich defines two types of screens - classical screen and dynamic screen. A classical screen is the regular flat and rectangular screen that is intended for frontal viewing. In Manovich's definition, Renaissance's painting is considered a classical screen, as illustrated by the two format names of computer displays - 'landscape' and 'portrait'. Dynamic screen has something more than a classical screen: '*it can display an image over time. This is the screen of cinema, television, video*' (Manovich, 2001, p. 95). Manovich uses the word dynamic because

the screen brings a special relationship between the displayed image and the spectator, a *viewing regime* - the image(s) on the screen strives for a complete illusion and visual plentitude. In reality, a screen is only a physical window with limited dimensions positioned in front of the viewer. But when the viewer focuses on what is being shown inside the window, concentrating his or her mind disregarding the reality space outside of the window, he or she enters the viewing regime, where the spectators are asked to suspend belief, which is in line with *suspension of disbelief*¹¹. Manovich put forward that the screen is not just a neutral representation, it is aggressive in a way that it subjectively filters out information and takes over whatever exists outside of the frame. There are different degrees of filtration depending on the characters of the medium. For example, the filtration in cinema and television vary. Watching television shows on a TV screen with house lights on and people around talking, the viewing experience is less immersive than cinema, merging with the giant screen inside a black box.

Both classical screen and dynamic screen are capturing the past events. There are paintings and films portraying the creators' imagination of the future, but in Manovich's discussion, these are creators' ideas that came up in the past which then were captured on the screens. Real-time screen was introduced as a screen that represents the present. Images on a real-time screen can continually change and update in real time, reflecting changes in the referent. For example, radar shows the changing spatial position of an object; live video shows alteration in visible reality. After the classic screen and dynamic screen, the real-time screen came out and has

¹¹ Suspension of disbelief is a concept that was first phrased by British poet Coleridge in 1817 with reference to the audience for literary work. It means the intentional avoidance of logical thinking in examining something unreal or impossible in reality, in purpose of making oneself emotionally enjoyable in a narrative.

fundamentally changed the idea of what a screen image represents. This temporality character is one way to identify screen type. Manovich proposes another genealogy - the relationship between the space of the viewer and the space of representation. The space of the viewer is the physical body of the spectator; the space of representation is the screen that has a frame and exists in the reality space, what Manovich refers to as a 'cutting reality' window into the virtual space. The relationship between the screen (which is the camera's eye) and the spectator is established when a spectator gazes towards a screen, he or she exists in two spaces - the real space in reality that one's physical body exists in and the on-screen virtual space. In other words, the screen enables the spectator to enter the virtual space. The screen and the (moving) images allow the viewer to travel to different virtual spaces without moving their physical body. For example, the cinema screen takes its audience on a journey without leaving their seat. Before cinema was introduced, films were shown in film theatres, where audiences come and go, maintaining a psychological distance between the cinematic narrative world and the audience. On the other hand, cinema positions the immobile audience to the best viewpoint, which is an essential institution of cinema: *'the cinema relies on the immobility of the spectator, seated in an auditorium'* (pp. 108-109). Manovich even uses 'large prisons' and 'prisoners' as a figure of speech to symbolise cinema and its audience respectively.

Screen is undeniably a revolutionary technology in media history for centuries - from painting in the Renaissance to cinema in the twentieth century. Screen is the major means of containing most media materials - still images, moving images, or text. With the popularisation of smartphones, the screen became part of our lives. The society became a society of screens. The

evolution of screen technology has reached a climax at that point of time when virtual reality (VR) was invented. Instead of viewing a rectangular flat screen at a distance, the screen idea of VR is to completely fill the viewer's field of view with image, whether using a giant screen or the head-mounted display. The 'window' VR is no longer limited to a physical dimension. When the VR image totally replaces the sight of the viewer, it allows the viewer to be present in the virtual world. That's where the real space and the virtual space coincide. In other words, the virtual space, which used to be confined in a painting or a movie frame, now encompasses the real space. *'Frontality, rectangular surface, difference in scale are all gone. The screen has vanished'* (Manovich, 2001, p.97). Although there is the 180-degree half sphere VR, in which a frame still can be seen within the headset, the expanded field of view strengthens the filtration, the viewing regime of VR is much more solid than a rectangular screen. When the cinema screen and computer screen were introduced, people were anticipated to learn the screen from the old art forms like magic lantern show, where things were limited to the 'canvas'. However, when VR screen technology was invented, its volumetric imagery was something that surprised viewers. And today, the close-to-human-eyes viewing experience still surprises viewers by giving a sense of immersion and by changing its relationship with the 'prisoners'. The relationship between the moving images and the viewers changes when the screen is no longer constrained within a frame. In virtual reality, the immobility of the spectator is an obstacle in experiencing the virtual space, instead the spectator should be active to explore the virtual world. The VR that Manovich talks about is interactive VR, regardless if it is narrative-based or game-based. In room-scale 6-DOF VR, the user literally has to move his or her body to experience the virtual movement in the virtual space. *'The spectator is no longer chained, immobilized, anesthetized'*

by the apparatus that serve her ready-made images; now she has to work, to speak, in order to see ' (Manovich, 2001, p.109). Manovich takes the early VR movement tracking system as an example, in which the user had to be wired to the computer. Manovich refers to the VR 'prisoner' as a giant joystick to explain such a paradox of VR - visually free but physically fastened. Nowadays, room-scale 6-DOF VR technology has been improved a lot, the tracking can be done without any cables, VR experiences have become real mobile and free.

In the aesthetic perspective, digitalisation and computerisation have redefined the identity of cinema. The computer has led to some revolutionary technical changes such as altering photographic film images to computer-based moving images, transforming hand-drawn animation to digital animations and enabling the magical visual effects. From analogue media to digital media, from the day Lumière Brothers showed their new Cinématographie camera/project hybrid to to-the-date digital cinema, technologies have changed the way filmmakers construct the filmic space. The advancement of algorithmic programming technology has enabled a greater modification of pixels, allowing filmmaking to have more freedom in creating realistic VFX in post-production. Visual effects (VFX) in live-action movies are the most significant achievement. Special effects (SFX) and visual effects (VFX) work together to create effects on top of the live-action footage. SFX are optical effects that film crews create on film sets, which are filmed on set with the camera. For example, film crews use water trucks and pipes to create artificial rain on film sets. On the other hand, VFX are what comes after in post-production. For example, filmmakers can shoot the actors against a greenscreen on location, and replace the greenscreen with virtual effects in post-production.

Another example is using software to create computer-generated imagery (CGI) like fire, snow and dragons from scratch. Before computer graphics technologies were powerful enough to create the filmic reality, filmmakers had to rely on their own ways to archive SFX during the shoot. Over years of technological development, filmmakers are able to use *LED volume*¹² as a background against the actors to reduce the burden in post-production. The innovative technique is called *In-Camera Visual Effects* (ICVFX) and the method is called *LED Virtual Production*. Through digital means, creators have more possibilities to manipulate the moving images, allowing the filmic space to contain more storytelling possibilities. Thus, the space of digital cinema is 'large'. Manovich uses 'plasticity' this word to describe the capability of being moulded or developed. On the contrary, one downside of the digitalisation of cinema compared to film-captured images, digital live-action images lose the privileged indexical relationship to prefilmic reality because of post-production manipulation.

Over the years of technological development, new techniques born from digitalisation and computerisation have not only revolutionised the aesthetic aspect, but have also redefined the filmmaking practice and the occupational roles of filmmakers. The VFX creative department has transformed from simple techniques such as jump-cut, split-screen, double exposure and changing frame speed, to magical software techniques such as computer-generated imagery (CGI) and 3D rendering . (SFX is still being adopted on film sets to minimise the post-production cost on VFX.) In return, the responsibilities of other departments, especially the camera department and the production design department, are also redefined by the new collaboration

¹² LED volume is a system of linked high-end LED panels used as a background to be captured on film sets.

with the VFX department throughout different stages in the production. For example, when the film production needs to adopt the green screen effect, the producing team, the directing team and the production design team have to plan ahead the execution in pre-production. During the shoot, the cinematographer, the camera operator and assistant camera have to make appropriate camera settings from lighting direction, lens choice to every bit of camera settings. Manovich (2001) summarises the impact of digitalisation and computerisation to filmmaking practice:

In digital filmmaking, shot footage is no longer the final point, it is merely raw material to be manipulated on a computer, where the real construction of a scene will take place. In short, production becomes just the first stage of postproduction (p. 303).

From the pre-production to post-production, filmmaking practices were redefined by the new technologies. When new technologies emerge and are adopted in media creation, new identities are introduced to form new conventions onto the existing practices.

Up to this day, conventional cinema is no longer considered the 'new' media anymore compared with the newly emerging and popularised technology/medium - virtual reality. By learning how Manovich theories the conventional cinema as a new media, he provides scholars with frameworks on how to study the filmmaking practice of cinematic virtual reality.

2.3 Major Creative Roles in Conventional Film Practice

In the studies of film practice, the key subject is the major creative roles in film production. As David Bordwell (1985) addresses in his well-known film studies book - *The Classical Hollywood Cinema: Film Style and Mode of Production to 1960*,

For the average consumer, the important labor areas were the stars, writers, and directors—the most obvious creators of that narrative. These workers could use public recognition to boost their ‘exchange-value’ to the firm, the same way that the firm used that public recognition as an exchange-value to entice the spectator to its products (p. 551).

Bordwell proposes that credit practice, achievement awards and unionisation are significantly reflective of the creative contribution and the mode of production across the film industry. In the first appearance of film credits, it was used as a trademark for the legal purpose of securing the intellectual property right of film production companies. Film credits later became more synonymous with the career of individual film professionals, recognising the creative contribution of a part of the *above-the-line*¹³ creative force, which began with actor-dominated credits. With the proliferation of Hollywood studios and the advent of sound film, the function of film credits has changed to enumerate the impression of the sophistication and craftsmanship of *below-the-line*¹⁴ crew members, building professional resumes for them, even

¹³ Above-the-line is in relation to the film budgets. In the crew list of a film production, there is a line to separate two groups of workforce according to their role responsibilities and their pay. Above-the-line refers to those people who are involved in the creative development, even before pre-production. They make major decisions about the look and feel of the film. There are a few roles that are consistently above the line - director, (executive) producer, screenwriter, casting director, principal cast, and the cinematographer.

¹⁴ Below-the-line is another group on the crew list. It refers to crews who are responsible for the day-to-day work of filmmaking involved in pre-production, production, and post-production.

for camera 'machines'. According to Bordwell (1985), credits are the '*exchange-value*' between a film and its worker, as well as between a film and its spectators. By looking at the opening credit, title card and the possessory credit 'A Film By...', we can recognise the most important and irreplaceable film creators, uniform production practice and a part of the management structure of a film production.

Although critics always question whether film awards reflect the consensus of representative cinematic achievement of filmmakers, film award categories indicate the creative contribution of major creative roles in the industry and by the public. Film awards and film festival ranging from small-scale independent to international prestigious, from western to eastern, from commercial to art house, such as Academy Awards Oscar, Emmy Awards, Golden Horse Awards, Cannes Film Festival, Berlin International Film Festival, and so on and so forth, there are a few conventional achievement categories: best actors, best director, best screenplay, best cinematography, best editing, best sound mixing, best production design etc. These categories suggest a way to appreciate and recognise the effort and contribution of major creative members.

From an occupational perspective, unionisation of film labour 'defines the divisional line between work functions and positions' (Bordwell, 1985, p.551). It not only functions as a labour pool for the productions, but also a protective bargaining body of labour. There are different institutional unions and guilds of different film departments across the globe, representing qualified directors, screenwriters, cinematographers, producers, art directors and so on and so

forth. Beside core creative department heads, assistants from different departments form their own unions, such as the union of assistant camera and lighting grips. These unions recognise and reassure the importance of each role in a film production team. In the meantime, unions consolidate the division of labour as well as a management hierarchy in the film industry.

All above-the-line and below-the-line crew members contribute to the profilmic event to different extents. However, in consideration that the profilmic event is the focal study subject in this research, collaboration around the camera is the key observation. Regardless of the industrial complex, there are a few absolute essential key roles in the profilmic event when completely scaling down the production scale to the smallest unit. Therefore, a few major crew members are selected in focus of this research - film director, screenwriter and cinematographer. Whilst some crucial roles such as producer, location sound, editor, production design and music composer will be excluded in focus studies at the moment.

2.3.1 Film Director

A film director is the creative lead of the entire production. They translate a screenplay to a film, to archive the suspension of disbelief, to make the film believable to the audience. They oversee all artistic and dramatic aspects, guiding every creative department, resolving possibly strongly contradicting ideas towards the identical vision from pre-production to post-production. A film director is expected to be capable of negotiating and mediating between the material reality and the creative vision; their decisions should be made to serve the storytelling with maximum available production resources.

Filmmaking is definitely not the director's one-person job. The name of a film director often appears on its own in the opening credits. The status and bargaining power of directors are being elevated by receiving the possessory credit 'A Film By ...'. Although other creative roles such as cinematographer and sound designer are as important as directing in terms of film aesthetics, a film director always has the ultimate decision-making power in most of the creative aspects. For example, prior to the digitalisation of filmmaking, the gaffer had the power to permit the recording of cameras because without enough lights, there would be nothing to be captured on the celluloid film. But the situation slowly changed when digital cameras were invented. The film director can overpower the cinematographer to command the recording of the camera, even when the framing or lighting is not perfected by the cinematographer or the gaffer.

Some scholars reject the idea of the director taking the top place of the production hierarchy or the centre of the production. Geuens (2007) suggests that *'the directors' job as a result was, for a while at least, reduced to activate the instructions contained in the script'* (p. 412). Sandeen and Compesi (1990) refer to certain television productions, *'Director is actually subordinate to the producers'*, who have *'a significant amount of input into the stylistic conventions'* (p. 169). A film director's *'direct control over style is limited to the elements of visualisation and direction'* (p. 168). Despite there are different hierarchical preferences, a film director has the overall control of all artistic aspects.

Film Director and the Conventional Profilmic Event

The major job responsibility of film directors on film sets is to focus on blocking of actors and directing their performance (timing of movement and pacing of dialogue, and emotional acting etc.) and giving instructions on *mise-en-scène* (action design, look and mood of the entire shot). They are responsible to adjust the performance from take to take, and decide whether the good take is achieved, and when to move on to the next shot. *Blocking* in the filmmaking context means where the screen actors stand and how they move around over the course of filming. Blocking is an important directing skill in spatial creation in film, it suggests the actions motivated reasonably without questions asked by the audience, it helps characters living in their situation and it keeps the cinema contained. Skills that a film director should equip with are not machine-related skills. Unlike a cinematographer who requires gears (cameras) to perform the task, a film director is relatively 'gearless'. Nevertheless, the technological

revolution of film had a great impact in directing practice, it enabled film directors to witness a digital representation of the objectivity of the world. Before the times that film directors were provided with a director's monitor, they had no possibility to look through the viewfinder during filming. Between takes, film directors had to go to the camera and look through the viewfinder, then go back to the profilmic event and talk to the actors. Their focus is actors' performances and their emotions instead of technical camera movements. *'What they (directors) must be sensitive to is the human intercourse at hand, the social space between people, the presence of objects as well as the flesh of the individuals'* (Geuens, 1996, p. 19). When there was the digital revolution of filmmaking where expensive film filmmaking has mostly been replaced by digital filmmaking, filmmakers have grown accustomed to relying more on digital screens. Geuens (1996) mentions the technological advances on *video assist*¹⁵ in a pessimistic way - *'as the "scene" became less and less accessible, directors had no choice but look at a remote image on a video monitor'* (p.25). Film directors no longer have to be physically close to the profilmic event, they can direct the scene isolatedly from a remote video village, a space where monitors are set up for real-time image and sound monitoring or playbacks in digital film practice. With the director's monitor situated between film directors and actors, the spatial relationship of film director and actors has changed. Without the director's monitor, the director and actors would be physically very close; with the director's monitor, they might be further away from each other.

¹⁵ Video assist is a system that displays the digital image that the camera is capturing. Back in the days when lighter and handy devices for real-time playback were not available, video assist operators (VAOs) were people who took the image generated by a film or digital camera and displayed them on a video monitor by using a video tape recorder (VTR). The job of a VAO is to help the director and other crew members to know what is being captured exactly.

Furthermore, film directors can constantly monitor the frame that the cinematographer is creating. They now have more input on camera work. It doesn't mean that film directors are paying less attention to actors, but now they have more control on other creative visions other than screen acting, including camera movement, the set dressing that are captured within the frame. A director's job is then to sign off the exact framing, the blocking of actors, basically everything displayed on the monitor. As the technology advanced, every detail can be magnified on the high-definition screen, screen acting became a screen-driven performing art, directors spend more time and pay more attention to every detail on actor appearances such their hair, makeup and costume to close-up shots in particular camera angles.

A film director leads a directing team consisting of *Assistant Directors* and *Script Supervisors*¹⁶, also known as *continuity*. It is common to see the assistant directors stay near the profilmic event to maintain the order instructed by the director while the director stays where the video village is, at a distance with the profilmic event. It is common to see that the director communicates with the assistant director via a walkie talkie. This spatial relationship is maintained as long as a film director gains support from the assistant director, the video village and walkie talkies.

¹⁶ Script supervisor is an on-set member in the film directing department whose sole responsibility is to oversee the continuity of every shot taken. A script supervisor closely communicates with actors, hair & make-up department to maintain the continuity. In some film cultures, a script supervisor is also known as continuity.

2.3.2 Screenwriter

A screenwriter writes scripts for screen production in the pre-production stage. They are the ones who transform conceptual ideas to a textual *screenplay*. According to *A Dictionary of Film Studies* (2 ed.)(Kuhn, Westwell, 2020), a screenplay is

a document setting out all the scenes, dialogue, and action of a feature film, sometimes including details of camera position, camera angle, shot size, and so on...A script comprises three main parts: slug lines, direction, and dialogue.

A screenplay is not only a 'film-to-be' format to tell a story, but it also functions as a manual of the production to other creative members to read, who encode the visual or audio language within their own professions. Amnon Buchbinder (2005) studies screenplays from a screenwriter's point of view in the book *The Way of the Screenwriter*, a screenplay is '*the point of intersection of three processes: storytelling, writing and filmmaking*' (p. 13). A screenplay acts as the blueprint in the pre-production, practically guides the budgeting throughout the production. It is a common practice to break down the screenplay into pages per shooting day. The screenplay breakdown then can be used to formulate a budget plan according to the number of shooting days and casts. According to a blog post on Studiobinder¹⁷, an online platform of filmmaking resources, major Hollywood films typically shoot only one page per day; Well-funded films often shoot 4 - 5 pages per day; Low-budget films may have to shoot up to 8 or more pages per day. There is another kind of script material called a *shooting script*, a ready-to-shoot script used in planning the making of a shoot. A screenplay and a shooting script

¹⁷Epstein, M. (2019, September 5). *Film Budget Planning: How to Effectively Budget a Script Breakdown*. Studiobinder.
<https://www.studiobinder.com/blog/film-budget-planning-how-to-effectively-budget-a-script-breakdown/>

are different format styles of a shooting script in different filmmaking cultures. Some are like a document compiled of a few scenes extracted from the screenplay, with details amended according to scenes that were shot previously; Some are annotated with notes for better assisting the on-set shoot, including planning related to props, complicated camera work, stunt work and special effects etc. Sometimes, a screenwriter may not take part in writing a shoot script that is heavily annotated with on-set instructions, which is usually formulated by the directing team, the producing team and the camera team according to the production needs.

'Although the writers' leadership in the making of the film did not survive the transition to sound, the notion of a universal writing standard for screenwriting did' (Geuens, 2007, p. 412). A standardised format of screenplay plays an important role as an industrial habitual communicating language. It ensures the efficiency and effectiveness of communication in coding the script- script writing and decoding the script - production planning. It facilitates the script development process especially when there is more than one screenwriter collaboratively co-write the script. Film industry practitioners have been benefited by the conventional screenwriting format.

A screenwriter may continue working on the script during the production stage. Sometimes, they may go on-location shooting to make immediate amendments to the script according to any changes on the spot. But mostly, the primary occupational responsibility of screenwriters is to deliver a screenplay in a conventional format for other creative members to plan the profilmic event in the pre-production.

2.3.3 Cinematographer

A cinematographer, also known as *director of photography (DOP)*, is responsible for the visual images. They are storytellers who visualise the story by directing the photography, which is designing and capturing moving images. Cinematographers work closely with the director, the *production designer* (art director) and the *gaffer*¹⁸ (who is the head of the lighting department) to achieve visual aesthetics. Although sometimes film directors give precise directions on the images, cinematographers have the overall control of the camera and lighting, they decide what to be seen within the frame. There are many camera and lighting techniques that a cinematographer employs to tell the story, including framing (composition), camera movement, choice of lenses, lighting mise-en-scène etc.

The cinematographer's input ranges from conceptualising the creative visual to supervising the technical aspect. In the technical and executive aspect, a cinematographer is the leading head of the camera, grip and lighting team consisting of camera operator, dollyman¹⁹, assistant camera, gaffer, *key grip*²⁰, *best boy*²¹ and *electrician* etc. The structure of these three teams depends on the extensiveness of the camera and lighting setups. When the team sizes are big, the cinematographer will give directions to the team leaders, and they will instruct the

¹⁸ Gaffer assists the cinematographer to work on lighting designs and to develop execution plans within the production budget. A gaffer is the head of the lighting department, who assembles the lighting crew.

¹⁹ Dollyman is a technician who operates the camera dolly and any tracking movements.

²⁰ Key Grip is in charge of rigging works, operates equipment and oversees all other grips. A key grip is a problem solver, he or she creates special rigs according to the cinematographer's need.

²¹ Best Boy is the assistant to either the Gaffer or Key Grip. The term is gender neutral, a best boy is responsible for arranging equipment and crew on a day to day basis.

subordinate assistants. For example, for some well-funded films, there will be one or more camera operators operating the cameras according to the cinematographer's instruction.

A cinematographer's work begins in pre-production, including location scouting, designing the shots with the director, deciding what equipment to use, working together with other creative department heads. On one hand, they prepare for the ideal images; on the other hand, they negotiate and compromise the reality, the production budget and schedule. Therefore, a cinematographer should be capable of both creative and practical skills.

Cinematographer and the conventional profilmic event

The on-location job tasks of cinematographers widely range from giving directions to the camera team, working on the lighting design with the gaffer, working on the mise-en-scène with the director and working on the set and props with the production design department. Framing is the primary job of a cinematographer, including deciding the camera position, camera angle, shot size and movement. They have the decision-making power to frame the scene and are responsible for the camera setups such as what equipment to be used and how the equipment is used. Different directors and cinematographers have different collaboration styles. In the aspect of creative work, some directors give directions on camera angle and shot size, and then the cinematographer will decide on the exact framing; some directors would rather focus on actors and let the cinematographer frame up the scene. In the aspect of execution, the cinematographer is the person who is in charge of the equipment usage of camera setups.

There are different rankings of *Assistant Camera* in the camera department to work on the setups. They follow the instructions of the cinematographer who is at the top of the hierarchy.

Furthermore, lighting design is also an important part of a cinematographer's job. A gaffer, the head of the electricians, oversees the execution of lighting, while a cinematographer is responsible for the overall lighting design. If the intensity of the available lighting is not enough for camera exposure or it is not ideal for the dramatic mood and tone of the image, lighting gear including film lights and other modifiers are used to alter the lighting. Since digital cine-level cameras are powerful in capturing in low-light environments, lighting setups could be minimal or extensive mostly depending on the artistic choice of the cinematographer and the gaffer. In between different camera setups, lighting setups are modified by the gaffer and electricians to accommodate and enhance the lighting effect according to different camera angles and frame sizes.

Since a directional camera is used in conventional filmmaking, cinematographers mostly pay attention to partial profilmic events which are the on-screen spaces. Although in some ways cinematographers utilise the off-screen spaces to tell the story, all decisions are made for the spaces within the frame.

2.4 The Profilmic Event and Production Spaces in Conventional

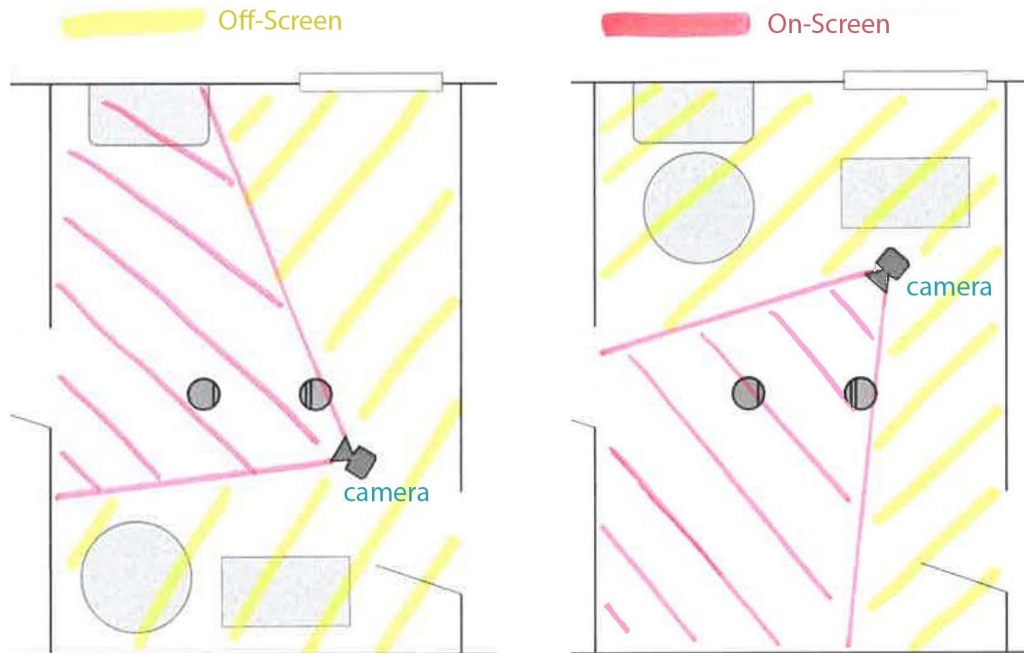
Filmmaking

In Howard Becker's (1974) 'Art As Collective Action', Becker proposes that a work of art is the result of collective actions, to understand the creative process one should study how the *network of people* make the collective activity happen and become routine. In film production as a collective work, to understand the on-location film practice, we have to study how film crews arrange the production spaces including the profilmic event. *Profilmic event* is a term used in film studies. David Bordwell (1985) defines the profilmic event as 'the action staged for the camera' in his article *Widescreen Aesthetics and Mise en Scene Criticism*. Bordwell uses 'profilmic event' as a term to differentiate between the filming event in phenomenal reality and the on-screen dramatic narrative which the audience will only see. A film director stages his 'reality'. Bordwell put them as two experiences that opposite each other - 'imaginative' opposed to the 'actual' life. Bordwell also argues that a film's idea is not revealed in the screenplay, but in the profilmic event, in which he called the filmmaking process in the profilmic event 'creating meaning from within the event'. In Bordwell's discussion of the role of widescreen cinema in scene aesthetics, the profilmic event is primary. In Bordwell's simplified definition of profilmic event, the camera is the critical condition of the profilmic event. The slice of the world is built for the camera. In conventional film practice, a directional camera is used for capturing moving images within a rectangular frame, which separates what is seen (on-screen) and what is unseen (off-screen). The on-screen and off-screen spaces give a zonal character of the conventional profilmic event. Illustrated in Figure 6, when the camera is

re-positioned between different setups in the same location setting, the on-screen and off-screen spaces change along the camera position. Due to the mobility of the camera, these zonal spaces overlap each other according to camera angle. In other words, the zonal profilmic events overlap along with different camera setups. This is a simple illustration of how the camera angle dominates the profilmic event.

Figure 6

Zonal Character in Conventional Profilmic Event



Note. Two camera setups in the same location. The camera angle divides the location into two spaces - off-screen space and on-screen space, which gives a zonal character.

Extending this simplified definition of the profilmic event, there is another exhaustive explanation of the profilmic event in *A Dictionary of Film Studies* (1 ed.)²²:

The slice of the world in front of the film camera; including protagonists and their actions, lighting, sets, props and costumes, as well as the setting itself, as opposed to what eventually appears on the cinema screen. In studio-made fiction films, the profilmic event is a set constructed for the purpose of being filmed.

The film image is bounded by the sides and by the upper and lower edges of the frame, inside which only a portion of the profilmic event, whether a studio set or a location setting, can be seen. (A Dictionary of Film Studies (1 ed.))

²²

<https://www.oxfordreference.com/remotexs.ntu.edu.sg/view/10.1093/acref/9780199587261.001.0001/acref-9780199587261-e-0561?rskey=7IUn76&result=561>

In the sense of the spatial usage of a film production unit, the profilmic event is not only the action staged for and in front of the camera, but also the physical spaces and other materials within the space created for the frame. This definition of profilmic event seems contradictory, as both on-screen and off-screen spaces are included. The profilmic event is not only what the camera can see, but is camera-driven, it includes sets and props which contribute to the image in one way or another. Not only sets and props these physical properties contribute to the visual, film crew is also another entity constituting the profilmic event. In conventional film sets, it is common to see on-set crew members standing around the filmic set, ready to be called for any instant change, such as make-up artists stand by for quick touch-ups of actors; props assistants support set dressing resets between takes. Sometimes, the profilmic event is further expanded to the spaces where the film is working. For example, when a clean background without passing-by pedestrians or vehicles is required, production assistants (PAs) will block the traffic. Thus, the profilmic event is further expanded to the spaces where the PAs are located. All in all, the profilmic event is not a scholarly term of the 'on-screen' space but a cohesive idea of a film set. Some refer the profilmic event to pro-filmic space, which might mislead the understanding of the profilmic event as an equivalent of the film set. However, a film set is not an exact physical representation of a profilmic event. The profilmic event is the space serving the camera frame on the film set, including the lights that are off-screen. The profilmic event could involve the entire film set, or just a part of the film set, according to the camera angle (see Figure 7 & 8).

Figure 7

The Profilmic Event on a Conventional Film Set (Scenario A)



Figure 8

The Profilmic Event on a Conventional Film Set (Scenario B)



While there are two different definitions of the term profilmic event, the spatial practices in filmmaking are in the interests of other scholars. Although film production scholar John Caldwell does not use the scholarly word profilmic event, instead 'geography' is used in his book

Industrial Geography Lessons. By looking into the meanings of 'production geography', the profilmic event is interpreted as *deep industrial text* in his studies on the critical spatial practice. Caldwell (2004) articulates that space in film and television filmmaking is more than a physical presence of a production unit or where a film production takes place. Instead, it is

...a highly codified arena for status ranking and a public-private rhetorical construct used by practitioners to reflexively make sense of both the creative task and the ever-changing industrial landscape (p. 163).

Caldwell addresses that studying the production spaces including the profilmic event is crucial, because it is where part of the social meanings of filmmaking is. It implies the tier competitions amongst film crews.

In the practical perspective, in both definitions of profilmic event, it plays a critical role in filmmaking practice through the production. In pre-production, after the major creative members have conceptualised the story, they have to plan and map out the execution of the profilmic event. Technical crew members take the responsibility to 'construct' the profilmic event. Film production either builds and manufactures the film set from scratch, or they modify the location through film lighting and set dressing (production design) to obtain an ideal filmic space. The zonal profilmic event dominates the spatial relationship on a film set, the relationship between the profilmic event and other production spaces such as holding areas for equipment and video village. For example, when the bedroom is being filmed, the living room can be used for the video village (director's monitor); in reverse, when the living room is being filmed, the video village (director's monitor) can be in the bedroom (see Figure 7 & 8). Another example, when the action involves a wire-flying which requires a wire system, the rigging takes

up spaces which were previously occupied for equipment temporary storage, the equipment will then be moved for the stunt team. Different spatial relationships are formed by different profilmic events accordingly, which are manipulated by the camera angle. Due to the high mobility of the camera and the profilmic event, the spatial practice of conventional film sets is highly flexible. In other words, flexibility is the spatial routine of a film set.

3. Methodology

Compared to academic studies and theorising research, film production studies is not a discipline that takes place through logically argued written texts. Renowned film production studies scholar John Thornton Caldwell (2008) has provided scholars with a comprehensive demonstration and a framework for film production studies in his book *Production Culture: Industrial Reflexivity and Critical Practice in Film and Television*. In Caldwell's journey of finding the 'authentic' reality 'behind the scenes', 'what film production means' is 'highly coded, managed and inflected'; The 'knowledge' of the film productions is embedded deep texts' in the academic context. The fully embedded deep text is *'largely cut off from the public and are commercially enacted or circulated by production personnel within the relatively bounded, propriety worlds of work'* (p.346). What happens on set - production practices and cultures - is not often opened to and attained by non-filmmakers, including academic scholars. Although there are making-of photos and videos which are captured during the shoot and will be released to the public, but those making-of materials are filtered and edited, they don't truly reflect the production. In the perspective of academic studies, there is no one to keep recording and translating the entire cultural practice into materials for researchers, nor can they get the full picture of on-location shooting from close reading of behind-the-scenes materials. For researchers lacking direct access to production sites, the difficulty of getting any insights about *'what is going on in the production process'* is highly problematic (Brunn, 2016, p.137). However, difficulties in attaining the production information by written text do not deny the accessibility to the knowledge, Caldwell proposes and has demonstrated a few methodologies

to perform production research, including ethnographic fieldwork, analyses of technology and trade artefacts, practitioner interviews, and interactions with practitioners as part of staged personal discourses and Q&As. The more common research methodologies such as textual analysis and economic analysis are being considered as 'disconnected methods' in Caldwell's book. In this research, interviews with practitioners and ethnographic fieldwork will be extensively adopted to obtain the 'deep' text, rituals and spatial relationship in cinematic virtual reality production.

In order to explore the film practices of cinematic virtual reality production, I have conducted a fieldwork-based self-ethnography that includes on-site observing participation and in-depth interviews with CVR crew members as my primary source. I have also reviewed scholarly published literature about film production as my secondary source.

Self-ethnographic Fieldwork

Ethnography that I deployed in this research is different from the usual ethnographic research in other disciplines like anthropology where researchers' personal experiences compose the starting point of and are used as the central material of the research study. My ethnography is self-ethnographic (autoethnographic), in which my own filmmaking experiences are part of the data collection in this research. In Caldwell's definition, filmmakers are self-ethnographic, they do not have to start a research study to be self-ethnographic, they daily deploy academic theories into industrial practices. I have been working mainly as an Assistant Camera for 5 years since 2018. My own filmmaking experiences in conventional filmmaking range from low-budget

indie short films produced in Hong Kong and Singapore, to well-funded Hong Kong action feature films produced in Hong Kong. Although my ethnographic participating observations are limited to the film industries in Hong Kong and Singapore, the understanding of general film practices of conventional filmmaking is adequate for this research purpose, in which the detailed cultural differences of different productions across countries are not required in this study. For well-structured feature-length movie productions, I participated in the shooting as an Assistant Camera. For smaller-in-scale film productions, I experienced as a cinematographer or a gaffer often from pre-production to production. I only professionally work in the camera department but not the directing department nor screenwriting team, yet, as one of the film practitioners in the industry, we share the knowledge of how a film is properly produced across departments. However, coming from a conventional filmmaking background, I was lacking first-hand experiences in cinematic virtual reality production by the time this thesis was written. When this research started, on-site fieldwork to CVR productions was not allowed due to the inactivity in the Singapore film industry caused by Covid-19 pandemic.

As an observing participant in conventional film productions, I observed the on-location shooting practice while I worked as a crew member on conventional film sets. My observation includes the division of labour, the shooting workflow, the spatial usage of film sets, the verbal and nonverbal communication amongst crew members including myself to explore the relationship between distinctive roles as well as the production practice. Self-ethnographic fieldwork is subjective in nature. According to Dr. Jan Blommaert and Dong Jie (2010) states in their book *Ethnographic Fieldwork : A Beginner's Guide*, 'It [ethnographic fieldwork] will be

interpretive research in a situated, real environment, based on interaction between the research and the subject(s)' (p. 17). It is called *uniquely situated events*. I am aware that I am dealing with a reality that will never be repeated. Yet, this research is not based on a few observations, the self-ethnographic study is a long-term and on-going reflection of my own filmmaking experiences.

In-depth Interview

'Possessing previous professional experience in the field of media production is practically useful and methodologically important' (Caldwell, 2009; see Munnik, 2016). As I was lacking first-hand experiences in cinematic virtual reality production by the time this thesis was written. Interviewing professional filmmakers was a method to fulfil the research needs, as well as obtaining a qualitative overview of the film industry. In-depth interviews were conducted with filmmakers who professionally work in both conventional film production and CVR production. The selected filmmakers had experiences from different productions of various scales, budgets, cultural and social settings. 6 out of 5 of the selected interviewees are the director (or director/writer) of their CVR production, only one of them is the writer. It is not my intention to neglect cinematographers as interviewees. No CVR cinematographer was available for the interview upon my invitation. Additionally, it is a phenomenon that the role of cinematography is often being taken up by other creative members like the director or the 360 camera technician.

The interview was approved by NTU Institutional Review Board (NTU-IRB) on 17 February 2022. The NTU-IRB reference number for this study is IRB-2021-562. The interviews were conducted with the provision of an interview guide. The interview guide was in the form of open-end questions that solicit filmmakers' ideas. The interviews were conducted online through meeting platform Zoom, and were recorded and transcribed for analysis. The selected interviewees are as follows:

1. Director HUANG Dan-Chi 黃丹琪 and Director Morgan Ommer

CVR project: *Madame Pirate: Becoming A Legend* 女海盜：成名之路

180-degree, non-interactive, fiction, mixed with live-action and animation

Duration: 17 minutes

Release Year: 2021

Madame Pirate: Becoming A Legend is a 180-degree CVR co-directed by Taiwanese Director HUANG Dan-Chi and French Director Morgan Ommer. It is a combination of half live-action and half animation CVR that recreates the legendary story of CHING I-Sao, the notorious 19th century female pirate in Asia. *Madame Pirate: Becoming A Legend* was selected for the Kaohsiung Film Festival 2021. Both directors are from conventional filmmaking backgrounds.

2. Director & Writer Milad Tangshir

CVR project: *VR Free*

360-degree, documentary

Duration: 10 minutes

Release Year: 2019

Milad Tangshir is a documentary director from Iran. *VR Free* (2019) is his first CVR documentary. *VR Free* (2019) portrays some fractions of life in Turin Prison and captures the reactions of a few inmates when they experience some immersive videos of life outside of the prison, which are some collective or intimate situations that are no longer within their reach. *VR Free* (2019) was the winner of 360° Cinema in 2020 Aesthetica Short Film Festival and the winner of Competencia VR in 2019 BOGOSHORTS Bogota Short Film Festival, and was nominated in many other VR film festivals. *VR Free* (2019) was filmed by a 360 camera in the actual Turin Prison.

3. Director & Writer HO Wi-Ding 何蔚庭

CVR project: *Look At Me* 看著我

360-degree, non-interactive, fiction, live-action

Duration: 14 minutes

Release Year: 2019

Director Ho Wi-Ding is a Malaysia-born Taiwanese film director. *Look At Me* (2019) is his first attempt at CVR storytelling. *Look At Me* (2019) is a sci-fi 360-degree CVR that portrays Zhang, who failed rendezvous with his virtual-world-addicted girlfriend,

suffered from cybersex and chose for a physical fight engaging ‘real interactions’ in the end. *Look At Me* (2019) was selected for the 2020 Festival de Cannes Marché du Film, 2020 SXSW Film Festival and 2019 Kaohsiung Film Festival. *Look At Me* (2019) was filmed by a 360 camera.

4. Director & Writer Alexey Marfin 馬樂思

CVR project: *Kowloon Forest* 靜觀九龍

360-degree, non-interactive, fiction, a mix with live-action and computer-generated graphics

Duration: 8 minutes

Release Year: 2019

Alexey Marfin is a professional visual effects artist based in the US and Hong Kong.

Kowloon Forest (2019) is his first CVR directing work, which is a portrayal of the private lives of five strangers in Hong Kong, exploring the intimacy moments in a city of density.

Kowloon Forest (2019) won the Best Live-Action VR Film in the 2020 Vancouver Film Festival and was selected in the 2019 Kaohsiung Film Festival XR Dreamland and 2019 Busan Film Festival. *Kowloon Forest* (2019) was filmed by Black Magic Pocket Cinema Camera 6K. The live-action footage was mixed with computer-generated graphics.

5. Director Josema Roig & Writer Joshua Rubin

CVR project: *The Argos File*

360-degree, non-interactive, trailer, live-action

Duration: 3 minutes

Release Year: 2017

The Argos File (2017) is a 360-degree CVR trailer for an interactive VR video game directed by Josema Roig, which integrates cinema-quality visual effects and 360° stereoscopic live-action footage. *The Argos File* (2017) won the prestigious Proto Award for Best Live Action Experience and was selected in multiple film festivals. The trailer is extracted from the first chapter of the VR video game, which was written by Joshua Rubin, a veteran in screenwriting before becoming a video game writer. *The Argos File* (2017) was filmed by a 360 camera. According to Director Josema Roig, it was the first CVR that contained camera movements done by a 360 camera.

(The interviews were done separately.)

Secondary Sources

To acquire knowledge of previous research questions and the research gap in this field of study, both classical and contemporary academic work done by significant scholars were further studied as reference. Classical literature such as production studies by John Caldwell, Hollywood film production studies by David Bordwell were studied; contemporary literature written by important CVR researchers such as John Mateer, Kath Dooley, Maria Cecilia Reyes, Ruth Aylett, Sandy Louchart were studied.

The majority of the available scholarly published literature about cinematic virtual reality focus on the screen grammar and film language; there is relatively less research about the production culture. Scholarly publications are fairly limited and quickly become outdated as filmmaking technology rushes forward. At the same time, online journals, articles and magazines reflect the latest developments. Therefore, online resources were consulted.

4. Observation, Analysis and Findings

4.1 Observation of the Occupational Role in CVR Production

David Bordwell proposes that achievement awards are reflective of the creative contribution and the mode of production in the film industry. Starting from the first Academy Award (Oscars 1927/28), there were not only the Outstanding Picture or Best Picture, but also different awards dedicated to different creative departments, such as Best of Directing, Writing (Original Screenplay and Adapted Screenplay), Cinematography and Sound. Despite many important roles not yet being categorised in the Academy Award, film awards recognize accomplishments of the major creative roles in a film production. In comparison to cinematic virtual reality, the maturity of public and industrial recognition of CVR productions is lower. In the past virtual reality film festivals, film awards were categorised independently and dedicated to the genres of immersive content. For example, there were Best Animated Experience, Best Live Action Experience and Best Interactive Experience. However, awards for CVR major creative roles in different departments are not yet categorised. What the industrial phenomenon in the CVR 'industry' suggests is not the insignificance of the work of CVR filmmakers, in contrast, it urges the industry and scholars to recognise, appreciate and respect the individual occupational roles in CVR productions by understanding the job responsibilities amongst production personnels and the workflow on film sets.

4.1.1 CVR Film Director

Imagery expansion from widescreen *CinemaScope*²³ to frameless has many inevitable fundamental changes in directing. Scholars have been theorising the new directing and storytelling techniques that needed to be adopted in directing CVR. Tricart (2017) proposes three objectives of CVR which allows it to become a special storytelling medium over other art forms: immersion, presence and embodiment, regardless of the interactivity. These new attributes are CVR directors have to deal with in order to make use of the medium. The occupational role of a film director is reconstructed by the expanded profilmic event. CVR directors have different job tasks from conventional film directors. From pre-production to on-location shooting, CVR film directors have to abandon some practices that are long-established in conventional filmmaking. They are required to be equipped with new creative and directive skills that compromise the full spherical filmic space and the profilmic event.

Location scouting in the filmmaking context refers to finding a suitable filming location, which is an important task of the producing team in the pre-production stage. Depending on production budget and crew structure, in some circumstances, film directors have the decision-making power to determine the shooting location according to their creative vision. They are responsible for balancing between creativity and feasibility. In

²³ CinemaScope is an anamorphic process that compresses an image during filming and uncompresses it when it is being projected, the aspect ratio could be as wide as 2.66:1, which was then reduced to 2.35:1 and became the most common aspect ratio of mainstream movies nowadays.

conventional filmmaking, it is a consensus amongst all filmmakers that a location doesn't have to be perfectly suitable for shooting at all angles. When doing location scouting, film directors only look for certain angles of a location that are 'film-able', which will be divided into partitions of profilmic spaces and the unfilmed spaces, allowing some spaces to remain unused and unseen. In other words, the rectangular frame allows film directors to work on an imperfect location. On the contrary, when CVR directors are deciding shooting locations, they find it hard to divide the location into partitions or isolate some parts of it. They have to take the entire place into consideration regardless of the capturing angle of the camera (180 or 360 degrees) and shooting methods (shooting quadrant by quadrant or at all 360 degrees at once). Alexey Marfin has the same idea of CVR location. When Marfin directed his first cinematic virtual reality *Kowloon Forest* (2019), he used a regular digital camera Blackmagic Pocket Cinema Camera 6K with fisheye lens to shoot different quadrants separately, he then stitched the footage and some computer-generated materials together into a virtual reality spherical imagery. Marfin mentioned in the interview that he had a tougher selection of filming locations even though he was not filming the entire space, but he still had to find locations that work in multiple directions. The holistic aesthetic cohesiveness of the location became a concern of CVR directors. Especially when an omnidirectional camera is used, it is not feasible to use the unfilmed space to dress up the profilmic spaces like how the conventional film directors do. Therefore, accurately choosing the correct location with the original characteristics becomes a critical task of CVR directors.

Another major job task of CVR directors in the pre-production stage is *casting*, the process of selecting the actors who can most convincingly bring the character to life. For some well-funded and well-structured film productions, casts are decided by the following two roles: the executive producer and the casting director. When the star cast is a critical key to the capital and public attraction, the executive producer has the power of deciding the 'money-cast', and for the rest of the cast, there is a casting director to be in charge of the rest. Different filmmaking modes of production have different casting approaches, the Hollywood studio system is star-centred while the European filmmakers emphasise on auteur cinema. Other than the executive producer and casting director, in any type of mode of production, usually the film director is the one to conduct the audition. In conventional filmmaking, actor performance is framed and intercut into shots. The collaborative work of film director, cinematographer and editor guides the audience to see the actor's performance. Conventional casting is based on this attribute of *screen acting*.

In CVR, the screen acting is different from the conventional screen acting. Other than that CVR empowers viewers to choose their point of interest, which allows them not to look at the protagonist but also other casts or even the background actors. The former Head of Casting of Mike Lemon Casting which has cast over a thousand award-winning films, television shows and commercials, Melanie Forchetti has cast for one of the first feature-length CVR called *Career Opportunities in Organized Crime*. After the experience, Forchetti has compiled some of her thoughts about CVR screen acting in her online article

*What You Need to Know About Acting + Virtual Reality*²⁴ - any performer in the scene may be the centre of attention. This attribute of CVR would not completely obliterate the difference between main cast, side cast and *extras*, but brings extra qualities that a CVR actor should be equipped with - capable to be in character at all times. And the insight of such changes for CVR directors lies in the changes of casting and directing. CVR directors no longer only look for actors who can act for the camera, but to act with his or her entire body in a space. Director Alexey Marfin used the 'real life' approach in CVR casting. Marfin interpreted conventional screen acting as 'specific performance' because it is performed for cinematography within a specific rectangular frame. Marfin's idea of casting for *Kowloon Forest* (2019) was developed from the inability to control the audience where to look in the full spherical imagery. Marfin believes that an overall portrayal of the character and the filmic world is more important than getting a 'specific performance' from actors. In order to establish a more realistic and authentic character, he tried to find actors who have similar real-world experience to the characters. In *Kowloon Forest* (2019), the actor who played the astrologer is a South Indian spiritual teacher in real life, same as the story character. All the costume outfits he was wearing were his own outfits; his performance in the prayer scene was directed by the actor himself, according to his own real-life experience. Marfin pointed out that CVR casting is '*more like making sure I get the right person, who can then develop this more holistic world for the acts.*' To a certain extent, acting in front of the 360 camera is dissimilar to conventional screen acting, because wide shots are mostly favoured in CVR, CVR screen acting requires head-to-toe input, which

²⁴ Forchetti, M. (2020, April 16). *What You Need to Know About Acting + Virtual Reality*. Backstage. <https://www.backstage.com/magazine/article/acting-world-virtual-reality-1555/>

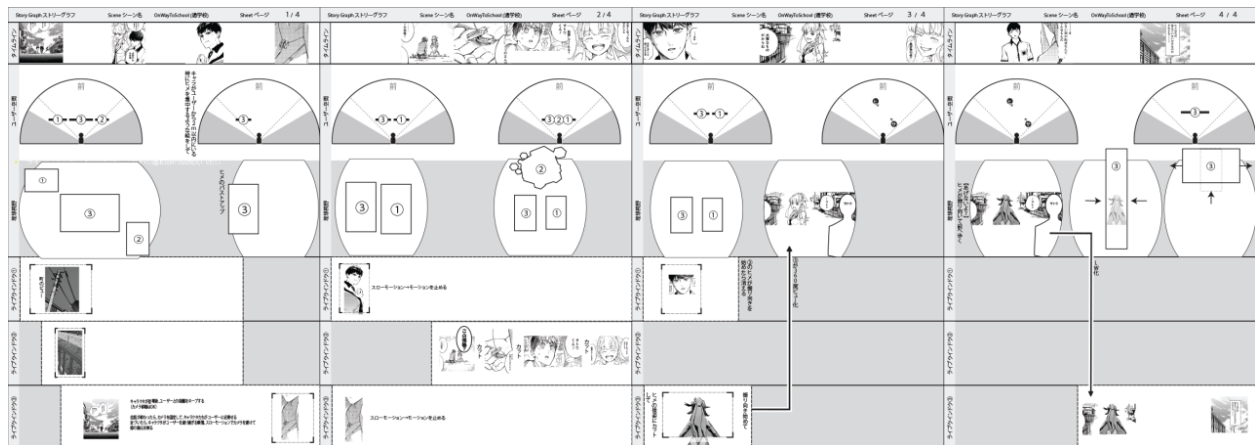
resembles stage acting in theatre. Director HUANG Dan-chi has the similar idea of relating screen acting to theatre stage acting. In her experience of directing *Madame Pirate: Becoming a Legend* (2021), getting theatre actors is a benefit because they are used to acting with their whole body and used to a huge amount of rehearsals.

Before the actual shoot, some film directors would prepare a set of shot lists and storyboard as a visual guidance throughout the shooting process, in which the shots are listed in a textual form or drawn out to indicate visual direction such as shot size, camera movement and mise-en-scène. In well-funded and well-structured film productions, especially for animation and commercials, a storyboard artist is in charge of storyboarding. For all kinds of budget-scales of live-action film productions, it is a common practice for film directors (and cinematographers) to formulate the storyboard by themselves. Although at this point of time, there is no standard format for both shot list and storyboard in the industry, there are many available templates shared by the practitioners. However, CVR filmmakers find those templates not quite applicable in CVR production. CVR are usually shot with wide lenses with very limited camera movement. With lesser choices of shot size and camera movement, the way to communicate visual directions are different from the conventional shot list and storyboard. Different CVR filmmakers have their own documentation styles to substitute the conventional storyboard. Taking the 'storyboard' of the VR video game *'Tales of the Wedding Rings VR'* as an example. Although it is not a narrative cinematic virtual reality, the 'storyboarding' is still relevant to this research as it is dealing with the 360° space. VR Developer Matthew Hope has designed his own graphics which he called 'storygraph' to document the visual direction. The 'storygraph' is in a

‘tracks’ format with a timeline on the X-axis (see Figure 9). Each track represents different visual information in relation to the movie timeline, such as the overhead circular representation of the 360-degree space showing the spatial relationship, ideal user field of vision per design intent, action placement and transitions. Meanwhile, some CVR filmmakers prefer to use a bird’s-eye view floor plan to share the vision with other creative members. Yet, the floor plan for CVR is unlike the regular architectural floor plan, usually it is a circular diagram that visualises the horizontal 360 degrees of the shots, showing the action placement, mise-en-scène and the spatial relationship amongst all actions from a top-down angle.

Figure 9

‘Storygraph’ designed by Matthew Hope



Note. From VR storyboarding: a native approach [Photograph]

(<https://www.mlhope.com/post/181042427023/vr-storyboarding-a-naive-approach>).

During the on-location shooting, in consideration that the CVR profilmic event expands to the ‘surroundings’ of the camera/viewer, CVR directors no longer stage action for a rectangular

frame, they have to take the entire full sphere into consideration for mise-en-scene. To deal with a spherical image, CVR directors do not only block the scene in a larger space, but to make use of the enlarged filmic space to serve the storytelling purpose. The frameless spherical field of regards (FOR) increases the overall narrative capability, enabling multiple points of interests (POIs) simultaneously. CVR is capable of giving birth to multiple narrations at the same time. When two important POIs are too far apart from each other that require head movements to switch attention in between, it is hard to expect viewers to change their POI between multiple POIs at the right moments. A test done by Gödde, Gabler, Siegmund and Braun in 2018 has proven that if the creator wants more than one simultaneous POIs to be viewed correctly at the right moment, they have to be positioned within the field of view (FOV) of the head-mounted device. Some CVR directors will make use of this inability to watch all actions at once to serve the storytelling purpose, guiding the audience into a particular viewing experience. Director Josema Roig and Joshua Rubin mentioned that the idea of their not-yet-produced CVR video game is to place multiple actions in different quadrants intentionally; the video game is aimed to require players (viewers) to rewatch the clips when they realise that they have missed some narrations. On the other hand, in order to create a juxtaposition of different actions, some CVR directors prefer having two actions within the FOV of the audience. There is a scene in *Look At Me* (2019) where two key narrations happen simultaneously on different sides of the camera/viewers. Director HO Wi-ding has intentionally staged the two actions at the two left and right edges of but within the FOV of the audience, because he wants the actors to look far apart enough but being seen at the same time. Multiple-narration is one of the storytelling techniques that CVR directors can adopt.

How to navigate the gaze and attention of the audience is not just simply creating POI and positioning them, instead it is a skill of understanding human perception. Conventional films engage the audience to the story from a safe distance, while CVR audiences may find themselves existing or witnessing in the story space, participating as one of the characters or even the protagonist when the CVR adopts a first-person storytelling technique. As the relationship between the audience and the story characters in CVR differs from conventional films, the emotional journey is significantly different. As CVR images fill up the entire view of the audience, it affects how they perceive the virtual world. The audience is not only seeing what the camera is seeing, but also feeling the space around the camera. It is the unique perceptive characteristic of immersive media called *proxemics* - the amount of space a human feels is necessary between themselves and others. Due to proxemics, CVR directors have extra responsibilities of taking care of the distance between the camera and everything in the profilmic event, especially the distance between the camera and actors, as it critically affects how the audiences feel about the relationship they have with the story characters. Conversely, CVR directors may make use of proxemics to create dramatic tension to serve the storytelling purpose.

At the current point of technological and aesthetic development of cinematic virtual reality, choices of camera work are not as diverse as conventional cinematography. Due to the spherical visual of the medium, wide shots are favoured and lens choice is limited. Due to the possible motion sickness of watching on a headset, moving shots are not as common as conventional

films, thus, most shots in CVR are static shots. In short, CVR cinematography and screen grammar are relatively less complicated and subjective compared to conventional cinematography. Therefore, CVR directors have to have a different approach when designing the mise-en-scène. For example, CVR directors have to block the actions in different ways to achieve close-up shots. They can direct the actors to bring the props closer to the camera, so the audience can see the details. However, there is a technical limitation of 360 cameras which refrains actors and objects from being too close to the camera called safety stitching distance. Due to the *parallax* of two lenses, there is a minimum distance that an object can go near a 360 camera for a proper stitching. Director HUANG Dan-chi said that, for *Madame Pirate: Becoming A Legend* (not-yet-released), they did camera tests on actions at different distances away from the camera to find out how far the actors have to stand to obtain the best image quality. 360 cameras' ability is one of the factors affecting how CVR directors design the mise-en-scène. To adapt to the new medium, CVR directors have to conduct more technical tests and rehearsals prior to the actual shoot. CVR directors can also deploy other image and sound elements as mise-en-scène to replace close-up shots, such as designing lighting or some sound effects to guide the attention of the audience.

A film director is responsible for determining whether the *take* is good enough to move on to another shot. In the era of film cameras, before video assist was invented, film directors were used to monitor actor performance and blocking by looking at the profilmic event. Since video assist was invented after digitalisation, film directors are used to heavily relying on the digital images displayed on the director's monitor. Other than actor performance, there are a lot of

on-screen details that a film director has to sign off on, such as shot size and details of mise-en-scène. However, CVR playback technology is not as mature as conventional filmmaking (which will be further discussed in chapter 4.2), CVR directors use different means to monitor the shot, and yet the supervision is limited. When a 360 camera is adopted and when all quadrants are being shot at once, the option for CVR directors to monitor actors' performance in real life in the profilmic event is not possible. There are a few ways to watch playback of CVR. CVR directors can either look at a portion of the entire 360-degree image on a flat screen, scrolling the image to change the viewing angle, or looking at an equirectangular image on a flat screen. Both playback methods are not close to the true viewing experience on a headset. It requires extra imagination and time from CVR directors to make adjustments for the next take or to determine a good take.

CVR as a new storytelling format in filmmaking has led to new directing practices from pre-production to on-location shooting. The occupational role of a film director in CVR filmmaking is different from a conventional director, which is reconstructed by the expanded profilmic event and the current technological development.

4.1.2 CVR screenwriter

While a film director has to go through a lot of occupational changes in filmmaking practices from pre-production to on-location shooting, CVR screenwriter's responsibilities mainly remained within the work of scriptwriting, to write a story in script format. But there are new challenges for CVR screenwriters in outputting a screenplay. Since the conventional standardised screenplay format is designed for films with a frame, theoretically it can merely be directly adopted for frameless cinematic virtual reality. Therefore, CVR screenwriters self-design their own format according to their production needs. Some find the need for a 'spatialised' script due to the expanded 360° field of view. *Filmatics*, a production company, divided the filmic space into quadrants and designed a colour-coded script for their CVR called *Eye for an Eye*. Each quadrant is assigned to one colour for easily choreographing eyes during reading. Their idea is to get the filmmakers to experience the work before they shoot a frame. This template was publicly shared on *No Film School*, a popular filmmaking website, and was then adopted in a student project in UNCSA's School of Filmmaking (see Figure 10). The script is written in normal paragraphing, yet the texts are in 6 different colours according to the 6 planes - front, back, right, left, up and down, so it can be identified easily.

Figure 10

The 6-planes Colour-coded CVR script from a student project in UNCAS's School of Filmmaking

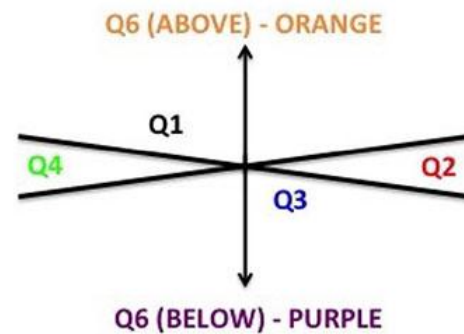
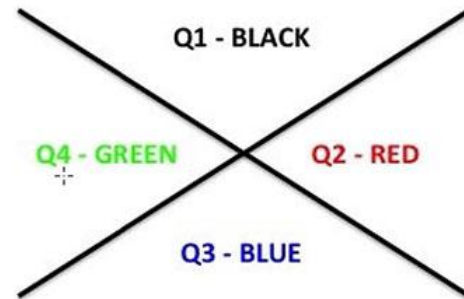
INT. VOID - NIGHT

The Experiant notices a 3D neon title floating in a void:
SLAM. The title grows brighter then floats away as A
SINGLE narrow beam of light slashes across the darkness
in front of us -- reminding us we're not blind --

An ETHEREAL SHIMMERING sound from above and --
WOOSH -- THE BEAM slides right and swells into a
spotlight that SWINGS around behind us and
eventually finds -- THE POET, standing some distance
away, turned away, inhaling, exhaling.

The Poet takes a breath, opens her eyes, makes eye-
contact with and AN UNSEEN AUDIENCE MEMBER
somewhere in the void in front of her.

POET
I know I made you upset
but please—
don't walk out on me.



Note. From 5 ways virtual reality is flipping the script on screenwriting [Photograph]

(<https://www.uncsa.edu/news/20170307-virtual-reality-screenwriting.aspx>).

Other than this colour-coded format, existing research studies reflect the current tendency in the industry of using hybrid scripts that include diagrams and tables over the text-alone script format. Director Alexey Marfin wrote the screenplay by himself for *Kowloon Forest* (2019), in which he refers to as a combined script that consists of three elements - textual descriptions of characters, visual references and floor plans of each scene. Firstly, the textual script is not the voice over in the film, it is the description of the internal thoughts of the character. It is to help the actors to understand their character better. Secondly, there are images selected to visualise the description of characters and to enhance actors' understanding towards their character. Thirdly, the top-down view floor plans were drawn to give concrete ideas of the position of the camera and actors, it was to manifest the axis of each scene and how they related to each other between shots. Celine Tricart writes the book *Virtual Reality Filmmaking* to teach the production of CVR, a table format of 4-column layout of screenplay is introduced, each column specifies left, right, front and back respectively (see Figure 11).

Screenwriter Richard L. Davis evokes the possibility of 'constructing' a CVR script by using a game engine which can incorporate elements of *previs (previsualisation)*²⁵, the process of visualising scenes before filming. With the help of software such as Google's Tilt Brush and Mindshow, CVR screenwriters can directly create the script in three dimensions, or even design a mock-up scene with action and dialogue in a virtual environment. The asset may help to raise money for the project as well.

²⁵ Previsualisation, often called 'previs', is a process of creating material that portrays the visual ideas before the actual shoot, such as illustration, photographs and animatics.

Figure 11

4-Column Table Format

LEFT	FRONT	RIGHT	BACK
INT. ATTIC - DAY			
and a mirror covered in dust. Michael sees something in the mirror's reflection. He takes a deep breath and wipes the dust with his hand revealing... Michael jumps. MICHAEL Who are you? MICHAEL (CONT'D) Come on! I saw you!	The door opens with a long, scary creak. Michael steps in and looks around. Nobody's there. They exchange smiles and awkwardly shake hands.	He removes some of the sheets covering the furniture: a weird and scary painting. Alice looking at him from behind the closet. Alice hides behind the closet. Alice steps out of the shadows and looks at Michael with apprehension. A beat. ALICE I'm Alice.	an old armoire

Note. From *Virtual Reality Filmmaking* [Photograph]

Some screenwriters still prefer to use the conventional screenplay format, but it depends on the linearity of the CVR. Joshua Rubin, the writer of *The Argos File* (2017), said that the script was written in a textual form on *Final Draft*, the industry standard screenwriting software. Rubin mentioned that the script is similar to a conventional screenplay because it is a textual description of the place where the characters are in. In Rubin's script, he does not describe what was happening on different quadrants, like the left or right of the camera/viewer, but instead, he describes the whole world and the central actions. Rubin

explained that it is because *The Argos File* (2017) is a linear trailer of a video game, there are only the central actions but not multiple actions happening at the same time. Rubin mentioned that in the later nonlinear episodes where multiple things will be happening in different quadrants of the full sphere simultaneously, a script in other formats such as graphical form or table-form may be needed to visualise the multiple actions.

Finally in 2018, an officially formalised screenplay format *Immersiveplay* created by award-winning immersive storyteller Evette Vargas was made available to the public on *Final Draft*. *Immersiveplay* encompasses both interactive or non-interactive immersive media, including CVR. Unlike the conventional screenplay format that contains 6 formatting elements - the slug line, a description of the action, the name of the character, parenthetical remarks, the dialogue and transition (see Figure 12), *Immersiveplay* contains more elements such as SFX, viewer POV, mini-slug and interactivity (see Figure 13).

Figure 12

6 Formatting Elements in a Screenplay



Note. From *Building Your Script* [Photograph]

(<https://courses.vrta.academy/lessons/building-your-script/>).

Figure 13

Immersiveplay

	TITLE: The gladiator
SFX	PRE-LAP SFX: <i>Incongruously enough, the first sound we hear is a beautiful tenor voice. Singing. A boy's voice.</i>
TRANSITION	FADE IN.
VIEWER POV	VIEWER POV: The camera with an eye line of 70" from the ground.
THE SCENE HEADING OR "SLUG LINE"	EXT. FOREST - DAY
The action	Germania. The far reaches of the Roman Empire. Winter 180 A.D. <i>Incongruously enough, the first sound we hear is a beautiful tenor voice. Singing. A boy's voice.</i> CREDITS as we hear the haunting song float through dense forests. We finally come to a rough, muddy road slashing through the forest. On the road a GERMAN PEASANT FATHER is herding along three sickly looking cows. His two SONS are with him. His youngest son sits on one of the cows and sings a soft, plaintive song. They become aware of another sound behind them on the road -- the creak of wood, the slap of metal on leather. The Father immediately leads his cattle and his sons off the road. They stand-still, eyes down: the familiar posture of subjugated peoples throughout history. A wagon train rumbles past them. Three ornate wagons followed by a mounted cohort of fifty heavily-armed PRAETORIAN GUARDS. The young boy dares to glance up at the passing Romans. His eyes burn with hatred.
THE SCENE HEADING OR "SLUG LINE"	INT. WAGON - DAY
MINI-SLUG	ABOVE: THE STARRY NIGHT SKY BELOW: MUDDY FIELD AT 12 O'CLOCK: A WAGON TRAIN RUMBLES PAST AT 3 O'CLOCK: A SHADOW LOOMS
The action	Mist momentarily obscures a man's face. Frozen breath. The man is in his 20's, imperious and handsome. He is swathed in fur, only his face exposed. He is COMMODUS. He glances up.
Interactivity	<i>//THE AUDIENCE CAN MOVE AND EXPLORE THE ENVIRONMENT BY MEANS OF CONTROLLERS, EYE-TRACKING AND HOT SPOTS. THE AUDIENCE CAN COLLECT OBJECTS, I.E., FLYERS.//</i>
CHARACTER	COMMODUS (O.S)
Parenthetical	(intensely, Looking at the woman across from him)
Dialogue	Do you think he's really dying? The first thing I shall do is honor him with games worthy of his majesty.
The action	The woman across from him returns his gaze evenly. She is slightly older, beautiful and patrician. A formidable woman. She is LUCILLA.
CHARACTER	LUCILLA
Dialogue	He's been dying for ten years.
TRANSITION	FADE OUT.

Note. From *Building Your Script* [Photograph]

(<https://courses.vrtil.academy/lessons/building-your-script/>).

The SFX in *Immersiveplay* is unlike the conventional visual effects, other than image-wise effects, it also indicates the sound effect elements including sound, audio, music ambience and sound effects, in order to identify the sound effects in the script easily. Viewers' point-of-view (POV) in conventional film is manipulated by the frame, however in CVR, although the placement of the camera suggests the primary viewing angle for viewers, viewers' POV and their attention are freed from the first-suggested viewing angle. Therefore, Viewer POV is to indicate the key action that the audience should look at, and to suggest the ideal POV to unfold the story accordingly. Other than key actions, there are other parts in the spherical story space needed to be filled up and enriched. In conventional screenplay, a slug line is to indicate the basic information of the scene, such as the location, whether it is interior or exterior and the time. Such conventional slug line is not enough to depict the full spherical space, therefore, additional Mini-Slug is designated to identify the other elements that have no direct effects to the plot but are working as a supporting enrichment to the filmic space as a holistic world. Mini-Slug can be used to describe other characters, the surrounding environment and things in relation to the audience. Also, to locate the placement of things, Vargas utilised the hands of a traditional clock as an indicator. For example, an object placed at 3 o'clock is located directly on the right side of the viewer. Interactivity, as one of the most significant signatures of immersive media, plays a crucial part to how a viewer perceives the story. Although the script is written in a manner of how the screenwriter hopes the story unfolded, the interactivity can critically change the narrative flow of a script. Therefore, a specific formatting style is designated for this component to make it easily recognisable -

texts are italicised and highlighted in purple, and placed between two forward slashes.

Vargas mentioned that by learning Immersiveplay formatting, one that is not from the filmmaking background or does not have script writing experience can also write scripts for CVR, so long he or she masters storytelling fundamentals and has understanding for the immersive media.

Although the *Immersiveplay* template is formulated and made publicly available as a formalised and standardised CVR screenplay format, it takes time to or might not become a new convention. Other than *Immersiveplay*, CVR filmmakers generously share their own methods of screenwriting on the Internet and that have been circulated by the filmmaking community. There are many references that exist but CVR filmmakers might not find one completely suitable for all CVR projects. At the point of time, there is no one-size-fits-all CVR screenplay format, CVR screenwriters have to exert their creativity in customising a made-to-order format, either textual, diagrammatic or hybridised, to visualise the flow of each unique CVR story and the production needs.

In summary, in terms of producing a screenplay, it is suggested that CVR screenwriters may be required to equip more skills other than textual writing.

‘The potential to inhabit three-dimensional (virtual space) within the screenplay as opposed to representing it on the page in manuscript form has implications for extending further the screenwriter’s ability to contribute to a dynamic spatial environment’ (Ross and Munt, 2018, p. 23).

CVR screenwriter's job task of producing a hybrid or diagrammatic screenplay format is different from a conventional screenwriter, which is expected to lead to an occupational change in this role eventually.

4.1.3 CVR Cinematographer

A CVR cinematographer is in charge of the entire look of the film image. The expanded filmic space and the expanded profilmic event have reconstructed the occupational role of a cinematographer. In the aesthetic aspect, when the frame becomes 'frameless', the work of a CVR cinematographer is shifted from framing to mise-en-scène. Without subjectively compositing the frame and moving the frame to tell a story in visuals, blocking the live actions becomes an important means for a CVR cinematographer to input his or her visual idea. In the experience of Eve Cohen, the CVR cinematographer of *The Visitor VR* (2017), the work of a Director of Photography (DP) was not much about framing but how to work with the director together to guide the actions happening around the camera.

In the technical aspect, when a spherical image enables multiple narrations, theoretically it looks more complicated to take care of a wider frame. However, due to the technological limitation of 360 cameras and the work of stitching, the on-location camera work of a cinematographer is no longer as complex as a conventional cinematographer. Camera is the basis of a cinematographer's work, his or her work is dedicated to the camera. Framing as the primary job of a cinematographer is streamlined in CVR. When shooting the 360-degree in one shot, compositing the 'frame' could be simplified as placing the camera out and avoiding the flares. When a 360 camera is adopted, on one hand, options of camera movement are constrained; on the other hand, camera accessories and grip equipment are limited. Therefore, CVR cinematographers are no longer required to be in charge of constantly changing extensive camera setups between shots, it could be as simple as placing it on a tripod and cleaning the

surfaces of the built-in lenses. When the regular directional digital camera is being adopted, the camera setup could be as per regular tripod setups. Yet, the camera work is still very different from the established conventional camera work that involves a lot of camera movements and lens variations. Firstly, to produce a reality-like world in a full spherical image, only ultra-wide lenses are used. Secondly, image movement in CVR could cause acceleration (change of speed), rotation of the sphere and variations in the horizon line, which may expose the viewer to motion sickness. As a result, a stable (or even static) CVR image is preferred over camera movement. Therefore, CVR tends to have lesser camera movement, and choices of lens are limited. Hence, CVR cinematographers have less heavy camera work in both practical and creative aspects.

However, CVR cinematographers may have to pay more attention to lighting. Since the field of regard (FOR) is expanded to full spherical, the entire 360-degree space invisible with the camera needs to be 'film-able'. Regardless of what camera to use and the shooting method, when the shooting method of shooting all 360 degrees at once is adopted, CVR cinematographers can just point the camera and shoot with available lighting. In terms of leaving workload to post-production, point and shoot' is a more favoured and the easiest lighting approach, because there's no issue of having lighting equipment in shot. CVR cinematographers can also adopt a few common lighting practices inherited from conventional filmmaking to avoid having heavy footprint of lighting equipment in shot, such as hiding lights in the set structure (eg. using LED light strips) or using practical lights that can be filmed on screen. Yet, hiding the cables is still a challenge.

However, the image quality is not ideal when a 360 camera is used to shoot in low light locations, because up to this point of technological development of 360 cameras, the *dynamic range*²⁶ and the low light performance of a 360 camera is bad. In such cases, CVR cinematographers have to adopt different lighting techniques flexibly. *The Argos File* (2017) had very extensive lighting setups during the shoot. According to Director Josema Roig of *The Argos File*, they deployed a technique called *day for night*²⁷; they shot the night scenes in a mall during daytime. In conventional filmmaking, day for night technique is usually used in an enclosed space where the amount of sunlight can be controlled, such as a location with no window or with windows completely blocked. In *The Argos File* (2017), they made use of the sunlight coming through the mall windows to gain the basis of exposure for night scenes, which is a rare way to light a scene in conventional filmmaking. On top of that, they did massive lighting setups to light up the entire space for reaching a normal exposure for the camera. The lighting setup took up the production one full-day on the first day of shoot, yet, they still had to add more lights the next day, including LED lights and neon practical lights. Director Roig said, '*Even now I look at it, I'm like, "we needed more lights."*' Other than hiding the lights in the film structure, sometimes, they shined a light from the lighting setup into the camera, so that the spot was over exposed and the lighting setups at the back were well hidden. This method is allowed by the film genre sci-fi, in which a direct light shining to the camera does not look weird.

²⁶ In the context of cameras, dynamic range describes the ratio between the highest level and lowest level of luminance. It is measured in stops, in which one stop indicates a double amount of lights. Dynamic range suggests how much detail between pure white to pure black can be captured.

²⁷ Day for night is a film technique of simulating the night time scene when shooting during daytime by taking certain measures such as using filters or colour grading in post-production. It is often employed when it is too difficult or too expensive to actually shoot at night time, or when film stocks or camera sensors lack lighting sensitivity in a low light environment.

There are CVRs that on-screen lights are not appropriate and realistic in the story context, yet they need additional lighting setups to boost the exposure level and to create the cinematic look. There are two approaches to keep the lighting setups out of the screen. Firstly, to avoid shooting the lighting setups, CVR cinematographer can choose the quadrants-shooting method. But this method is not realistic when there is a single blocking across quadrants. Secondly, when additional lighting equipment is needed and is unavoidably in shot, CVR cinematographer can shoot a *clean plate* to help to erase the lighting setups in post-production. The work of erasing is not part of a CVR cinematographer's job, but he or she has to contribute by shooting a clean plate of the same background without the setup, which will be used to overlay the unwanted parts. To relieve the stress of post-production, CVR cinematographers can put lights at where there is a lesser amount of crossing, thus, lighting equipment can be relatively easier to erase, such as lighting from the ceiling. Same plating technique can be used to pull highlights by shooting the scene twice with two exposure settings. In conventional filmmaking, cinematographers are used to working with blocking to light, avoiding casting too obvious shadows. On the contrary, CVR cinematographers even have to prioritise the post-production when deciding the lighting setups.

CVR cinematographer either mostly rely on available lights or additional lights extensively, which is usually needed for CVR that has a stronger need of cinematic lighting. In the case of *Madame Pirate: Becoming A Legend* (2021), a 180-degree CVR in which lighting setups were easier to hide in the off-screen 180-degree. Yet, since they are shooting in a set in a black box

theatre, they had to heavily light up the entire space from scratch. Director HUANG Dan-Chi mentioned that their film set was very hot because of the massive amount of film lights, which produced a lot of heat when it was in use, *'maybe it's like 10 times (more) lighting than normal (film set)'*, HUANG felt that. Unlike the conventional lighting practice, where the amount of lighting setups is relatively in proportion with camera setups, CVR lighting approach is either minimal or extensive regardless of the camera setups regardless of the camera in use. When composing the camera frame is streamlined, but lighting became more critical, it is suggested that the occupational responsibility of a CVR cinematographer shifts from camera work towards film lighting.

In the perspective of division of labour in the camera and lighting department, there is a standardised hierarchical crew structure scaled by the budget. However, some CVR productions differ from the conventional productions, which vary based on the production budget and the needs of camera and lighting setups. The crew structure of CVR camera and lighting department is not only driven by the budget, but also by what camera is being used, the amount of equipment, the shooting method and lighting approach. For the CVR camera department, the crew could be as minimal as the cinematographer oneself when only a very small amount of equipment is used, such as one 360 camera and one tripod. More assistant cameras are recruited when more camera accessories are needed. The increment of camera crew size is in proportion to the amount of setups, in which this norm is reflected in conventional film productions. However, since the equipment in use and the operation are very different from the conventional way, CVR division of labour might not follow the conventional crew structure. For

example, heavy-duty dolly and track equipment are not applicable for doing a movement shot of a 360 camera, they are too bulky to be painted out in post-production, instead, a remote and motorised dolly system is more suitable for the expanded field of regard (FOR) (see figure 14). Dolly manufacturer *Motion Impossible* has even produced *M-360* specialised for rigging 360 cameras (see Figure 15). To operate the special dolly system, hiring a specialised technician instead of a regular key grip is recommended.

Figure 14

Motorised Dolly System



Note. From *Moving the VR Camera* [Photograph]

(<https://creator.oculus.com/skills-principles/moving-the-vr-camera/>).

Figure 15

M-360 From Motion Impossible



Note. From Motion Impossible [Photograph]

(<https://motion-impossible.com/products/m-series/m-360/>).

Also, some CVR cinematographers make their ways to move the camera, such as attaching the camera to the actor (see Figure 16) or to a wheelchair which can be pushed by an actor or a crew. In the case of *Defrost* (2019), Director Randal Kleiser played a nurse pushing the wheelchair rigged with a 360 camera (the viewer), he worked as a dollyman (see Figure 17). In

short, due to the difference in equipment being used, the crew structure of the CVR camera department does not necessarily follow the conventional way.

Figure 16

Actor Camilla Diana Wearing the 360 Camera Rig on Her Head



Note. Screenshot from Backstage / CHROMATICA

(<https://vimeo.com/314220846>)

Figure 17

Director Randal Kleiser with the 360 Camera-on-Wheelchair 'Dolly System'



Note. From Virtual Reality Filmmaking: Techniques & Best Practics for VR Filmamkers, by C.

Tricart, 2018, Routledge. [Photograph]

For CVR productions that heavily rely on available lighting, it is understood that there is no particular need for a large lighting team. Thus, the crew formation could be as minimal as only a gaffer or an electrician (lighting assistant). For CVR productions that require a certain extent of

lights, the structure of the lighting and grip department would follow the conventional one. While it is hard to compare all structured and unstructured crew formations one by one in detail, there is a phenomenon difference. According to Internet Movie Database (IMDb), the world's most popular and authoritative database for movies and TV, some key roles in the camera and electrical department are missing in CVR productions, such as dollyman, key grip and best boy. There are multiple factors possibly accountable for it - low demand of lighting or a result of a double role taken up. In the case of *Look At Me* (2019), explained by Director HO Wi-Ding, the role of a gaffer was taken up by the production designer, who visualised the film set with lighting plans and lit the set with practical lights. As a result, 'gaffer' this role was not listed on the end credit list in *Look At Me* (2019). Due to the changes in crew structure of the camera and lighting department, the working network of a CVR cinematographer could be very different from a conventional cinematographer.

Due to the bad low-light performance of 360 cameras, *pre-lighting*²⁸ (lighting work before the actual shoot) has become a very important process to resolve technical issues regarding camera exposure before the actual shoot. During on-location shooting, CVR lighting department has a different work culture than conventional lighting department. In conventional filmmaking, lighting setups will be modified to accommodate and enhance the lighting effect amongst different camera setups of different camera angles and shot sizes. It is common to see the

²⁸ Pre-light is lighting a film set before the official shoot. Sometimes pre-light is done a day before the actual shoot or just on the same day earlier before the start of the shoot with actors. In regular film productions, pre-light is led by the cinematographer and the gaffer, setups are done by grips and electricians. It is to minimise the time needed for lighting setups on the actual shoot, to enable DOP and gaffer more time to discuss and work on the lighting with less time stress, and to pre-visualize the lighting of the scene for other creative departments such as set and props.

lighting team busily working around the film set between shots once the cinematographer has made the decision. However, in CVR filmmaking, since wide shots dominate, the lighting setups do not change as frequently as conventional film. Especially when a 360 camera is being used, after the overall lighting tone of the location is set by the cinematographer and the gaffer, it is not common for CVR lighting teams to change the setups from shot to shot. The nature of CVR has formed the lighting team with a new working culture.

There have been new challenges that shape a different work style of the camera and lighting team, especially when a 360 camera is used. Cable management was one of the biggest challenges in the early development of CVR shooting. When camera technology became more advanced, built-in wireless transmission and streaming functions were available in most 360 cameras. For cameras without such function, whether it is a 360 camera or a regular digital film camera, usually a set of wireless transmitter and receiver is used to transfer video and audio (if any) signals from the camera to the monitor. However, in some circumstances in the early development of CVR shooting, such as the large file size of the signal or the interference around the shooting location, a cable is needed to do the transferring. Managing an outgoing cable from a 360 camera to a monitor at a distance is not really possible, because the 360 camera sees everything. Also, a lot of effort has to be put in the post-production to eliminate the cable. The advancement of technology has eased this difficulty for the camera team and the post-production team.

Not only were the crew structure and the working culture of the camera and lighting department reconstructed, there has been an on-going debate of the need for a cinematographer in CVR production. Due to the high accessibility and ease of usage of a 360 camera, there are CVR productions that the role of a cinematographer is missing, in replacement there is a VR supervisor/technician. Some argue that the role of a cinematographer in CVR can be doubled up by other creative roles such as CVR director, as long as he or she can operate the camera. On the contrary, some argue that the value of a CVR cinematographer is not only about the technical input, but also the input of interpreting a screenplay and creating cinematic visuals through photographic skills.

4.2 Expanded Profilmic Event and On-Location Film Practices in Cinematic Virtual Reality Production

The theoretical skills, the screen grammar and the aesthetic of cinematic virtual reality (CVR) are being studied by different scholars across the globe, however, how filmmakers collaboratively work 'behind' the camera is less explored. Even the word 'profilmic event' is seldom mentioned in the academic field. Yet, it is a very important part in production culture studies, especially when the 360 degrees around the camera is being captured at once, the CVR profilmic event transforms from zonal to spherical. The expanded profilmic event changes everything in CVR filmmaking practices, leading to a different routine practice and a different spatial management of production spaces.

On conventional film sets, routine shooting workflows are formed and followed by film crews to ensure efficiency and regularity. From equipment setup, communication language, spatial usage to the shooting tempo, there are conventions established not by top-down institutional regulation, but by everyday crew practice. Film crews share the same set of on-location routine practices across different productions, which has become the industrial norms. For example, after the shot design is decided by the director and the cinematographer, the cinematographer and camera operators will instruct the camera team for camera setups. Then, other departments including lighting, production design, sound, and production team will work according to the camera frame and any camera movement. The on-location film crews are familiar with the sequential workflow. They share the production spaces where they reposition

the equipment, production materials and themselves constantly between different shots and setups. For example, changing from a wide shot to a tighter shot may require additional lighting equipment; In reverse, when it changes from a close-up shot to a wider shot, it requires clearance of the lighting equipment. However, many of the conventional industrial practices cannot be brought over to CVR film practice due to the expanded profilmic event. When the 360-degree of the location is being captured at once, the profilmic event is expanded to the surroundings of the camera, the filming routine and the usage of production spaces have to re-accommodate to it. On conventional film sets, it is a conventional practice to move the equipment around off-frame and to make necessary changes according to different framings between shots. Yet, this is not a common practice in CVR when the entire 360-degree space is being captured at once.

The visual nature of CVR affects the on-location film practice. Since the field of regard (FOR) in CVR is larger, often set to 360 degrees wide, there is more information in one 'frame'. Viewers need more time to look around the 360° space and to digest one shot. When changing of shots takes more time, *long take*²⁹, a shot with a much longer duration, is more favoured in CVR. As a result, the conventional film *coverage*³⁰ is no longer applicable in CVR. There are no multiple angles, different sizes of shots filming the same scene. Instead, *master shots*³¹ encompassing the entire scene are more favoured. Therefore, in the sense of CVR on-location shooting, the

²⁹ A long take is a shot with a much longer duration than other regular shots. There is no standard cut-off duration to define a long take, it is a comparative concept to the conventional shots. It can last for several minutes. Digital cameras have considerably lengthened the maximum potential length of one take.

³⁰ Film coverage is the process of filming multiple angles of shots of a scene. Coverage can be described as consisting of two main types of shots: master shots and close-ups.

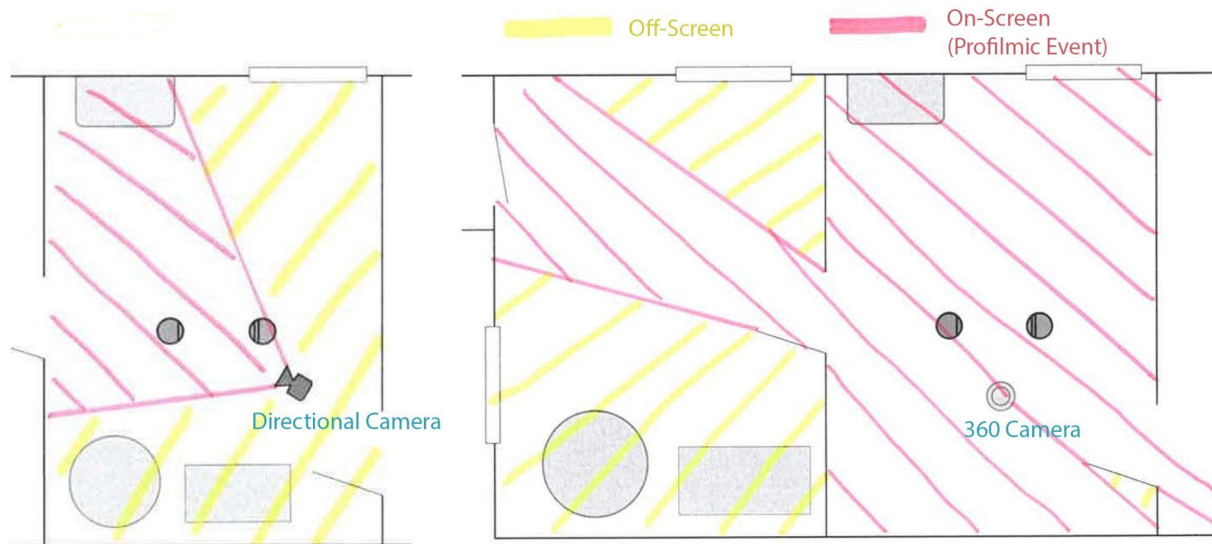
³¹ A master shot is a long take that encompasses the entire scene. It shows the entire cast of characters involved.

amount of shots is lesser compared to conventional filmmaking. Having lesser but longer shots in CVR suggest that setups changing in CVR are not as intensive as conventional filmmaking. CVR film sets have a different shooting speed and intensity which CVR film crews have to adapt to.

For CVR production shooting the entire 360-degree space at once, the profilmic event is expanded to the surrounding of the camera. There is no off-screen space around the camera, everything intervisible with the camera is being captured by the camera. Unlike conventional film sets, in which the space behind the camera is reserved for stand-by film crews and production materials (see Figure 18). On CVR film sets, things that are not supposed to be in-shot should be hidden away from the camera, including equipment, production materials and on-set crew members, which can be hidden somewhere else, such as behind the wall or the next-door room. The expanded profilmic event leads to a change in the spatial management of film sets, not only in the space around the camera, but also in other off-screen spaces as film crew and production materials are shifted to there (see Figure 18).

Figure 18

Conventional Profilmic Event and Expanded Profilmic Event When a 360 Camera is Adopted



Note. When a directional camera is used in conventional film production, there are off-screen spaces behind the camera where production materials can be held; While on a CVR film set that shoots the entire 360-degree space at once (eg. using a 360 camera), there's no off-screen space around the camera but only the on-screen space. In other words, a CVR film set has an expanded profilmic event, the production materials can only be placed in the next door where the camera can not capture.

Filmmaking relies on digital screens. On conventional film sets, a *video village*³² is set up for real-time monitoring of what the camera is capturing and for playback. Sometimes, a video village is hidden somewhere nearby and is invisible with the camera as long as it is out of the frame. It is to shorten the distance between the profilmic event and the video

³² A video village is an area for director's monitors set up by the camera department.

village in order to save time for creative majors and key personnels to walk back and forth between two spaces. The closeness and intervisibility of two spaces enable creative majors the freedom to monitor both profilmic space and the image (the screen) at their own convenience. They are able to give instructions on the spot while monitoring the images simultaneously. However, for CVR production shooting the entire 360-degree space at once, the video village must be well hidden beyond the profilmic event, somewhere not intervisible with the camera. Creative members and key personnels are forced to monitor the profilmic event through a monitor in the video village. Director Josema Roig tried to direct *The Argos File* (2017) in the profilmic event by dressing up as one of the crowd actors. He was actually in the scene and in front of the camera to direct the camera operator of the camera movement and to control the timing between key actions. In order to direct the crowd extras to act, Director Roig tried being the first one to react and that led the extras to follow. While being one of the characters in the scene is a way to monitor the profilmic event on CVR film sets, it is not an absolute resolution for CVR productions of expanded profilmic events. Creative members and key personnels still have to rely on the far-away video village to monitor the profilmic event.

There were limitations of the playback technology of 360 cameras, it is not as direct and convenient as regular digital playback. Watching a panoramic equirectangular image or a few spherical images of each lens displayed on a flat screen were the only real-time playback options last time. Those images were heavily distorted and were not visually similar to the final immersive experience on a headset at all; It required a lot of

imagination to watch. On the set of 'Building a Better McDonald's, Just for You', film crews used Google Odyssey to shoot the scene and attached a small Samsung Gear 360 to rover the live monitoring (see Figure 19).

Figure 19

Using Samsung Gear 360 for live monitoring



Note. Celine Tricart on the set of "Building a Better McDonald's, Just for You". From *Virtual Reality Filmmaking: Techniques & Best Practics for VR Filmamkers*, by C. Tricart, 2018, Routledge. [Photograph]

With the advancement of technological development, some 360° image real-time live monitoring systems are innovated such as *Farsight* from *Insta360*, a long-distance image transmission system. However, to watch the footage on a head-mounted display, it takes time to stitch images from different lenses of the 360 camera into a full spherical image, it then takes more time to render them into the headset. But the playback image quality of a low-resolution rough stitch is not as good as what it will be like after proper rendering in post-production. Some CVR filmmakers prefer loading the shot on a headset to watch at the end of the day, just like how filmmakers review dailies in conventional film production. Therefore, to monitor the image in real-time during the takes, they rely only on the flat screen display. Since stitching and rendering take time, the headset playback may only be available the next day of the shoot. Furthermore, watching the playback on a headset is personal, if creative crew members have to perform user-control of pausing or rewinding of the footage followed by discussion, they have to pass the headset around and wait. Unlike conventional film practice where creative crew members watch the playback together at the video village, CVR playback takes a lot of time to let everyone watch the same clip. On the shoot of *The Argos File* (2017), it took about 30-40 mins on each 'round' of playback on average because the creative members had to watch it on a headset one by one. Director Josema Roig mentioned that after the first take of the day, it took them an hour to go for the second take. Compared to conventional filmmaking playback which takes about a few minutes depending on the duration of the take and the follow-up discussion, CVR playback lengthens the time needed between each take. Some CVR directors would omit the playback of some takes because of the time that it takes.

Director HUANG Dan-chi mentioned that for their shoot of *Madame Pirate: Becoming A Legend* (2021), they only transferred certain takes that they thought were good enough into the headset for playback. And, there wasn't enough time for the actors to watch the playback. Director HUANG brings out an advantage of such inconvenient playback system, it is just like analogue filmmaking using film stock without a smooth playback system, everyone on set was more concentrated on the profilmic event but not the screens; When actors are refrained from watching playback, they paid less attention to and were less distracted by their on-screen appearance, such as their hair and make-up. CVR playback technological limitations alter the routine workflow, the shooting speed rate and the communication norms between film crews on film sets.

Due to CVR's nature of longer takes and the technological difficulties of a smooth playback on headset, CVR filming requires intensive rehearsals. Director Josema Roig and Director HUANG Dan-chi both mentioned that they did a huge amount of rehearsal before the actual shoot of their film. The purposes of the rehearsals are to increase the accuracy of the action and the timing of the blocking, and to make sure that there is no mistake in costume and props. This kind of repetitive rehearsal is similar to *dress rehearsal*³³ in the theatre. Director HUANG agrees that having theatre actors helped because they are used to abundant rehearsal, because they are more used to spending time on rehearsal.

³³ Dress rehearsal is the full-scale rehearsal of a live show before the first performance, where performers wear their full costumes and make-up and lights and scenery are used as they would be in the real show.

On CVR film sets, the spatial arrangement and the shooting styles are dissimilar to conventional filmmaking. CVR filmmakers have some new on-location film practices. When the new film practices are shared amongst the industry, they are slowly established into new industrial conventions and norms.

4.3 Cinematic Virtual Reality and Theatre

Cinema and Theatre

Theatre is a performing art found by ancient Greeks 2500 years ago and is still used today.

Theatre is an art form of storytelling in dramatic format - an enactment of scenes by performers who speak and act. It is the foundation of all dramas including cinema. Cinema, as an art form of performing arts as well as a mass entertainment, had developed into an independent and complete industry. Despite the fact that cinema has an established system of aesthetics and production different from theatre, the two art forms are often linked to each other. Since the 20th century, there are many renowned *Stage-to-film* works, film adaptations from theatre plays, such as *Dracula* (1931), *West Side Story* (1961), *The Sound of Music* (1965), *Lion King* (1994), *Mamma Mia!* (2008), *Macbeth* (2015) and *Moonlight* (2016). And with the help of screen technology, theatre creators have begun to add in filming elements, namely *multi-media theatre* nowadays. Up to this day, theatre and cinema are closely related to and mutually influential to each other. Yet, the two industries are two separate social-economic activities, having two distinct modes of production.

Despite the narrative similarities, there are fundamental differences between these two art forms. First of all, cinema and theatre do not share the same form of art. Theatre is *live*, the performance takes place in time as well as time; Meanwhile cinema is not live, the performance is pre-recorded. In theatre play, each performance is unique and different; On the contrary, in cinema, each pre-recorded performance (screening) is identical. Therefore, the relationships of the performers and the audience between theatre and cinema are dissimilar. Performers and

their audience share the same space where theatrical intimate connections are established when live performance takes place. The audience plays a critical role in theatre as a live performing art full of improvisations. All creative elements, such as actor performance, scenic design, lighting design and sound design etc. are directed to where the audience is seated. On the contrary, In cinema, everything is directed to the camera, which is the representation of the eye of the audience. Filmic connections are built through a screen at the mercy of the subjective camera and microphones. Through the work of cinematography and sound design, the point of view of film audiences is pre-selected by filmmakers. Filmmakers create realities which are being cut by the camera frame. Sometimes, the on-screen performance is augmented through cinematography and sound design. Not only are the camera and the microphones two factors leading to a different aesthetics and production, but film editing is also another feature that allows the big discrepancy. Film editing can reorder the chronicle order of the performance; It can even contract and expand the filmic time, filmic space and emotions. Film audiences perceive the filmic realities through different lenses of different focal lengths, various shot sizes and camera angles. They are not allowed to freely shift their attention around the entire reality of their wills as theatre audiences do when watching a theatre play. In theatre, since the stage performance is live, the performance is perceived at the moment when it is delivered. Different creative practices of theatre and cinema lead to two different relationships with the audience.

From the perspective of audience experience, audiences of cinema and theatre have different forms of viewing experience. Theatre audience has a fixed viewing angle, fixed from where they seat to the stage. Yet, they have the freedom to choose their individual point of interest from

that viewing angle at their own time. For example, they can look at the actor talking on stage left or another actor walking on stage right. Therefore, every single audience has a unique viewing journey and experience. On the contrary, the camera pre-selects the point of view (POV) of the audience. The camera frames which part of the performance the audience has to look at, whilst editing controls when they have to switch their POV. Thus, the viewing experiences of cinema audiences are consistent.

In the aspect of acting, filmmakers and screen actors are aware that the body of a screen actor is often partially captured according to different shot sizes. Cinema is compositional, actors' performance is composed not only by cameras but also by editing, which enables the dispersion and reoccurrence of performance. For example, two talking heads can be filmed separately in two different shots and then edited together as a conversation sequence. Because of that, this 'scattered' performance is allowed to reoccur in front of the camera as many times as needed to be perfect, which is opposite to the live theatre performance. Furthermore, theatre performance is head-to-toe full body performance with long dialogue. Since there is quite a distance between the theatre stage and where the audience seats, to convey the acting effectively, theatre acting requires obvious full body acting, such as exaggerated facial expression and dramatic posture. Theatre actors have to act apparent and intensive enough for the audience to observe at a distance. Theatre is much more demanding on vocal discipline: volume, projection and enunciation. On the contrary, conventional cinema does not demand that much from screen actors, because a tighter lens and closer microphones can help to magnify the details like facial expressions, small props and soft sounds, and to project them on

the big screen with a powerful sound system. Cameras and microphones are always pointing to the actors, picking up all their microexpression and whispering. As a result, speaking of the intensity of acting, screen acting is closer to real life.

Theatre performance is a nurturing performing art form. A full-length theatre play is about 2-3 hours non-stop on average. To ensure a smooth full run of the play before the opening night, it requires adequate time for rehearsal and cast bonding. On the contrary, even though a film production involves a lot of pre-production work, screen acting is on-location work. During on-location shooting, a scene is cut into shots. In other words, the actors' performance is 'scattered' into shots. They are allowed to repeat the particular performance for the particular shots. Screen actors do not have to memorise long dialogue and blocking like theatre actors do for a 2-3 hours show. As a result, there is a relatively very little amount of rehearsal time for screen actors on film sets, which is much less than that of theatre actors. It is suggested that theatre production and film production have two different directing and acting approaches, which leads to two different modes of production.

CVR Film Practices and Theatre Production Practices

In spite of the two different modes of production of film and theatre, the two production practices are being put together for comparison because of the emergence of an immersive medium - cinematic virtual reality (CVR), which provides its viewer with a closer viewing experience to theatre. Since a CVR is not a six-degree-of-freedom (6DOF) room-scale

experience, the viewers are not allowed to walk around the scene, therefore, the viewing angle of CVR viewers is fixed at where the camera is placed in relation to the scene. Yet, the filmic space of CVR is expanded to 180-degree to 360-degree. When a viewer watches CVR on a headset, the 'screen' size is beyond human eyes' field of view (FOV), he or she is given the freedom to turn his or her head and select a point of interest to look at, which is closer to the viewing experience of a theatre show.

Film scholars and CVR filmmakers have been relating the production practices of CVR to the theatre production for better understanding of the medium. Pope, Dawes, Schweiger and Sheikh (2017) compare the CVR profilmic event with the theatrical use of space in the perspective of spatial configurations in actor performance. CVR does not just manipulate space in a fixed frame, the spatial relationships between actors are manipulated, which resembles theatre and everyday life. Not only the spatial relationship in theatre performance is put on a parallel comparison with profilmic events, but even everyday life is being compared to.

CVR production has new conventions different from the conventional film practices, which are being juxtaposed and compared to theatre production. Despite the fact that the core difference between theatre and cinema hasn't changed - theatre is live and cinema is pre-recorded, CVR remains as a pre-recorded work of art, filmmakers found similarities between these two production practices, especially in directing and acting. Since wide shots are favoured in CVR, full body acting is required from CVR actors all the time. In terms of blocking, the work of blocking actors in CVR is heavier than that in conventional filmmaking, and it resembles how

theatre directors direct theatre actors. Since CVR tends to have longer takes, CVR actors have to do long dialogue and improvisation just as what theatre actors can do, in which it reflects that CVR filmmaking requires more rehearsal time, just like theatre shows. It is suggested that CVR directing is similar to theatre directing to a certain extent. Notwithstanding, CVR actors do not have to do exaggerated actions to project to the camera. Although CVR cinematography is less subjective compared to conventional cinematography, the camera and microphones can still magnify the microexpression of the actors. The dramatic intensity of acting in CVR does not resemble theatre acting. At the current point of time, there is no academic registration of CVR screen acting, there is also no industrial canon acting as a handbook to practitioners. By analysing the similarities and difference between CVR performance and theatre performance, it is suggested that CVR acting is situated in between conventional screen acting and theatre stage acting.

In conventional filmmaking, the 'dress rehearsal' is conducted on film sets. Since digital recording doesn't give as much financial burden to the production as film filmmaking did last time, shooting the on-location rehearsals for preview is a common practice. However, CVR filmmakers prefer a dedicated time for rehearsal before the actual shoot, or even scheduling in rehearsals in pre-production.

In the perspective of lighting, scholar Oriyomi Adewale Adenuga found a few theatrical lighting approaches might be suitable to direct attention in VR - fading lights, follow spotlights and pulsing lights. In theatre, variation in light intensity is used to guide the focus point of the

audience. Fading lights can help to shift the audience's focus from one area of the stage to the next. It also provides the actors with the opportunity to enter and exit the stage without drawing attention. Same as fading light, follow spotlight and pulsing light are also some lighting movements that can direct attention to follow the story sequence. Nevertheless, these lighting approaches suggested were only tested in VR content created by software but not live-action CVR. Lighting design in CVR is harder as it has to be in the context of the narrative environment.

There are many similarities in directing, acting and viewing experience between CVR and theatre, it is suggested that CVR production resembles the long-established theatrical production to a certain extent. More in-depth and specialised academic studies are needed to determine the degree of similarities between two art forms and the modes of production. To study the film practice of CVR, theatre will be a crucial subject to analyse and to theorise the industrial practices.

5. Discussion

Technological development has been changing art creation. The adoption of VR technology in filmmaking has led to a lot of fundamental changes in film aesthetics and the shooting practices, starting from the size of filmic space. Unlike how computer technology has completely altered the way media is created, immersive technology adoption in filmmaking does not replace conventional cinema. Nevertheless, over the years, the medium has evolved to an individual art form that has its place in film festivals in different names, including Virtual Reality Films, VR Experience and Immersive. Academic scholars have also started to study this new medium - Cinematic Virtual Reality (CVR), a term more used in the academic field specifically referring to non-interactive live-action 360 narratives designed to be watched on a headset.

Since the existing conventional filmmaking practices are designated for moving images in a rectangular frame, CVR filmmakers do not find them applicable to their productions, they have to apply new techniques to adapt to the 360° spherical filmic space. For example, CVR screenwriters have to design their own screenplay format for each different CVR project. At the current point of development, there is no industrial standard shooting practice. But there are some common practices shared in the industry, in which some CVR practitioners are trying to formulate them into the conventions and norms. Some have shared their filming experiences online; Some even have written a book about it.

In filmmaking as a long-established art form and entertainment industry, modes of production are established to facilitate efficiency, regularity, stability, conformity and budgetary control of film productions. Film studies authority scholar David Bordwell defines the mode of production as a dynamic relationship between three elements - the labour force, the means of production and the financing of the productions. By studying the dynamic relationship in the CVR community, a new mode of production of filmmaking is observed.

‘Means of production’ includes all physical capital related to the film production including the filming technology. In CVR production, there are a few shooting systems, in which shooting the 360-degree space at once with a 360 camera is the most common system in the industry. Camera equipment in CVR production is very different from conventional film production. When the entire 360-degree space is captured at once, the profilmic event is expanded to the 360-degree surroundings of the camera. The expanded profilmic event has fundamentally changed the on-location routine practices and the spatial arrangement of a film set. For example, film crews can no longer stand behind the camera to stand by for the next take when the camera is rolling. The means of production of CVR filmmaking is no longer the same as the conventional mode of production.

In the dynamic relationship of filmmaking, when the means of production changes, the labour force changes. Due to the expanded volumetric filmic space and the corresponding expanded profilmic event on CVR film sets, CVR filmmakers have to equip themselves with new skills to produce CVR from pre-production to post-production. For creative majors such as director,

screenwriter and cinematographer, their job tasks are no longer the same as conventional roles. They have to adopt new techniques to serve the storytelling for a 360-degree filmic space. For on-location film crew, they have to adapt to new routine practices, new spatial arrangement of production spaces and a different shooting culture. Working on a CVR production is an occupational change for filmmakers who come from the conventional background, they face fundamental changes in the crewing structure and shooting conventions.

Although the financing of CVR production is left out in this research, the two factors, means of production and labour force have exemplified a clear change in the dynamic relationship, which has led to a new mode of production of filmmaking - CVR mode of production. Due to the maturity of the filming technology and the variety of shooting practices, there is no industrial standardised mode of production for CVR production theorised at the current point of time, the CVR mode of production that proposed by this research is based on limited observations of the industry in comparison to conventional filmmaking.

While the mode of production of CVR is still evolving and being theorised, practitioners and scholars have been comparing it to another long-established performing art production - theatre. There are many similarities that can be put together for comparison in the two productions, especially in the perspective of directing and acting. Conducting textual analysis to compare the aesthetics and production practices of CVR and theatre is not comprehensive enough, more ethnographic research conducted by practitioners from both backgrounds are

needed in order to identify the relationship between both art forms, and to find out the application of production practices to each other.

Some scholars refer CVR to omnidirectional movies, as an extension of conventional film. It suggests how CVR finds its position in the new media history. However, unlike what computerisation has done to the analogue old media, the adoption of VR technology to filmmaking does not replace the conventional film to a great extent; CVR does not replace conventional film; A VR headset does not replace the cinema. Instead, combining VR technology with cinematic elements enabled the birth of a new format - cinematic virtual reality (CVR), which co-exists with all the available moving image formats. At the same time, the new film practices in CVR production also will not replace the convention film practice. In reverse, a new art form requires new film practices. The new film practice concluded in this research should be shared and be improved by industrial practitioners on an on-going basis in order to establish a systematic mode of production to facilitate economic productivity.

At the current point of time, CVR are categorised in different ways in film festivals. Some are named under live-action VR; Some are just labelled as immersive experiences. Without a mature categorisation of CVR, academic study of CVR film practice might not be in sync with the industry as the research scope is only set by individual scholars. In addition, due to the rapid development of technologies, academic studies and definitions are not sufficient to conclude the up-to-date industrial practice. In this research, the data collection focuses on CVR production that took place in 2016-2018. There is still a knowledge gap between the most

recent industrial development and the thesis. However, academic research is important to frame up the industrial practice into reflexive materials in a systematic way, at least in the academic world. This research attempts to identify how the new CVR mode of production is formed at the current point of time, which shows its potential of slowly developing into an independent industry that has its own economic activities, labour system and production line.

Lacking in-depth interviews with CVR cinematographer is one of the limitations of this research. There is no CVR cinematographer interviewed in this research because there was no one available amongst those who were responsive upon invitation. Although the observation in CVR cinematography practices is done by textual analysis of online materials, those online second-hand data may not reflect the most updated industrial development. Another limitation of this research is the inadequate data collection. Many of the interviewees are first-timers in CVR production, although they are experienced filmmakers in conventional film production, their CVR filmmaking experience may not reflect the most mature and established practices in the industry. To study the film practices of CVR, having more experienced CVR filmmakers as interviewees and having more in-depth and comprehensive case studies of up-to-date CVR production are needed. Lastly, the entire post-production process of CVR is not included in this research scope, to study CVR film practice and to theorise the mode of production of CVR, in-depth and comprehensive research on post-production of CVR productions are needed.

Appendix

Interview Transcripts

1. Director HUANG Dan-Chi 黃丹琪 and Director Morgan Ommer

CVR project: Madame Pirate: Becoming A Legend 女海盜：成名之路

180-degree, non-interactive, fiction, mixed with live-action and animation

Duration: 17 minutes

Release Year: 2021

Madame Pirate: Becoming A Legend is a 180-degree CVR co-directed by Taiwanese Director HUANG Dan-Chi and French Director Morgan Ommer. It is a combination of half live-action and half animation CVR that recreates the legendary story of CHING I-Sao, the notorious 19th century female pirate in Asia. Madame Pirate: Becoming A Legend was selected for the Kaohsiung Film Festival 2021. Both directors are from conventional filmmaking backgrounds.

(circle - Interviewer; Dan-Chi - Director HUANG Dan-Chi; Morgan - Director Morgan Ommer)

circle:

Oh and one thing...In my research, I am comparing the two alike but different art forms which are "conventional film" and "Cinematic Virtual Reality". Some will categorise them as the 2D and the 3D respectively. But I think "conventional film" and "Cinematic VR" are less confusing. I am using the word "Cinematic Virtual Reality" instead of "VR film", but since "VR film" is more common and widely used, we can still use "VR film" for our convenience of communication. 在

我的research裡內是用"Cinematic Virtual Reality", 但是virtual reality film 我覺得是比較多人說, 所以我們溝通用VR film吧。Do you usually called it "VR film"? Or you use another term?

Dan-Chi:

We use "VR film"

Morgan:

We use "VR film" and "VR experience"

Dan-Chi:

"VR experience" yeah

circle:

So which term you prefer me to use?

Morgan:

To me it's the same, we can use either

circle:

Okay then maybe we use "VR film"

Dan-Chi:

Yup

circle:

Let's begin with both of your backgrounds. How long have you been making VR film?

Dan-Chi:

It's my first time

Morgan:

Me too

circle:

So before that, you both were working on conventional film?

Dan-chi:

Morgan, your internet is a little bit late, right?

Morgan:

I think it was yours

Dan-chi:

Oh mine? Okay

circle:

Maybe it's mine, haha! Sorry for that

Dan-chi:

你剛問我們的背景嗎對不對

circle:

對

Dan-chi:

I think Morgan can start first, then I talk about myself

circle:

Okay sure

Morgan:

I started as a photographer. And I have started making films, short films about...I don't know...maybe 3 or 4 years ago. Madame Pirate is the first properly produced VR film that I made. I had before experimented a little bit, shot something with VR cameras, but small. So, Madame Pirate is the first proper VR film that I've made with Dan-Chi.

Dan-chi:

My background is...I started filmmaking in university, when in college, and so, it's about director. And I made fiction short film and documentary or TV commercials as a director. But for VR, this is the first time, it's my first project.

circle:

What makes you to choose between two forms? Like what made you start this VR film?

Dan-chi:

Morgan you go first or...?

Morgan:

Dan-chi? ...I go first, okay

Dan-chi:

Ya ya ya anytime you go first

Morgan:

I have been working on this project for about 6 or 7 years. I have pitched it as different things, as a documentary first, as a fiction, I even pitched it as a instagram story. And then, couple of years ago I met Estella from sand DPD films, and we started to discussing using VR as a medium. She invited me to the Kaohsiung Film Festival, 3 years ago now. So I went and looked a whole

bunch of VR. I found it is really a different way of telling the story. The viewer is inside the set, it's on-set. Technically there is a lot of problems of that, but it's a really interesting and different way of ... the whole immersion thing, makes it very challenging, and I thought I was interested. That's basically how I chose.

Dan-chi:

I answer in Chinese. 因為台灣這幾年的VR作品蠻多的, 然後在國際上面回應也蠻好的。然後我自己看過一些VR作品, 我覺得它可以連動人的身體的感受跟身體的經驗是非常有趣的一個溝通的方式。它跟我們在戲院裡面看電影是不一樣, 透過一個敘事是不一樣。VR可以觸發更多身體的感受。所以那時候對VR.....我本來就想做VR的作品, 然後當我在想說可以做甚麼的時候, 剛好Morgan跟Estella他們就有提到就是Madame Pirate這個project, 問我有沒有興趣就是一起。因為Cheng I Sao其實是一個亞洲的海盜嘛, 亞洲的女性, 所以我比較是用這個角度跟Morgan一起合作, 一個女性導演, 一個女性視角, 怎樣看這個project。

circle:

Understand. So I just generally talk in English lah. I understand that VR content, the experience is very unique. But I would like to shift our conversation to the production perspective since it is for my research. So, maybe we can talk about it later, for the content.

So, in terms of production. I assume that both of you can feel very very different from the conventional filmmaking. So, speaking of the format, speaking of the crew structure, like the division of labour, what is the difference between two forms?

Morgan:

So, what do you mean?

Dan-chi:

好像會延遲

Morgan:

What do you mean by division of labour?

circle:

As in like crew structure, as in the roles, the positions in different departments like directing department, camera department, sound department, producing department, any difference between conventional filmmaking, crew structure and crew structure of VR filmmaking?

Morgan:

Not really. We had...to make this film we had...we shot three days in the studio of live action.

The structure of production is exactly the same in the conventional film. We have sound department, DOP and set decoration and costume...so it's exactly the same. But changes is technical things...because in VR, we shot 180 degrees, the 180 degrees camera. The changes is...for each of these departments, on set, the technicalities of where you put the camera, where you put the lights, where you put the microphones, because in VR you kinda see

everything, right? Even more so in 360 where, it's nowhere for the crew to be. But in terms of labour division and production challenges, to me it is very similar to traditional film.

Dan-chi:

I think for me the answer is similar. About the spatial priority is the blocking of the actor.

Because in our project, we don't move our camera, but some VR project they move the camera, but we didn't do that. So, we need to use the blocking to let actor can come closer to the camera for audience can recognise the character. So, actor performing I think it's another part a little bit different with the experience we have before. But, art department.....ya I think actor is another part, ya

circle:

So, both of you think that it's not much difference in terms of the division of labour. From you credits...I got the file from the producer Jamie, from the file, she showed me...i realised in the credits, there is no gaffer or the electricians, the lighting team. But there are the electricians and the gaffer right in your production?

Dan-chi:

It's a little bit more difficult than experience we had before, because VR camera need more lighting, maybe it's like 10 times lighting than normal we used the camera. So, if you are on set, you can see there's many many lights on the sky of the studio, actor felt hot because of the clothes, the dressing.

Morgan:

I would say the directing live action in VR is closer to theatre. Because you have the whole set so we play a little bit with the blocking. But the performance, the way we directed the actors is closer towards theatre directors. Also, light in theatre, cause the technology of the camera is not as developed as normal film camera, they both developed but not as developed, right, we need a lot more light which is what Dan she was saying. Yes, the actors get hot, the whole set gets hot, and the lights cannot be hidden much, in our case, it all came from the top, mostly.

circle:

So both of you agree that there's not much differences in the crew structure. 所以就是結構上面, 分工上面沒有很大的分別。In terms of the on-location shooting, is (are there) any difference between the conventional filmmaking and VR filmmaking? As in like, you have to hide the crew 你需要把人藏起來, 就是那些blocking分別, 可以再詳細講解一下嗎? Can explain a bit more further of the on-location shooting, the flow of shoot, the blocking, the process, the time that you need, the spatial usage, any big difference? Or any difference that normally we don't notice?

Dan-chi:

I can show you some details in Chinese. 因為我們這次用的VR的Camera是180度的3D, 但是其實也有一些project會用360度, 但是不管是180還是360度, 跟我們一般的劇情的拍攝比起來, 它鏡頭拍到的範圍都是多了非常多了, 所以當然第一個就是工作人員要躲的地方一定是

攝石後面，然後可以工作的場域其實變小一點。以後傳統拍攝，如果是拍比較特寫等等的，打燈啊可以靠近一點嘛，但是VR沒有辦法。再來是，對於拍攝的時候，美術的道具或者是衣X的這些東西，因為我們拍VR沒有廣角鏡頭接特寫，就是一卡一卡分開拍嘛，看起來像劇場一次拍下去，所以在服裝的設定上面，美術跟道具其實都必須是在一個鏡頭內可以不會有破綻。比如說我們要拍女海盜她到最後要打盜，然後掉到船的下面去，如果用傳統拍攝我們可以拆很多的鏡頭，讓她看起來每一個卡都很真嘛。然後可以用剪接的方式去做修整。可是因為VR拍攝沒有辦法，所以我們其實需要透過大量的排練，讓這些道具這些美術所有的演員在過程中就一個take的裡面都是沒有問題的。這個是用VR攝影機的拍攝上一個……但它跟那個裡面有關係啦，所以就連在一起。再來是，VR攝影機的拍攝它需要有一些蠻多的測試，因為VR攝影機會有說多少距離內的成像是最好的，可能比如說一點五公尺或者兩公尺就是最好，最清楚的距離，可能遺憾那邊的3D效果也最好的。那又怎樣讓演員的走位可以走進這個所謂的好球帶，也是需要測試的。如果說工作人員，只需要躲在後面，就是攝影師不同的角度，這個對一般工作人員說沒有太大的差別，因為其實是躲好啦，也沒有說甚麼真的是會有大問題的。Morgan I shared about the first part is because the VR shooting we don't have like closeup and the wide shot for editing, you need like, somehow like, everything need to be prepared, well done in one take, so we do the rehearsal, also the art department or the costume need to work together in one take can be good. How about your feeling?

Morgan:

So, this is what is similar to theatre. The other big issue when you shoot in VR is, because the feedback came on the control screen, you actually see it in a 180 degrees, so you have a distorted circular image, you can't see much. So, for each take, we would make sure we have a

good take that we kinda like, and then transfer that into a VR headset to actually see the take.

Of course, you can't do it for every take and scene, it takes too long. What you have on the control screen is a completely distorted image, it's kind of difficult to see what is happening. You have to pay close attention. We spent three days in the shooting scene, waiting i don't know about 10 mins for the file to transfer into a VR headset to watch it, right? That's still challenging. What Dan she is saying is part of the reasons why I think directing VR live action is closer to theatre.

Dan-chi:

I just think of remember another point for the shooting, what's different is playback. Because when we do the VR shoot, in the monitor, it's like a fish eyes vision, so actually you cannot watch it very clear(ly), it's not like a traditional shooting because traditional shooting we have the monitor and you can see everything clear(ly) to check the playback. But VR shooting...When the shooting, actually we cannot make sure does it good or not, because we looking on set and guessing like oh probably it works. We need to like...for example, we have like take one to take four, and then we put the source into VR headset, and check in the VR again to make sure it's good.

circle:

Interesting. So, there's no real-time playback.

Dan-chi:

You can playback in real-time but the video is like a fisheyes, so everything compressed together, it's a circle.

(...circle went to keep clothes...)

circle:

So, continue the discussion on the playbacks. In conventional filmmaking, we actually quite rely on the playback right Since the filmmaking turns digital, director needs to watch the playback, cinematographer needs to watch the playback, actors need to watch the playback. So if you don't have the 360 or the 180 playback, you have just a fisheye real-time playback, did it make it more difficult on the rehearsal or the filmmaking process?

Morgan:

A little bit, it's a little challenging. Normally you look at the screen, you know the scene is good or not...This one, you have to guess. I mean some you kinda know, right? When something's wrong you know and you can do it again, but to really check, we need to...this is what we did, we shoot maybe 2 or 3 takes, then we put it in the headset and check, so it takes a little longer.

Dan-chi:

And actually the actor doesn't watch the playback on set, because it takes a lot of time, so they don't have chance to watch it. So, somehow, also like we used the film to make a filmmaking. I

think everyone more concentrated than we use a digital camera. And the actor won't care about oh my face is good or not, or my hair is good or not, only focus on acting.

circle:

So, for this shoot, did you prepare the shot list or any storyboard for communication? Like pre-production. 有沒有一些分鏡列表或者一些storybaord之類？在拍戲之前 before you start shooting?

Morgan:

Yes, we did a lot of preparation because also the film we made is a mix between live action, and we mixed it together with paintings. It's a tool inside, I think Google mixed it, it's called Tiltbrush. So, the scenes are mixed. And when we were shooting, we didn't quite know how to integrate, how to mix the live action and the paintings, but we prepared a detailed storyboard, a detailed story, detailed everything actually, which we shared with the actors beforehand. The scenes are choreographed.

circle:

Can you explain further details on what's the difference between the storyboard that you have for this VR film than the storyboard that you had for your previous conventional films? 就是可以詳細講一下你有的那些storyboard一些分鏡, 它跟以前的一些傳統電影有沒有甚麼大的具別嗎?

Morgan:

So, in the previous films that I had made, the storyboard is indication for me. I can be on set, and then I don't know, I have an idea or I see something, and I can just shoot the scene, different, it's not on the storyboard. Because I can it will work with the story that I'm going to tell. In VR, it is less flexible. I mean, certain scenes that we did improvise, but it is more rigid. Because this, a lot of elements involved. When you start changing on set, your story might just disappear.

Dan-chi:

I think the storyboard in VR because we didn't use a lot of different lens and the camera like closeup or what, the storyboard somehow is more like a blocking drawing. The size actually is the same, we draw a key action, like maybe the actor is far away, and then we draw another card is actor in front of camera. 我們畫了一些重點的動作這樣子, 但是其實鏡頭的size就並沒有變化太多, 所以你看起來不會像一般的storyboard一樣, 好像直接看起來就是一個完整的結構的故事了。Another special point in our project, because we put live action and the Tiltbrush together, so, our storyboard in the very beginning we had two sides, one part is live action, and the other side is animation storyboard. We put it together, and try to guess if we combine together in 360 space, what will it look like.

circle:

I had seen some VR storyboard, they actually draw a circle, draw the 360 degree. So for your project, you actually have a half circle is it? Because it's 180-degree.

Morgan:

Sorry didn't get that. Is our storyboard in 180 degrees or 360 degrees, is that you asked?

circle:

So, the storyboard is not just a textual storyboard, right? You have to draw, it's like graphical?

Morgan:

Yup

circle:

So, talking another thing in the pre-production, like location scouting, recce, mostly the live action we shot in studio, right? So, is there any difference between the location scouting the recce for this film and for other conventional films? 就是你的找場景的時候會有甚麼具別呢？就是比以前，跟傳統電影找場地的時候，有沒有甚麼要注意？

Morgan:

So we shot in a studio, which means we cannot with the art departments on what kind of set we could build in the studio, that is I think identical to more conventional movie making. So the things we discussed is should we do green screen, should we do this or that. But actually the art department, we discussed with them before, and they built the deck of the junk inside the studio, and they also build parts of the captain's cabin. So ,these were two sets which had been

discussed and drawn before we even entered the studio. That, I think, is identical to classic moving image.

Dan-chi:

Agree

circle:

In terms of directing actors 在導演方面 did you use ...are those actors did have VR acting experience before you film?

Morgan:

I think some had tiny bit, most of them had no VR experiences.

Dan-chi:

No.

Morgan:

Even they had a little bit, some of them had seen VR, but whole bunch of actors that we worked with actually had theatre experience. Some of them even teach acting, so they are quite familiar with acting on stage which helped a lot.

circle:

Can you explain further more how the acting in stage helped the blocking or the acting in VR film? Do you have any example how did they helped on VR film?

Dan-chi:

你可以用中文問一次嗎？我確認一下我有沒有理解錯意思。

circle:

好，就是有些演員是有舞台的經驗嘛，然後Director Morgan 說反而他們從舞台那邊的經驗可以幫助到你們的拍攝。我就想問一下有沒有一些例子就是他們是怎樣的情況底下他們可以運用他們的舞台經驗去幫助VR拍攝？

Dan-chi:

For me I can think of two points, the first one is theatre actors are really 他們很習慣那個彩排, they do the rehearsal right, theatre do a lot of rehearsal, so when VR we need to do a lot of rehearsal, they are willing to do that, they won't judge your time, they won't say "No, I'm just coming one time and I will say bye bye." The second point is, I think, in VR shooting, especially in our project, you can see the actors' characters whole body, from head to feet, to the ground, right. So, the theatre actors are good at use their whole body to do the acting. Because in the project, actually the face expression is not clear, but you need the body to do the acting.

Morgan:

There's no closeup, alright? So, you express the character through the movement and the expression of your whole body, everything.

circle:

So, can I say that the acting in VR film is actually quite different from screen acting? VR裡面的演戲跟普通屏幕的演戲是很不同的嗎？

Dan-chi:

I think for actors, acting is the same. If you talk about what kind of acting, how to act, how to do the emotion, for them, i think, it's the same. But for director, we will consider how to let audience can clear(ly) understand what's the acting. So, for example, when we do the blocking, we need to take care of every key action to be seen very clear(ly), and 如果不行的話我們會請他做一些表現上面的修改, 為了讓動作看得更清楚, 可是如果我回到講演員怎樣詮釋一個角色應該是一樣的。

circle:

Anything from Director Morgan?

Morgan:

No, I agree with Dan-chi even but she said in Chinese, I agree.

circle:

Can we talk a bit more about the sound recording? Are all the actors had a lav mic? So, the sound recording actually came from the lav, but not from the boom? Or is there any boom?

Morgan:

No boom. But there's also very little dialogue. We have recorded the sounds on stage and then we used basically the sound on stage to make the soundscape, the story is told through a voice over. And the reasons for the voice over is it allows to...Because in VR subtitles don't work, right? So, we have two versions, one in Mandarin and one in English, and we used the same actor to record an English version and the Mandarin version of the voice over to tell the story. We did have microphones hidden in the whole bunch of places when we were shooting the scenes, but all of that is basically background sounds.

Dan-chi:

And for the recording part, I remember we used a microphone but it's not boom, it's more like a 360 surrounding microphone. And they put some mini microphone hiding of course characters and also hiding in the setting to do the recording.

circle:

I think we covered a lot of interesting points, so I want to have a concluding question like to your role as a director, any significant difference or any worth-talking point of VR director, any difference to conventional film director? 作為導演這個角色裡里, 有沒有很大的一些很重要的改變或者是分別, 比傳統電影的導演? 就是你們 what you have to worry about? What

directions that you have to give is based on the point of the 360, 180 camera? 在一個180度的鏡頭, 你們給出的指引是有沒有特別是為了這個180度的攝影機去而有甚麼改變?

Morgan:

So, I go first, is that okay Dan-chi?

Dan-chi:

Yes.

Morgan:

So, for me, VR filmmaking, the live action recording is easy, it's similar, you know across theatre and normal filming, traditional filming. The really difficult experimental part is putting footage together in the game engine. All of this is new technology, it feels like making a conventional film to beginning of 20th century, in 1900. A lot of things you can do, a lot of things you cannot do. So, at the same time, making a VR film now feels like you are contributing to the invention of the language, but using game engine and mixing live action and paintings or animation making a VR film is feels like experimental film.

Dan-chi:

I agree with that. I think the challenge came from post production. I think it's also because it's our first VR project, so we don't have the experience to tell you like what does the footage will become in the end. In traditional shooting, when we do a closeup bla bla bla, in our head, we

are thinking like “oh we can do the editing like that, like what”. But in VR, there’s no this kind of data can use.

Morgan:

It’s a new language.

Dan-chi:

Yes

Morgan:

And both of us were experimenting for the first time.

circle:

Understand. So do you think, I actually personally don’t agree that VR film will replace the traditional film, the cinema, but some will say “Oh it’s the new trend...”

Morgan:

Sorry I interrupted you, you go ahead.

circle:

Do you think it’s another new art form? How do you think of this film production in the future?

Morgan:

So I hope VR doesn't replace traditional film. I love traditional films. I think it's...I think I hope that the equipment to watch VR will become lighter and easier. It can become its own....like film didn't replace theatre, musical theatre did not replace opera, right? I'm hoping that it is new and exciting and still experimental, and hopefully develop into something that can be in parallel with cinema or theater or...that's what I am hoping.

Dan-chi:

I think it's not easy to replace because it's two kinds of media, there's a lot of big difference. For example, VR watching is, I think, for me is very personal, you watch the project in a headset by yourself. But if you go to the cinema or theatre, you can share with your parents, your friends, you talk when you watch TV, right? But not easy to say we watch VR together and we chatting.

circle:

So, I think we have covered a lot of interesting areas about film production on VR films. So, really thanks a lot for today's time... sorry I need to close the window, it's too noisy....sorry to disturb, yup. So thank you so so much for sharing your filmmaking process and I hope that we can have more time to talk about your film. But I think for today's interview, we can put an end to it for now. Is there anything that you hope to particularly want to say? Or talk about your film? Just anything.

Morgan:

Did you manage to watch it? Did they send you something?

circle:

Yes, they sent me a....but it's a 2D version of the 180-degree version, so, I can only watch what the person pan to me, so it's not my own choice to pan my head to look around, but instead i'm looking somebody's vision. As in like there's a frame in the video. Yup so it's quite limited. But i managed to watch.

Morgan:

So, you watched it in VR? You watched it with your Oculus Go? No?

circle:

Yes, I've watched it both on flat screen and on my headset, but they are pretty much the same because they don't have the VR version, they just have the 2D version for me.

Dan-chi:

Morgan, Estella has shared a MPEG 4.....

Morgan:

You will see it soon.

Dan-chi:

Haha. I think there's one thing I can share, after we've finished the project, feel like "animation part, some part is not good enough, some part in live action is not good enough, and you put it in the whole project, you can see, as a director, of course, you can see many points can be improved. But, and you will worry about "does the project well done?" "Is it complete or not?" Somehow (this month) I changed my mind, I feel like, doing VR, the experience spirit is more than the project look really good. Sorry I use in Chinese 我覺得在做VR的過程中有太多實驗的東西, 所以像以前如果我們是做2D的影片, 就是其實你很容易把, 很可以把影片掌握在你覺得是一個很不錯的狀態, 然後它是可以跟觀眾完整度是高的, 可是VR其實會在做的過程中會有東西是你知道其實是做不到, 或者是說啊這次不成功, 這次的實驗是不成功的, 對, 那我之前會這樣子想, 可是這一兩個月就, 久一點再來看這個作品, 你會覺得其實我們最大的精神就是在我們想要去實驗live action跟動畫結合在一起這個東西, 所以這中間是必一定有它的小問題, 可是, 其實都沒有關係, 重要的是我們實驗了這個東西, 覺得就是這是我們自己覺得的, 因為一開始我們會想要做這是因為其實很少人把live action跟動畫放在一起做, 因為其實它很吃力不討好啦。但是我們那時候還是想試試看。大概是這樣。

circle:

I think that's the point of art, right? It's not a business, it's not a pure business or entertainment. As in like you experience the process of being creative, to enjoy the moment with the creative member, collaborations. Ya, so, for the interview, we can put an end up to this point. Thank you very very much for your time. Definitely love to talk more about it, when we have time.

Morgan:

You are most welcome. Sure I'm happy to talk with you

Dan-chi:

Thank you so much

2. Director & Screenwriter Milad Tangshir

CVR project: *VR Free*

360-degree, documentary

Duration: 10 minutes

Release Year: 2019

Milad Tangshir is a documentary director from Iran. *VR Free* (2019) is his first CVR documentary. *VR Free* (2019) portrays some fractions of life in Turin Prison and captures the reactions of a few inmates when they experience some immersive videos of life outside of the prison, which are some collective or intimate situations that are no longer within their reach. *VR Free* (2019) was the winner of 360° Cinema in 2020 Aesthetica Short Film Festival and the winner of Competencia VR in 2019 BOGOSHORTS Bogota Short Film Festival, and was nominated in many other VR film festivals. *VR Free* (2019) was filmed by a 360 camera in the actual Turin Prison.

(circle - Interviewer; Malid - Director & Writer Milad Tangshir)

circle:

Okay. In my research, I am comparing the two alike but very different art forms which are "conventional film" and "Cinematic Virtual Reality" CVR. Some will categorise them as the 2D and the 3D respectively. But I think "conventional film" and "Cinematic VR" are less confusing. So, I am using the word "Cinematic Virtual Reality" instead of "VR film", but since "VR film" is more common and widely used, we can still use "VR film" for our convenience of communication. Do you usually called it "VR film"? Or you use another term?

Malid:

I really don't distort that much. I mean, this matter when I'm doing it. You know what I mean?

It's a...from one side of course it's important to acknowledge the medium what it is, it's not cinema, and because for many reasons, it's not cinema. But considering we are dealing with moving images, personally I am a film director and also I mainly focus on documentary feature filmmaking, so, for me, it's just a...in a way, it's a continue of telling a story, the emotions with the moving images. And then, I think these terms are...should or would like to help to categorise and make a faster communication. I don't think, personally I don't feel the way of these terms and words on the process anyway. So, 360 film, VR film, cinematic VR, I am all good with all that.

circle:

Right, understand. Okay, so, maybe we will just, for the convenience of communication, maybe we just say VR film. Okay, let's begin with your background. How long have you been making VR films? Or is it your first one?

Malid:

Yes, VR FREE is my first one, which came out in 2019. And then in 2021 I made another one which is called HYDROCOSMOS, which is now run through the festival. It's been out like less than one year. So, so far I have made two virtual VR films, yes.

circle:

Right, interesting. Is that a narrative, a fiction film? The newly produced.

Malid:

No, I wasn't talking about the VR before, I said, apart from VR, I also, I am doing documentaries and feature films apart from VR. But the second VR film that I have made in 2021, it's called HYDROCOSMOS. So, it's be my second experience of virtual reality after VR FREE.

circle:

So, what makes you start to doing the project VR FREE, your first one?

Malid:

Sorry I didn't get the question.

circle:

What makes you to start doing the project VR FREE?

Malid:

I was coming from a long process of a feature documentary that I made, it's called the Star Stuff. It was shot in Chile, Canary Islands. And it was a long and involved process for years. So, I just wanted to, after that, after finish shooting that, and editing, I wanted to do a new experience and to confront my personal new questions, I mean about the language of the medium, the

language of the tool. How does a tool work. How does it react. So, I wanted a new change and new challenge so I started virtual reality. The thing that got my attention was the use of the space, how, the concept of the space. How the space gets hidden and finds a new sensation compared to the normal cinema. Compared to cinema, in virtual reality, you lose the sense of the frame, and the framing, and also the editing, those a little bit in the shadows expected in normal cinema. On the other hand, I think, the space gains massive problem in the virtual reality. At least it was the question I crossed there also, my experience was that. And so I wanted to explore the potential of the space, in a place which per say is filled with dramatic is the spaces like prison. So, I wanted to use this potential of the space in this new medium to explore the nature of incorporation of spaces and to portrait those spaces using the new medium which for me what interesting about the space.

circle:

Very interesting, I'm also interested in space. That's why, actually, my research focuses on space. But I'm researching from a production perspective. Like the filmmakers use of the space in the film production, instead of the work itself. So, as far as I know that you also write the script for VR FREE, right? How does the script look like?

Malid:

In case for VR FREE, it was, the script is just like.... the film that I imagine it, so I exactly more or less 90% the one page which was the progression of the sequence and the scenes, which what was written on the page, I think it's 90% ended up on the film, so it's just for a...and especially

for documentary, if you're talking about documentary, the script it's kind of what you do in editing, you know, of the writing happens in a way, XXX a thing. But here, in this VR documentary I had just imagined the progress of the entrin, the space, the beginning scene and the ending, and the experience of the inmates with the VR headset, also the dramatic progression and the special motive progression is what called in the script in the sgate, which was planned before, I thought before and it's just hard to get to...well I had to imagine.

circle:

Right, understand. So, because I'm not a particularly studying VR FREE but i'm studying the general VR filmmaking process. For your second film which produced in 2021 last year, do you also have script on that film also? Is that a documentary?

Malid:

No, HYDROCOSMOS is completely radically different from VR FREE. And because I didn't want to repeat myself or repeat the experience which I've done well. So, it's radically different, it's the fusion of virtual reality and the language of contemporary dance. You know what I mean? It's like environmental abstracting, it's about the arrival of water, the emergence of conscious life, the XXX of the universe...but this is told through signs, and symbols, and the moving bodies, and the lights and shadows in an uninterrupted kind of performance. So, it's not documentary at all, it's very different from that. And the script was, in this case, I had done it but it's very even more abstract...because you are right, for HYDROCOSMOS it just like...you do not want to reveal your head and the story, as I told you, it's an abstract tail, I didn't want it clear, narrative

or progression, I just wanted people to feel or to guess or to have their impression. You know what i mean? It's an effort to deliberately do not reveal or suggest any clear narrative process. So the writing is just, the intentions, my intentions and also, which is translated into choreography.

circle:

So, it's more like a VR experience.

Malid:

Yeah

circle:

Speaking of the crew structure and the division of labour, what are the differences between conventional filmmaking and VR filmmaking? Cause I saw from your credit list, the DP is doubling up the post production.

Malid:

Sorry I didn't hear clearly the question.

circle:

So speaking of the crew structure, like you have different departments in filmmaking, right? In conventional filmmaking. I am sure there's some difference in VR film crew, so what's the difference of the structure in terms of the structure?

Malid:

Well, I expect, compared to the conventional filmmaking, it's smaller, I guess. Documentary and feature film based on the project you could go on a small crew, that happens, but I think, generally speaking, it's much smaller. I think cinema is also like very much, but here it's even more clear that the crew or the cinematographer, everybody has to have their ability to confront technical challenges. And, for examples, it's a new medium, for VR FREE, for example, we had to find our own solutions about some XXX stuffs, some audio stuffs, because there are missing a few lines of dialogue, in central ...you know, speaker and the other ambience is ambisonic, so it's changes we did position of the headset. So, what I am trying to say that is relatively new, every six months VR making the leap forward, but it asks you to be able to confront maybe complex sometimes complex technical problems, and so the crew has have to that quality, you know right, they need to know, and they need to be on top of the game in the sense about technical stuffs. So, that's one of them, but for the rest, not so much, I mean, because, you need your sounds, sound designer, you need your cinematographer, costume if you are XXX to do that, special set decoration, and everything is like that, more or less like cinema.

circle:

Right, understand. I saw some tubes, when I watch your film, I saw some shots, there're some ceiling LED or fluorescent tubes in the ceiling were off. So, was it deliberately turned off by someone? Or is there a gaffer to do the lighting for your film?

Malid:

Can you be more precise about the example? I can't remember there's a...what you refer to exactly?

circle:

Ah, so, I saw some shots, the lighting contrast is slightly different from other shots, like some tubes are off. So was that off before you film it or you deliberately turned them off for a better lighting for your shots?

Malid:

You mean VR FREE?

circle:

Yes, VR FREE.

Malid:

Ya, I mean, we did not leave anything to chance, I can tell you that, there's a...especially for VR FREE, i thought of it like a series of long takes, the cinema that maybe they do the whole scene

in one shot. The choreography of the space, of the event, the acoustic event, and also the movement, and everything and the distance, so you have to put everything, I mean, everything for me in that is...

circle:

Mise-en-scene

Malid:

Yeah the logic is just this shot, you know what i mean, in VR FREE especially. Not when we are dealing with the space, not the relation with the before and after in a meaningful way, you know what i mean, because these are exerts of these spaces. I really do not remember exactly what the shots the light were off or on, but I can remember that the way I worked and the way we worked, nothing you left the chance, you know what I mean, every detailed is checked before being recorded.

circle:

Right, so actually you don't have a gaffer on set, right? Did I get it correctly?

Malid:

No no no, it depends, for VR FREE, we did not.

circle:

For VR FREE, yes

Malid:

Ya, the cinematographer because it's about the spaces, the nature of those spaces, the prison. But in HYDROCOSMOS it's completely different. It's all dark, and you have a spot, the half light, the object moves around with light, so you know what I mean, it's simply depend on the project you know what I mean. For VR FREE, we took a very naturalistic approach, but in HYDROCOSMOS is completely different, so it's like a dream you know what I mean.

circle:

right, right, I understand. Because I also study cinematography in my Bachelor's I also...when I watched I just curious about these shots "if that's deliberately made or not" Because I'm sensitive to some ceiling tubes that, because I know that people would like to turn off some tubes sometimes. But ya it's just a random question. So, moving on, how was the location scouting? Is there any location scouting or recce for your film VR FREE?

Malid:

Ya, we did get the chance to do a scouting but anyway it's a, for many projects, because it's prison, it's not easy to gain access and have the permission to walk around or wander around to look at the spaces, so the research is very important, but we were lucky and we had a like a walk with the director of the prison, just to look around the spaces. So, ya, we did get the chance to do a brief scouting.

circle:

Did you prepare any shot list or storyboard after the recce or after the location scouting? And if you do, is that textual or graphical?

Malid:

Ya, I had a precise shot list, it was written, simply written before the scouting, cause I told you, it's the imagination of how, I had imagined, and it was a simple piece of paper read like 10 to 12 situations. So, ya, we had the shot list, more or less exactly like that, it was written. But ya, written but I had of course I also mood board and other stuff along with that to especially share with collaborators and others.

circle:

Right, understand. So, when you communicate with your DP, you two just based on the textual shot list and moodboard.

Malid:

No, I had the mood board and also we did the...because for me it was a new tool, it was the first time VR film we did, many texts not in the prison but in the his studio and in the street just...because I really wanted to know, how does these tools react, how does it behave, you know what i mean, when something is in 2 metres away, 4 metres away, when the walls are narrower, when the walls are wide, in artificial light, in actually light, because especially the

camera, in VR, are not, of course, they don't have the quality, and the options of the cinema camera, so, you cannot really depend on what they deliver, like trust with your eyes close. So, ya, we did many tests to exactly understand how do these tools react, and based on that knowledge and those tests, I built up the...you know, or I chose what the camera should be, the height, the distance and the objects, and everything was based on those tests we did.

circle:

Right, great great. So, do you...how did you record the sound on-location? Did you any boom or you just rely on the wireless lav mic?

Malid:

No no of course, we had always the boom, we recorded with the condenser and ambisonic camera, and microphone which is built only for VR, and so we've very cautious because I have a background in music, and also the sound designer, which I worked with, we had worked on STAR STUFF the previous documentary that I did, which came out after VR FREE, it came after VR FREE. So, we were very, we had, I don't know, high standard on our audio if i may say. So, yup, we always have the boom with the mic, so, we had audio for, when the part that the inmates watched the video outside with VR headset, for the reaction, we had also the lav mic, personal radio mic, we could have them. For few ambience even have all the recorders hidden. So, ys, but the boom was always there of course.

circle:

Interesting. So, how did you hide all those equipment or how did you hide yourself or any other crew from the camera?

Malid:

It's also the preparation but....it's simple, you just leave the shot, that's the way you do it, you just leave the shot, and the camera rolls. And this was also interesting for this project, because, you know, we left the inmates with the camera and it sat alone, so it's kind of an experience I was checking out from the key hole. You just leave, that's it.

circle:

Do you have to hide for every shot? Is there any shot that you don't have to hide?

Malid:

I don't know, if VR FREE, we had like 9 cloud shots and the stadium shot in which I am presence, few other guys are presence hidden in the cloud, just to check out the camera, it doesn't get pushed off or pulled over, you know what I mean because it's very crowded scene. But ya you have to just bending or hide, that's easy.

circle:

How did you monitor the image and sound when the camera was rolling? Is there a video village? Where is the video village?

Malid:

No, you simply have the application of the camera on a ipad, on a tablet, or phone that you can almost live with some frame drop or some frame latency, almost live, you can monitor what's going on. But for example, for HYDROCOSMOS, I told you, was kind of performance, everything was dark, we had to just like a wall of black plastic with two holes that would see real-time what's playing in front of me, and then in the video you cannot even...it's completely lost in the shadow you know what i mean. So, you have to find your own way if you need to be in the space to do it, otherwise, you just leave. But as I've told you, apart from that you have the ability to monitor from the application of the camera.

circle:

Right, so, sorry i might have missed it. So, you watch the playback on headset or on a flat screen?

Malid:

On a flat screen, ya. So, I can scroll it with my hand. It's possible. I told you because it's an application, you can use it on a smartphone or put them in a...you know what i mean...the holder, it's a headset like a holder, you put the phone there so in a way you can monitor all on the headset. But I did that when setting up the shots, you know what i mean, when it is recorded, I do not need personally to see on headset live, i see live on a flat screen, because I know what is with line and in flatter screen you can maybe check better the details, you know

what i mean, the lights, the contrast, the thing as a whole, the details you have checked it already in the headset before recording when you are setting up the shot.

circle:

Right, interesting. So, when shooting you watch playback on a flat screen, but before that you had already visualized it on a headset.

Malid:

That's true.

circle:

Right, right. How do you feel about the spatial usage in VR film set? Because you are away from the camera, it's not like a conventional way that when you take close-up, you can be very near to the camera. Like how do you feel about the spatial usage?

Malid:

You mean close-up being at the camera? Or you mean the director behind the camera or to the actor or subject you mean?

circle:

Just from your perspective, like you as a director, ya

Malid:

No, it doesn't now bother me at all, because, as you know, even in cinema medium to high level of production it's many times we are not close to the actor, close to the set, you are at the monitors, and you are watching from it. So, I don't think the distance of the director to the subject or to the camera is such a big issue, you know what I mean. It does not bother me at all. Because it's about the camera, it's not about me. you know what I mean. it's about the camera, the camera is there to see my eyes, the eyes of the camera, and everything should be thought and prepared for the camera. What you have done, before we have done it, so everything, the work is done before the camera starts rolling, so in a way, at least for... i'm talking about VR, so it's not a problem for me.

circle:

Right, understand. It's interesting that you say it's about the camera, which is actually is true because different directors have difference practices, some like to watch the VR, watch the monitor, some like to watch the live action, the live performance. Ya, but actually when it comes to performance, it's the same. But when it comes to the work, the video, it's actually about the camera. Right, ya, so far I think we have covered a lot of interesting areas, so to conclude today's interview, can you describe the biggest difference between your role as a VR film director and a conventional film director?

Malid:

The difference is...well, something at the beginning I talked, I think it's about the language, you know, first is about the language, the language of cinema and the language of VR, which they have lots of common grounds, of course, that's why lots of great film festivals all VR session, because there is a continuum with the cinema. So, as I told, I guess the framing, the sense of frame which has established the visual art at least in western part of the world, it's the sense of framing for centuries. And you do not have this in VR, you know what I mean. This is a big changing about the language. Now another thing about the language, as i've told you, is editing, the montage, you know what I mean, which is a very huge part of cinema. It's very marginalised compared to cinema in virtual reality. Does that mean it, it does cannot have its FX or force, of course, that was a film. But also, that's another thing, that compared to conventional cinema, VR acts in a completely different way. So, that's why I think the editing is the movement of the viewer, the editing is inside the shot, i think it's inside this 360-degree sphere. But it doesn't mean that you cannot do it, the director should make the viewer do his or her editing in that space based on how the director choreographed the space, you know what I mean. So, the space and the editing and the framing is also very important. Another thing is also about the flouation, because cinema can be, it should have been about the shared experience, about the...you know what I mean...but virtual reality, although there are like experiences you have to do in 2 or 4 people etc, but it's kind of individual and intimate and personal experience. It relates a lot to me to the realistic nature of the medium and the way you see it, experience it. So, it is, I think, at the end of the day, an individual experience, a personal intimate experience which is completely different, at least, to when the cinema started and how it's done. So, I think

this big difference in the way of fluctuation comes back and put VFX also on the way of making it and how you think of it, I guess.

circle:

Right right, great great great. I also agree that actually VR is very personal because you are actually looking into a headset. Like because VR is meant to be watched in a headset right in the first place. Ya, but how about the, in terms of the production? Like production-wise, when you film it, your role as a film director, any big difference? Do you feel any big difference?

Malid:

Ya, of course, I mean, you should be... it's a balance, as I've told you, I not consider myself as a film director, I am looking to, mainly to hope to progress my works in commercial films as we called it. But when I'm doing VR, I'm really interested to think about VR, I mean, I just don't want to bring the way of thinking, so ya, in the production, it's decision you make, you know, creating something is about making many decisions, I guess. And these decisions have to be coherent among them, and to have a reason behind them, even maybe you change your idea or... you have to know why, yes or no, yes or no, yes or no, and this is a no, it's different from commercial cinema to VR. So when you are, personally, when you are doing virtual reality, you just have to respect the medium, and its own language. So, the difference is in each every any single decision, you know what I mean, you just have to know that is completely another game, you bring own your own language of case, your own experiences, what you have seen or what you have wrong with, that's true. But you have to just satisfy, that's what I told you that, I do VR

because I want to do some ...I just had to have a new breath of where between my film projects. So, for me, VR virtual reality is just about thinking completely different. So, I don't know if I could respond to your question. What I'm trying to say that is about whole the decisions, and all of them are different. Production-wise, no...the scouting...the planning, you know what I mean, the work of the assistant director if you have it, the work of the producer, the work of the set, and the work of the sound, and...you have to have it you know, if it's possible, you cannot do it....it's about creating something that needs precise planning, you know what I mean, to arrive them. But when you arrive them on set, production is...if you have to follow new rules, you know, you have to respect the rules of the game, that should doing.

circle:

Right, understand. Thank you so so much for all these insightful sharing. For me, I have covered all the questions that I would like to ask. For you, do you have anything you want to share about your work, the production, just anything?

Malid:

I don't know what to say, I mean, from the production point of view, I guess the technology is improving very fast, so many solutions are being made based on the projects, based on the needs of the artist, so that's a good thing in virtual reality. I think also the distribution and the ways of fluation are a great challenge to overcome, I mean, I think the accessibility and how easy it is, for me, is the biggest problem of virtual reality right now, not the production, ya. Because the production-wise, you have great stuff and great freedom and technical ability for

animation or computer graphic stuff, while 360 video is still very much behind in quality-wise. And the standard of the industry, in that sense, for me, is still poor. We were shooting at 8K but the dynamic range, but how the light works about the colors about the depth of a information that the camera records, these are very poor standard in virtual reality. But apart from these technical aspect, I think we need huge advancement in the ways of fluation, to make it more easy, light weight and most natural way cause images, about the fluation, I think that's the, maybe, the biggest challenge now.

circle:

The fluation?

Malid:

Ya ya how you see it, the fluation of the work by the audience, you know what I mean, the accessibility of the hardware and software, and how this experience is comfortable and easy for the medium, you know what I mean

circle:

True true, because there're quite a lot of limitations for now. Right, understand. So, ya, thank you so so much for your today.

Malid:

No problem, I hope it can be helpful for your work. And good luck

circle:

Ya, it's definitely helpful. Ya, I would like to talk more about on your work. I guess we have to put an end for today's interview. And I good luck to your next film or your last VR film. I'm very grateful

Malid:

No problem, I always can be helpful for you and good luck for your project.

circle:

Thank you thank you, I will see you

Malid:

Thanks a lot. Write me if you need anything or other questions okay

circle:

Right, sure sure. Thank you so much for your support. Bye bye

3. Director & Screenwriter HO Wi-Ding 何蔚庭

CVR project: Look At Me 看著我

360-degree, non-interactive, fiction, live-action

Duration: 14 minutes

Release Year: 2019

Director Ho Wi-Ding is a Malaysia-born Taiwanese film director. *Look At Me* (2019) is his first attempt at CVR storytelling. *Look At Me* (2019) is a sci-fi 360-degree CVR that portrays Zhang, who failed rendezvous with his virtual-world-addicted girlfriend, suffered from cybersex and chose for a physical fight engaging 'real interactions' in the end. *Look At Me* (2019) was selected for the 2020 Festival de Cannes Marché du Film, 2020 SXSW Film Festival and 2019 Kaohsiung Film Festival. *Look At Me* (2019) was filmed by a 360 camera.

(circle - Interviewer; Wi-ding - Director & Screenwriter HO Wi-Ding)

circle:

Okay. In my research, I am comparing the two alike but very different art forms which are "conventional film" and "Cinematic Virtual Reality". Some will categorise them as the 2D and the 3D respectively. But I think "conventional film" and "Cinematic VR" are less confusing. I am using the word "Cinematic Virtual Reality" instead of "VR film", but since "VR film" is more common and widely used, during our interview, we can still use "VR film" for our convenience of communication. Do you usually called it "VR film"? Or you use another term?

Wi-ding:

I...I've only done VR once. Because it was commissioned by VR Lab in Kaohsiung, so...it's a new thing for me, i was interested, so...but I don't know what they call usually, but all I know is, you know, normally I'll tell people I do a VR film, you know. It's a VR film, it's a 3D film, it's a 35mm film, it's digital film, so....ya, it's VR film, I think. I don't know, ya but, because I don't have a chance to talk to more people about VR project...and also because of the COVID thing, we were supposed to go to self by self some festival with the VR, but I didn't get the chance to go, so, I never really meet with the people.

circle:

Maybe there are many many different definitions nowadays, especially in the academic world, so, I think we can just use "VR film"

Wi-ding:

Ya, they are AR or VR, and even the festival sometimes they a different categories.

circle:

So, this is your first VR film, what makes you start doing this project? How do you choose from one to another? How do you choose from doing it in VR instead of the conventional way?

Wi-ding:

It just basically one day the VR film lab approached me from Kaohsiung, that's the one you talked to. I've never tried VR before, I was just curious, for me, it's a new technology, so, if I can get a chance to test it out, because the good thing about this is, it's only short film, so I don't have a lot of pressure about trying to make it happen, you know, it's a short film, it's a showcase, so I took the chance and trying to see whether it's good or not.

circle:

Right, understand. So, you wrote LOOK AT ME, right? How does the script look like? Is it in textual form or it's graphical?

Wi-ding:

What do you mean? It's in a word form, like a regular script.

circle:

Okay, regular script in textual form. Okay

Wi-ding:

The whole story...I always, you know, I had another story, I was having a...like a story, and then...the way I was think is more about conventional scriptwriting, so, you know, I have those like "okay let's cut to the close-up and then from close-up to this close-up and ..." Then the people at the lab was like, you know, "okay Mr. director you cannot really cut too quickly, with the VR, people could have get dizzy, because it's a immersive experience 360 degree, so you

have to...you cannot do cutting." It's like...they are like no editing, that's why when you see those couple talking in the restaurant, normally we will go like "let's cut him and cut him", right, editing his face her face, but during that scene, I can just only have to do it like the whole wide shot, so at first, when we present the first story it was more...how to say...it's more intense, it's more action-oriented, though the lab people said "you know what, this is a bit much for people, so, you wanna reconsider, you know, make it shorter or make it less happening?" You know, so i came out with the other story, ya

circle:

Right, understand. So, the script is a regular script. But how did you visualise the script to other crew members like the VR cinematographer, cause you're not shooting the conventional way, instead you are shooting 360, so how did you visualise the 360 to them, visualise the story to them?

Wi-ding:

What I do is...in the script form, because normally, even when you write a script, it's always scene by scene, right? Normally when you write a script, you don't go crazily with the "oh close-up, medium shot, wide shot" you don't do that in a script because you will get annoyed by a script that has so many film language. Cause you don't use a "POV, top shot" you know it's really annoying, how do people...because when people read the script, they want to read the story. So, it's actually not much difference because of...okay when I write the scene about the couple in the restaurant, it's a regular...."oh they are eating" right, "they are talking", so people

know that, and then even for actor, it's the same thing, is, because, they know they have to do the wide shot anyway, normally conventional way of making a conversational scene it's always wide shot, right? Two people talking, you cover this, you have master, we called "master", and then after "master" you cut in close-up of the guy and close-up of the girl, so in this way, it's a "master", so it's a same thing for me as a shooting the regular thing, right? And then for the crew, you know, you just have to prepare what's going on in the scene, it's the same time, you just have to find the location. The only crazy thing is, normally when we look for location, sometime you find something really good on one side, right? You don't have to worry about the other side, because the regular film is only "this" (one directional) But when we looked for location in this film, we have to constantly looking for 360 degree whether it works because just in case, the people who are watching the film want to look the other side, right? So, location-wise, when we looked for location, it's kind of...you are more involved to pay attention to the surroundings. Because normal shooting is only one side, because you light this side, like even though there's a lot of people, garbage, the ugly building at the back, it's fine because you're not gonna see that. But with this VR, you have to be careful. And the other thing is the actor can play with the action more, I don't know if you know that when they are in the motel, the guy was like by the bed, the girl was in the toilet, and then they are talking...you know it's kind of like a theatre play now. You know in theatre play, you don't have a close-up to let the audience "oh I want to pay attention to him or her" right? The play, so you see all the actions going on, and you decide where to pay attention to. So, I was playing with the idea that things happening so much, whoever wearing the VR have to like "Okay, should I listen to him or should I listen to her?" So, that's the only difference, I think. And also the good thing, you don't have to

edit, so it's like, you finish it you finish it. And then you just have to put all the shots together, so during editing it's so much easier.

circle:

Oh, really?

Wi-ding:

Right? Because you don't need to like cut close-up, ya, so, it's like one scene one shot, right, so ya

circle:

It's a long take. But I thought the VR editing is more complex because you have to stitch the lens together? Or it's a technical thing?

Wi-ding:

Ya, you have to stitch it together, it's a big process. Also, you cannot like use "this" (handheld shaking), the technician go crazy, you cannot do too much of the handheld.

circle:

right

Wi-ding:

Ya, so it's a lot of ... and the camera cannot move too much, you know

circle:

Right, understand. So, back to the topic of the script, did you prepare any shot list or storyboard to like enhance the communication with the crew members?

Wi-ding:

Of course, ya. It's basically...because my habit is always...I like to use words to write the script, there's no storyboard. So, when I find the location, when I do location scouting with the cinematographer, with the crew, I just tell them right on the spot like "this is what I'm gonna do", you know. So, the guy has to come out with the elevator, he walk out and then he look off screen, we have to pan with him, and see what's going on with the fighting. So like "this" (hand gesture panning the camera), and the crew will write down the notes and everything, ya.

Because it's very hard to do storyboard for VR.

circle:

Right, very hard to do so, like what...why is it hard to do storyboard?

Wi-ding:

Because it's all like a...because when you do a lot of cut, a lot of shots, you know, like action film, you know like car chasing, this angle this angle this angle...you can use a storyboard to write out, the close-up of the driver, the close-up of the guy being chased, the passedby

screaming, you can write those, for people know what to do and what to prepare. But for this (VR), you just imagine that, on that day, you have to do a theatre play, you just record it like a theatre play into a camera. The main thing is the placement of the actor, how they walk, do they walk from the left, from the right? You know, those kind of thing is very hard to write in storyboard, I mean you can just write a general outline, like a floorplan. Also with VR, you can only slow pan, like “this” (hand gesture), that’s it, you cannot do much, you know, even I was told you have the dolly, it’s very hard for the post-production people, so that’s why I don’t have dolly, I only have like camera, like “this” (hand gesture of slow pan), slow pan, ya

circle:

Right, understand. So, you had a floorplan instead of a storyboard? Can i say that

Wi-ding:

Ya, I mean, even when I make feature I always do the that, it’s easier for me.

circle:

Oh, okay.

Wi-ding:

It’s my thing. I’d rather write “oh this is what the camera look like” (hand gesture) and then you write the floor plan of the living room, the guys is “here” (hand gesture), the guy is here, and then the camera is like shooting “this way” (hand gesture)

circle:

Right, right, understand

Wi-ding:

It's easier for people to see where the camera is

circle:

Right, right

Wi-ding:

But because my film doesn't involve a lot of special effects. But if you gonna have to do a lot of special effects, it's better to write a storyboard, you know

circle:

right, understand. So, coming to the production crew, like how did the production crew form?

Like how did different departments come together for this project?

Wi-ding:

It's a usual crewing up. But because of our budget honestly is not great, it's a short film and we have limited budget, so you just have to think about...it's a student film crew. And then we are working with FUNIQUE, in Taiwan there's a VR specialised VR company called FUNIQUE,

basically the camera is from them, we are doing post-production with them, so, camera-wise I don't have to worry too much, you know, and the rest, the lighting, the casting, the art directions, it's all the same.

circle:

It's all the same, oh

Wi-ding:

And then we are working with the cinematographer who is from the VR company, you know, because he knows the technical problem, ya, so it's some ...no it's the same, not much difference. The only thing is, you have to be aware is on the set, people always hiding behind the camera, right? There should be a lot of people behind the camera, because director looking to the monitor, they all stand behind the director. But when we are doing this scene, the problem is because 360 degree, so every time when you say action, you see the cameraman press the play button and then we have to hide. We have to....nobody can see us in the 360-degree.

circle:

Right, where did you hide?

Wi-ding:

You have to find the other room. Ya, so that's why when you look for location you have to be careful. You know

circle:

Right, that's what you have to know in location scouting.

Wi-ding:

Ya.

circle:

Okay. And also, the production stuff, everything just together with monitor village, the video village? Everything in one, like, for example, like one small room beyond the frame? Frameless frame?

Wi-ding:

Ya, I mean like normally, you know, you can have the crew, as long as you don't see inside the frame, they can do whatever they want, you know, as long as you don't see them in the frame, they can be anywhere. But now with 360 degree, even though I'm shooting the couple talking on the table, right, but the rest of the location you have things going on, you cannot have see a sound boom man, or some guy...so, basically, looking for location we have to be aware, you're gonna see everything, so, you gonna find another space for the video village, for the monitor, for the crew, for the director. So the director cannot be on the set with the talent, you have to

like hiding, ya And I think the people acting feel good, because it's like, I might think about usually when you act, if you are actor, when you act, there're lot of people looking at you, because there're so many people behind the camera, right, tend to be like 10 20 people looking at you acting, but with this, I think talent would feels very free because you're acting in the room there's no one watching you, right, for actor they feel secured because, you know, even the intimate scene, you know like sometime you have a bed scene, like really intimate scene, if you think about when you do those actions so many crew looking at you that's pretty strange. We use VR, we have to hide out, we have to all hide, so you're not gonna see all of this, you know, so, I think that's the far side

circle:

Yup, so speaking with the sound recording, I saw a boom operator in the credit list so how did you get the boom out of shot? It's a post-production ...

Wi-ding:

You just have to put to the...(hand gesture) camera ...how to say...

circle:

On top of the camera?

Wi-ding:

ya

circle:

Oh okay, okay actually there no any boom man holding the boom

Wi-ding:

No, cannot, no way, ya

circle:

Ah, okay

Wi-ding:

The only place you can hide, I don't remember it, like two years ago, you only way you can hide is actually underneath the camera. You can stand close to the camera, but I think in the post you have to erase that guy. I don't remember we do that or not, so, honestly, it's been two years, so I don't know

circle:

Right, right, it's been a long. Okay, so talking about the hiding yourself from camera, so how did you monitor the image and sound when the camera was rolling?

Wi-ding:

I remember you cannot like the regular stuff you watch it live, you have to...they...when I say cut, action finish right, they have to render the whole thing for me, I remember every time I look at the playback, they have to render the rough footage so that have to wear the VR helmet, and because everything is not done yet, like you say the stitching thing is not done, so when you look at the VR, it's like, it's really rough. You have to like try to use your imagination, and then, because every time when you want to, like normally when you show your actor what to do in the next take, everyone can watch the monitor right, but if you want the actor to look at certain action, you have to playback and his has to wear the helmet, it's a bit troublesome, it's a bit longer process when you watch playback. And also I think if you don't wear the VR helmet, it tend to be like a 260, you know, on a monitor you gonna see...when you flatten the VR image, there's always a stripe in a whole....you know when you use your iphone to do panorama, I don't know if you have done it before, it's like (hand gesture), the accent is like this, so it's very hard to imagine what's in VR.

circle:

Okay, right, so actually don't watch it on a flat screen, but you watched the playback on headset.

Wi-ding:

ya

circle:

And it takes longer time

Wi-ding:

Ya, you have to, because rendering, and playing, and taking off the helmet, and also the helmet is not really comfortable

circle:

It's true

Wi-ding:

You're not to the point that everything is so easy to use, you know, it's like huge, you know

circle:

Ya, it's still the limitation of this technology. May I know how far is it, like generally...I know there's no standard of the camera and the video village or where you hide, but normally like how far, what the distance between the camera and where you hide?

Wi-ding:

Where I hide?

circle:

Is it far?

Wi-ding:

Far, far, you cannot be inside the frame.

circle:

Can you give a concept like how far is far? Behind one wall or you have to like remotely...you have to go a remote place?

Wi-ding:

No, it's a next room, ya. For example, the restaurant, at the back of the restaurant there's another room, so we're all in that room, so it's quite close. As long as you have something to, you know, we can hide behind a wall, it's fine too

circle:

Ah, okay, just behind the wall, it's fine

Wi-ding:

Ya, it's just for the look, it's not like for the technology thing you have to be far far away, no no

circle:

Right, understand

Wi-ding:

Even you use a fake chair to cover you is fine, you know, it's like, even, for example if I have a chest, a TV set, if I hide behind the TV set, it's fine

circle:

Okay, so, it's just for the image

Wi-ding:

Ya, it's just that when you have 360 degrees, it's very hard to hide, ya

circle:

Right, okay, so the next question is, I notice that there's no gaffer in the credit list...

Wi-ding:

sorry?

circle:

gaffer

Wi-ding:

Gaffer, ya ya

circle:

So, did the VR cinematographer double up the role as gaffer or...is there any gaffer?

Wi-ding:

Do I have a gaffer, I don't remember...we do have a gaffer...so it's no gaffer in the credit? I

don't remember we have a gaffer. I think what we do is um....because you cannot have movie lights, the only light you could have is a prop light, you know table lamp, the whatever you see on the set, and the production designer will take care of it. Meaning that normally in the movie set, you have two kinds of light, right? one you can see in the frame, we call practical lights, you know, it's like...it's a lamp you see on the set; another one is off-screen, it's big movie light, you cannot see, right? But with VR, you cannot use a gaffer to do that, so, the production designer have to take over, meaning when the production designer, when he visualise the whole set, he also has to visualise the lighting.

circle:

Ah, so actually the production designer have to manage the practical lights and lighting

Wi-ding:

Normally, even in the regular movie shoot is that. It's just because it's only one side, one framing, right, the cinematographer can always bring in the movie light to enhance...okay let say when you have a close-up, right, because it's only close-up, so the DOP will always bring some light to make some lights on the actor or to make him look pretty. But when you have 360

degree, we cannot have a movie light, so you gonna end up...I think I've...at some point we were talking about hiring someone, and then we realised that it's not practical, I don't remember the details now, I think we might have someone, anyway

circle:

I saw two film lights rigged up on the ceiling in the fighting scene, the two spotlights. Is it available light, or is a set?

Wi-ding:

Ya, you know what, I don't remember, I think it's a practical light, it was supposed to practical light, it could be, seriously I don't remember ...the other scene is basically, I mean, that's why we are looking for...we spent a lot of time to looking for location, because we have to make sure the location is well lit, you know, without movie lights. You cannot do it in a dark warehouse, if you don't have enough light, so, it's like, that's why we put those couple next to the window, but the restaurant on the second floor right, and then you can feel the restaurant is kind of like in the outdoorly space, i think because the roof is glass, so there's some light coming in. So, we were looking for something bright enough so that we don't even need to use light.

circle:

interesting

Wi-ding:

Location is tricky for VR, you have to look for light is enough, 360 degree, ya

circle:

So I can say the lighting setup is very minimal?

Wi-ding:

ya

circle:

Mainly is available lighting

Wi-ding:

Ya, ya. Say production designer have to somehow take over the illumination of the set, you

know, ya. Even if they, if you have a gaffer, they probably have to talk to the gaffer about what to

do, like beforehand, ya

circle:

Right, understand. Can you explain further a bit more about, of how you and the

cinematographer decide where to put the camera? what's the communication?

Wi-ding:

You have to put, basically as long as you don't block the actor's action. It's like... I don't know if you know a French term "mise-en-scene". In regular movie, sometimes you don't have to move the frame all the time, if you look at the old hollywood film, it tend to be, the camera doesn't move but the actor can move from here to here (hand gesture), they are like doing some kind of dance you know, we called "mise-en-scene" so, it's kind of the same thing I can do, so you know, in the motel room, right, when the guy fed up dressing leaving right, because his girlfriend is in the toilet doing her business. So you have to make sure when you frame it, you can see two actions in once. And when the guy leaving, you can also follow him. So in a way, you have to put in the area that... if you want to use a cinematic term it's more like a voyeur, audience is the third person in their room, like voyeur the secret life, you know so im hiding looking at them, could be like that. Also we are playing the idea...when the guy punch at the end, trying to punch another guy, I think got having him to...to have someone close to the camera, you know when you do the action beat, in VR when you're closer, more impact, you know, right? So, we are trying to, I mean we are just playing with the space in VR, it's like you can have 360 degree, you also can have something, because it's a wide angle so when you have the action bringing into the camera, it's very impact, so...we're just playing with the, I mean, you know, for me, when you make, when I do that it's more like a test, testing the technology. So, I was exploring all the possibilities.

circle:

Right, right. Did you do the...did you have a test shoot for the fighting scene, because it's lot of mise-en-scene?

Wi-ding:

No, we don't have enough time much. Basically we have to like do it that day and test it out and ya. I mean seriously I wish we could have more people and more action...density, but we really don't have a lot of money, ya, because Kaohsiung doesn't give us much

circle:

Haha, it's because of the budget

Wi-ding:

And also the VR post-production is really expensive. All the stitching thing. Ya, it's really expensive

circle:

Right, is the post very expensive?

Wi-ding:

Ya, VR is very expensive to do. It's not easy to do it for commercial purpose because you cannot be too long, I mean everything is like you get dizzy after 15 mins. And then even you want to look at the short film you have to ask Kaohsiung people, you have to download the software, I mean it's just like...you know what, I don't even see my film, yet

circle:

Yet, ooo

Wi-ding:

After the post-production, when they show it in their... we called VR cinema, I didn't get a chance to go there and watch it. So you actually saw something I haven't seen before. Meaning that you download the file, you have the software thing right, I don't have a helmet so I cannot see it. This is how crazy this medium is. It's so hard to make, it's expensive, it's only 15 mins, you cannot do too long, people get crazy, and you cannot watch it when you want to watch it, ya

circle:

Right, so it's definitely they spent more budget on the post-production, VR post-production than on location shooting?

Wi-ding:

Ya, because, also as you, I don't know if you get the chance to get other VR short, they tend to be, when a lot of people do VR short, they do in a way more like art installation, piece, they do it very like sci-fiction, special effect, animation, you know, they all do it in a ...you know it's very computer stuff, they all post-production, you know, galaxy or ocean, all crazy fantasy work, it's no real, it's not real, and sometime it's like a....one of my my did dancing, dancing animation, installation...they never do like me, story. So, narrative is very hard to do in VR, ya

circle:

I understand. It's all about the limitation of the art, of the form

Wi-ding:

Ya, so

circle:

Um, how was the directing...screen acting directing different from conventional screen acting...ya, how was the VR directing different from the conventional directing?

Wi-ding:

Oh I had a easier time on the set, because I don't have to, like you know, normally when we finish one master shot, we have to go in (hand gesture) and then do the close-up, right. And then, during editing you do crazy because you have so many coverage. But here once you have one good take you have one good take, you know. I think the burden is on the actors now, basically they don't have any coverage meaning that...when the couple talking, they have to be good, because something when you do a regular shooting, if the man is good and the woman is not good, you can always do close-up to compensate our mistake or acting, to do editing to kind of compensate some mistake. But this thing cannot, you just basically...two people talking in real life, you cannot go wrong with that, you know. I mean, it's like, you have that take, if you screw up a line, you have to do it again

circle:

Right, right, understand

Wi-ding:

You it's hard for the actors, it's easy for me on the sense, ya

circle:

Did the actors have VR filmmaking experience before?

Wi-ding:

No. But it's not much difference, I guess, before it's the same acting, you know, it's more free from them if they can handle acting, because if you somehow without no acting experience, of course you're gonna be, have problem saying all the lines at once, right. But if you have experience in theatre acting, that's fine, ya

circle:

So, any special thing you ask them to take note of? Like the camera distance, the stitching lens... nothing?

Wi-ding:

No, they don't have to worry, ya. They just basically, they have to know where they have to go. I mean it's the same thing as mise-en-scene, you ask the actor come in through the door, walking from right to the left, so you know, I think it's fine

circle:

Right, understand. How do you feel about the spatial usage in VR film set? Like the distance or communications, like about the space, how do you feel about the space in VR film set?

Wi-ding:

I...for me is very...the problem of the space is...(hold on lemme turn on the air-con, hold on)

circle:

Sure, sure

Wi-ding:

The space...I'm not comfortable with the space, it's because you are doing, you know, you have a 360 degree space right? But normally when people...the human being is built with the eyes to look in one way, right? So, it doesn't matter, regular film or 360 degree, you still have to have something that guide the eye, you know, you still have the major element, I mean, in the way is not as democracy as the thing it is, cause we thought 360 degree, the people can, the viewer can choose where he want to look at, I don't think it's...the right thing to say, because unless you're doing nature documentary, you know, okay, I know the detail with medicine purpose, put

the tube inside your body and look at, you know, so if you are, for exploring purpose, if you want to bring your camera under the sea for really deep and let the audience feel the world, it's fine. But anything you want to do with artist statement, meaning that even though you do a art installation, you do a documentary, you do a narrative short, that mean you have a point of view, right? Once you have a point of view, you gonna have to build a narrative guideline to guide the audience to follow your whatever you want to say. With that, even in 360, you have to pick a spot to make sure people to go that. So, in a way, why do I do 360 degree? So, it doesn't make sense to do narrative in VR

circle:

Right. I kinda agree for some, for most of the narrative la

Wi-ding:

At least you're doing a ghost movie, maybe you can horror film maybe you can do it in a way that you bring a person into a dark room where the ghost gonna jump out right? But once the ghost jump out, you suddenly start to follow the ghost again....just...ya. VR only works for, I think, scientific purpose

circle:

sci-fi

Wi-ding:

No, not even sci-fi, it's like a research purpose

circle:

I see, it's more on application

Wi-ding:

Medical, biology...

circle:

Pilot training

Wi-ding:

Pilot training, and the space, you know, it's like exploring purpose

circle:

right

Wi-ding:

Anything about telling a story I don't...even for dance piece you know I'm, I mean you have hunch of dancer dancing around you, you still have to look at the lead dancer, cannot look at it you know it's like...because you have the lead dancer already, so it doesn't work for art, I think, that's my opinion

circle:

Actually I feel the same, because the very first time I watch a narrative film on a headset, it's a action short film, and I couldn't watch it twice because I know the ending already, but I missed the very important action, because I keep looking around, finding who, finding the person who shot, who fire the gun, but actually it's over already, the action is over already, and I know the ending already, so I cannot watch it again the see the most important action, so...ya I mean I'm studying virtual reality production but...ya that's my personal feeling lah over the narrative of VR

Wi-ding:

I think the filmmaker failed because if he is good enough, you always gonna find the guy, because you have to drop some hint for people to use sound, something, to look at the way...ya that's why were plaything with the sound and everything, you still have to play with the sound to you know, let say you have a direction of sound coming in here (hand gesture), so that you can look that way (hand gesture)...that's a lot of things to do ya

circle:

Right, a lot of coordination. But it was a very early stage of narrative VR, so...ya. But back to the production side, how do you feel about the space between the equipment or the set or the actors? Like on set, how do you feel about the space, what do you find...do you find any difference between conventional spatial usage and the VR film set?

Wi-ding:

I mean, if your crew is not organised enough, you tend to see a set is really chaos, meaning that you see your C-stand on the floor, you see your equipment. For director, if it's a small space, it's very hard to focus, because you have some many distractions, equipment, crew, standing there, looking at phone, you know. But with shooting VR, the good thing about it, like you know "guys you cannot be there because will see you everywhere, so please hide" you know, in a way, it's so clean because for me I can...It's only me, camera and actor talking. And even for the actors, I am sure the actor sometime get distracted because in normal shooting, and when you're talking, and then you see a gaffer is like maybe smoking or drinking, you know, far away in your eyeline is like doing stuff, it's hard for the actor to focus because you're acting, and then you suddenly see a, some crew, you know, because they don't have the sense of a...we called "in talent's eyeline". When you're in talent's eyeline, it's very hard for them to focus. It happens all the time with the crew that is not professional. But in 360, I'm sure the actor will be like, when he's acting he's acting, there's no gaffer or you know. There's no one behind the camera too, there's no DOP. You know there's no director looking at you, so I think they might feel better because I'm not actor I don't know, you know, but I'm sure they will feel much better. And I feel much better because I don't see any equipment or cable, also the cable, you know, on the movie set, the annoying thing is the cable on the floor. So it's like, when you shoot VR, you cannot have cable. That's for me the good thing

circle:

That's very interesting, because I think the pace of shooting is very different, because in conventional filmmaking, for example like action film, there're lot of things happen simultaneously, like putting the dusk, pulling the wire, cueing call, someone talking in walkie talkie, because no sound recording ma for action films. But like for VR you have to roll, act, stop, then watch playback, it's like the pacing is very different, it's very independent, like each shot is very focus, very organised

Wi-ding:

(nodding his head) Ya, I mean, it's a nice style, it's very quiet, you know, not very cinematic style, so it's...I mean, thinking back, I have a mixed feeling about doing VR, you know, telling story through VR...if you ask me doing it again I won't mind doing it again, I'm just gonna have to come out with a better story to make people go more immersive. But at the same time, it's really...is the process, it's not the normal pacing that I'm used to. It doesn't feel like making a movie, ya, like to say, it's a...I don't know if you know some Taiwan filmmakers is like really...侯孝賢 which is a master of...he is famous for long take, it's like LONG TAKE with all the scenery, the mountain, the river, one take don't move, I think he might be okay to do the VR thing because just like you know one take, nothing happen. Ya I mean, might be a good thing for him, I think it's a good thing for him to do that, ya. If your style is like long long take style, I think you might be good, you know, because it's like, you don't move your camera, the camera the story is not action oriented, and then maybe the audience can go into your world more, right? So, I don't know

circle:

I think today we have covered a lot lot of interesting ares so far, to conclude today's interview, can you describe the biggest difference between your role as a VR film director and a conventional film director?

Wi-ding:

For my personal opinion?

circle:

Yup, your personal opinion

Wi-ding:

I mean I'm not gonna do VR for sure, it's because for me, like I told you before, telling story in film medium, you know, you have a point of view, this point of view including how big is your framing, the size of your lens, you wanna be tight or, this is a choice, and then when you cut off, you know when you take a photo, right, you put yourself into that position that you are the author of the frame, when you take a phone of yourself, even selfie right, even selfie you have your own opinion what you should look like, so it's very...it's your thing to decide camera the size, the camera lens, bigger or smaller, how people going in and out, using a dolly or not moving or moving, you know, all that are creation of art for me, as a artisti, this is what...this is the medium we should, I should embrace to tell a story. And then, of course, you cannot overlook editing, editing is part of filmmaking right, editing is the thing that... the only thing

you don't feel like is real because real life people don't edit your life. So, ya, for me, it's already pretty hard for me to tell a story in 2D, in a regular sense of filmmaking, I don't have time to deal with VR, so ya

circle:

It's kind of handover the choice for the audience

Wi-ding:

Of what?

circle:

You handover the creative choice for the audience

Wi-ding:

No, because the...you cannot handle...you cannot let the audience to decide because you've already decided for them, you know, even with VR, it's the same thing, you put your main actors in front of the camera already, right? So, for me, as a storytelling, you gotta have a position, but with VR you cannot have a...you know, with VR, you can still do it...I mean what's the point of doing VR if you can do it in 2D? Ya, but again, this is a...I don't know if you know this virtual production technique stuff coming up? You know with the LED

circle:

Ya, shoot the LED wall

Wi-ding:

So, I mean of course it's not VR, but the way they're doing it now is more like the ...

circle:

Replacing the green screen?

Wi-ding:

Ya, on the set, you make it more like real life, because you have all the things coming from the LED screen instead of the green screen. It's very immersive for filmmaking, but is not 360 degree, that for us is fine, because we're still doing the one, one direction

circle:

Can I ask a random question, like, is it very quiet on set? Because usually on set, sometimes we shout...the communication is very verbal, we always use walkie talkie, or we shout out for instructions, or any adjustment of the shot. But for VR, cause the camera movement is lesser, the lighting setup is lesser, is it very quiet on set?

Wi-ding:

I have a quiet set no matter what I do, so, I believe VR is very quiet, because you don't have much to do, only the camera guy set thing and then everyone hiding... I think ya, and then

director talking to actors what to do...ya, I think so, it's quieter ya. But for me I don't feel the same, because I always have a quiet set, so, it's fine.

circle:

I see. So, I think we have covered a lot of interesting areas today. Thank you so so much for today. I really enjoy the film, it's very cinematic, actually it's the most cinematic live action VR film that I have ever watched. I don't watch much, but I love it...and I believe that today's interview is very helpful to my research study. Ya, that's all for today.

4. Director & Screenwriter Alexey Marfin 馬樂思

CVR project: Kowloon Forest 靜觀九龍

360-degree, non-interactive, fiction, a mix with live-action and computer-generated graphics

Duration: 8 minutes

Release Year: 2019

Alexey Marfin is a professional visual effects artist based in the US and Hong Kong. *Kowloon Forest* (2019) is his first CVR directing work, which is a portrayal of the private lives of five strangers in Hong Kong, exploring the intimacy moments in a city of density. *Kowloon Forest* (2019) won the Best Live-Action VR Film in the 2020 Vancouver Film Festival and was selected in the 2019 Kaohsiung Film Festival XR Dreamland and 2019 Busan Film Festival. *Kowloon Forest* (2019) was filmed by Black Magic Pocket Cinema Camera 6K. The live-action footage was mixed with computer-generated graphics.

(circle - Interviewer; Alexey - Director & Screenwriter Alexey Marfin)

circle:

Um, we're using these two words "'conventional film" and "Cinematic Virtual Reality" in my study. Some categorise them as the 2D and the 3D respectively. But "conventional film" and "Cinematic VR" are more appropriate in academic research. But since "VR film" is more common and widely used, we can still use "VR film". Do you usually called it "VR film"? Or you use another word?

Alexey:

I think “VR film” ya, sometimes “VR experience”

circle:

Right “VR experience”

Alexey:

Depends...no I found it “VR film”

circle:

Okay, okay, let’s do “VR film”. And, so, let’s begin with your background. How long have you been making VR film?

Alexey:

This one was my first VR film. But, I think, I did some kind of experiments for it, because my professional background is visual effects. I work as a visual effect artist, can compositing so, I think I also interested VR, I was curious. But this is my first time doing this kind of big project, which happend to be my personal film since i’ve done some commercial work, you know, for other people, VR, but this is my first VR, so. This was like in, think we started in 2017, and if we premiered in 2019 in the summer in Hong Kong, so it was like two years, but on and off, it wasn’t like two years solid, it’s just when we had time, you know, might shoot, you know and

then, we can do post work on it, you can don't do anything for a few months and come back to it, ya

circle:

So, it didn't actually take two whole years?

Alexey:

No, no I think. I don't know how much it took, it's also you know paramount the editorial peak, so i was doing it in between other things, you know I might do commercial job, you know, VFX, I might go back to there when I've free time, so it's kinda like on and off, it was two years, but i wasn't two full years so, maybe you know, a few months I think if you actually count the days you know, that we working

circle:

Right, understand. And what makes you start doing KOWLOON FOREST? Or how do you choose the form from one to another? Like, why this is in VR but not in conventional film form?

Alexey:

Um..I think we wanted to, I wanted to make a film that could only exist in VR, not in conventional form, so, letting lot of it is about developing a language, which is unique to VR, this is kind of, this is example of ...when film was first, cinema was first invented, as a format, as a media...people start go to theatre and film theatrical play from the front, you know, that how

we watch the theatre, the theatre play, that's how people start making one of the early form of cinema was recording from a single view, and I think that it took us a long time to figure out all that medium from camera position, it's like different, you know, cuts and times and kind of things which are unique to film rather to theatre, and I think now with VR, we're kinda at that stage of filming the play right, we're still trying to figure out what can be new and only exist in VR. So, KOWLOON FOREST specially was...I was trying to do, is to have this feeling of proximity and closeness to real people, so that's why you're always in an intimate moment, both narratively intimate, these people are doing things where they are alone or normal til privacy, any moments they're not being worst, but also spatially intimate, you get very close in moment, taking off makeup you're right in front of her face, you know I mean, which me her in the mirror. So, we wanted to, cause if you do that imagine in that film, like ya find wow that'll be here a close-up, coming really close to the camera, you know taking a little concept that wherever. But it won't be have such a kind of feeling as a human, a XXX body, cause you know someone which have this idea of personal space, so someone gets really close to you, like, you kind of ooo (lean back), and the idea was to create a play with that feeling in VR, that's something you can "feel" rather than "see" as a 2D things. So, I think that was the main experience which can only exist in VR.

circle:

Right, right right, I definitely can feel the proximity and the intimacy in the film, and I think we can talk about it more when we come to on-location shooting later. So, let's...the next question

is the script, so you wrote the script right? How does the script look like? Is it in a textual form or is it graphical?

Alexey:

um...I don't have it here...but I can send it to you later, but i'll answer your question, but also ask me after interview i'll send it to you

circle:

Right, right, right, thank you

Alexey:

It's both. So, it was kind of a combined script, sort of pitch day, so we had, like for each, so there's 4 chapters, the intro of the roof and then the 4 character chapters right, the 4 character project. So, each of those moments we have three things. So first we have a script, like a text script, but it's mainly descript because that the film is not like a action piece, so basically it's character portrait, series of character portrait. So the film, sorry, the script is the description of the character in front of the space, the description of preps, that's even thoughts of what the character thinking, but that never set, it's not the voice over that we hear, that's a separate thing. There's also for each character, there's maybe some internal thoughts, and it's just for the actors to understand who the character is, kind of maybe feeling, so there's lot of kind of internal process in that script. So, it's about description a century, internal description, external description. Then, there's also, I think for most of them, plan, like a floor plan with top down

view, because each of the scene, it has, it follows a sort of cross logic, it's a front and the back which like a mirror. As for the first scene, there's a woman and the mirror, in the second scene is the mukbang like a livestream and the business man watching that, it's kind of mirror, like two sides of the "dinner", in the Mong Kok scene, the second, the two maids playing cards, to domestic helpers, and then it's the Chungking Mansion, it's the astrology guy and his screen recording, right, so, there's always the axis that exist the front and back, so, there's always a plan, kind of to explain what that is, and then, left and right is also another axis which should be interior and exterior, so, always to the left, you have a view of outside, outside the window, or the overpass with the maid; and then on the right, it's the other view, so it's kind of into, looking into the space, you know, into the room or into the hall way of Chungking Mansion. So that was the plan. And then thirdly, there was also just the reference, a set of reference, images might be the reference, so space reference for the character, you know, just visual references of image from, and everything from other movies, from Google, from you know wherever they may be. So, there's all three things, so descriptive text, script, floor plan and image references for each character session.

circle:

Okay, interesting. Floor plan is important because in one shot, like one...ya in one shot you have to clearly visualise the actor placement with other crew members right, like cinematographer Nathan. So, ya...but did you two...to draw the floor plan together or you have them in mind and then you deliver it to Nathan?

Alexey:

I actually drew it with my production designer. He was also part of like help the spaces. I showed it to Nathan but I don't think it's...it didn't matter too much...kind of...I guess he is...didn't necessarily change anything or the floor plan, was doing it's small just...he understands it's the scene and "okay here we put the light" or whatever, because the way we filmed it actually is filming quadrant, right, so we don't film like a 360 camera, we used separate cameras with fisheye lens for front, back, left, right, and then we stitched it together. For example, when we filmed with front, we can actually all stand at the back where we're not seen because filming at the front angle. The only time where...ah I can send you a link a bit later, send you a link of my website, in a blog session have behind the scene, you can see how we film in different things. But the only one where we running multiple cameras at the same time is the maid playing cards, because there the actions has to be synchronised, that's two cameras kinda boat together to front and back, we can still stand off to the side left and right. So, that one has a specific kind of reason why we film front and back, for example the scene where woman XXX makeup where the first scene, we just film the front, and we're not filming the back, because the back is done later digitally.

circle:

So, all the.....but how can you film the upper part and lower part? Cause it's like, it's actually not just 360, it's actually 720 degree right. How did you film the up and down?

Alexey:

We filmed that with...well that's depends on which scene. Mostly those kind of the parts out of view, the camera there rendered, so there's CG, like computer generated. So, the rendered environments. With the maid scene, it's different, because they are playing card to the ground, it's actually real, you see the cards kinda going down, but that one the roof is CG. So, a lot of the film is computer generated, so normally, there's three elements in each scene, so, live action filming on the set, studio set, that's normally the axis, everything the axis is touching, right, that could be on a small scale setting, the table, you have the table, the stuff behind them, right. Then, the views, kind of exterior views, use of the city views of location, they're filmed on location in Hong Kong, but then not film at the same time, that filmed separately. And then everything else is computer-generated fit-in environment, so, that's 3D XXX render. So, every scene has three of those. I can also send you the...did I send you the making-of video? Like a...

circle:

No...

Alexey:

Okay, I'm gonna send you that.

circle:

Thank you thank you!

Alexey:

Lemme just, i'll make a list of all the stuffs I need to send you.

circle:

Thank you thank you! It will be very helpful!

Alexey:

(talking to himself) I will send you the script, behind the scene for those and making-of video...

(talking to circle) The making-of video is a technical view of visual effect video where we see all of different elements can being assembled together. My professional background is visual effects compositing, so that's my main job. And that's how I won i think is advantages here because you can really cannot perfect each part. And also makes the shooting easier, you're not shooting the full thing in one go. For example, when we shooting the maids in the overpass, we're not actually in the overpass, the overpass is rendered. We just have the kind of set with the boxes and all the props like the bags of.. the food, whatever, in green screen behind them. And then that gets compositing to rendered overpass, and then the street view of the roads, road below is from Hong Kong, it's a real road.

circle:

Understand, understand. No wonder I feel the resolution seems so high, because I watched other live action VR films, I feel that mostly the character are further away from the camera, because of the stitches problem of the 360 camera. So, actually you are using 360 camera, but you're using four cine cameras.

Alexey:

Ya, we used the old black magic, it was 2.5K, it was on a little silver break, you know this one?

circle:

Okay, okay

Alexey:

That's also resolution question not only from the render, but it's because we have sort of 2.5K, but 2.5K each direction, so you, essentially 10K, right

circle:

(I see)

Alexey:

So you...the film we delivered in 8K right VR but like the raw footage you have around 10 thousand pixels all around because you have 2.5k each direction, that's why also high

circle:

Right right right, understand understand, interesting

So when you first gather the crew, how did different departments come together for this project?

Alexey:

What do you mean?

circle:

Like how do you get Nathan or the Production Designer, or the VFX? Did you do the VFX yourself or?

Alexey:

Ya, the VFX I did myself. And also, Paul the producer, he... we both work in VFX professionally, so me and him did that. Production Designer Vivian she is a friend of mine, she's a designer architect so she helped me do the stuff. Nathan ...we've been friends and I asked him to help me out on this, so...it's kinda a personal project, so it's kind of make a budget or anything, it's just like a my own personal directorial piece, I think we all doing in sort of in at our free time, just to do it, not a big commercial job compared to other things maybe you know. And it's kind of, pretty informal, we had, we shot all the things separately, so each shelter we filmed it separately, so might have one evening when we shoot like the first scene, the room makeup, right, and so we have like, whatever like 3-4 hours we shoot that, just one scene, we did multiple takes kind of testing different things to get, like, better performance, you know, all these kind of things. And then, when we post production on that, and then we might do the other scene, right. We also have another kind of day we shoot that, you know, for several hours. So, it was quite... informal thing, it wasn't like super...I mean it was super organised and put all

together but it wasn't like a high stress shoot, cause that was sort of, we took time to do it, you know, a personal project for all of us. I just kind of...

circle:

I saw that there are two additional cinematographers. Who are they?

Alexey:

Who is this? Jerry? Jerry helped film some stuff on location in Hong Kong when I wasn't there, some additional thing, because...actually the stuff most like only on location stuff in Hong Kong see the city filmed by me... in Hong Kong. But I think there was one scene maybe two can't remember, where I needed him to kind of film some additional elements, you know, to build up the scene, which I realised oh we need it later, it's kind of pickup, so, I just asked him, you know, so this gone to XXX Jerry. And then was Tim, he just helping film some stuff in the studio shoot when Nat was busy or ya, so he was helping Nat also on set.

circle:

Can I say that they are camera assistant? Their role actually ...

Alexey:

Ya, you can say like that...for Tim, yes. But for Jerry, he was just more ...cause he wasn't assisting, he was just shooting like a pickup, like extra content.

circle:

Ah I see.

Alexey:

It's different. So like I realise "Oh, I'm missing this thing, I'll like to have this view" like I send him to go, up like, above like mid-levels, you know XXX hiking path and shoot like a view of the city ...at like sun rise...I made him like...do that kind of stuff, so I've realised once we have already shot the main footage of that scene, I realised "oh we'll be good if we have that extra thing, like kind of insert as a view here" ...That's what I mean by additional cinematography

circle:

I see I see I see I see. And for your shoot, is there any gaffer or grips? Or camera assistant?

Alexey:

Um...well camera assistant was Tim on set, ya, yes, Nathan and Tim ya...Tim helping set up lights. But no official grip or anything like that, no

circle:

Cause you shoot green screen right? So actually I think you have a gaffer or...for the green screen shot?

Alexey:

Green screen was only for the maids, because behind them is CG. All the other scenes, there's no green screen because we built that partial set, or we shooting in an apartment. So, where were the actors are all real. So, it's only green screen just for the domestic helper scene.

circle:

Okay okay understand

Alexey:

And so I mean the green screen stuff was mainly handled by me and with Nat, cause I know VFX, so I just checked, like you know, how it looks, you know, so it's me and him set that up, it wasn't like a particular...it wasn't like a big, you know, thing, we just "okay, we put it up here, we put it up here" you know, just make sure that is lit evenly. But...because I was gonna be the one doing the effects, I just make sure that it was usable, we filmed in a usable way, you know. So, Nat and I was the VFX supervisor...which is minor job, but i'm not doing at my own editorial world, so, I just checked that. So, I was checking the green screen.

circle:

Okay, so, speaking of the....okay, so actually you're not using a 360 camera, and, but um...I don't that you're doing it in a more "conventional" way, but can you tell some differences between your shooting of KOWLOON FOREST and ...between the conventional filmmaking and KOWLOON FOREST?

Alexey:

Trying to think of a good example for you...I think there are a lot of, there're definitely a lot of things which we did differently, you know, compared to other non VR films that have grown over time. It's a good example perhaps, in the first scene where we have the makeup scene, even though we are not shooting, perhaps, 360, but we're still shooting a very wide frame, and also the camera is very intimate, it's very close to the actress literally, and she's also doing something very personal, she's taking off her makeup, you know, from her, something which we normally do in private along with that activity. So, when we first filmed that, we actually were filming it, it's kind of like no way here when we start, we kinda all behind the camera, you know like, makeup artist's there, get closer, under, whatever. And then we realised that the performance, it was kind of not natural, so actually what I realised on the set "okay, how about we do this?" And so we rolled the camera, that Nat show the camera, ticket's recording, and then we all left the room, so she was actually alone in that space while she did the removal of makeup that action, because it is something very intimate, the camera is kind of very close position, so, you know for it to feel natural, we tried to make it as realistic as possible in the way, so, we left the room and then she called us when she was done, and then we cut the camera, going back to it. So, that was a moment like this when we kind of...we didn't necessarily plan for it, I didn't tell people that's how we shoot it, when we are on set, you know, we kind of, we'll start, we're learning how to direct in VR again, as you know, they're gonna re-plan for that and then...but I think there's kind of small things like this, it's cool, maybe not so small, but that we change how we shot the film. Is that kind of answer your question?

circle:

Ya ya ya, because, how the workflow works the same, because of the content actually you take something different, slightly different from conventional filmmaking. Let's talk about it on-location more, a bit later, because I have quite a few questions relating to the on-location shooting. Ya, still speaking of the pre-production, I know what you...there's not a lot of scene in the film, as a short film, but you still need to do location scouting or recce right? Were there any differences between VR film location scouting and conventional film scouting?

Alexey:

Yes, yes in the sense that, I think when I was there on location, cause I also on film on location, so kind of, there was not like I might go location several times, but essentially the scout and the location were together you know. And I think one thing that was difference was when I was choosing kind of place in the recce I was seeing like location would it be, I'm not considering just one single view, I'm considering the whole kind of 360, even I'm not have using the whole 360 in the thing, cause maybe the rest will be CG or the rest will film in studio, but i'm trying to see...it's hard to put on a word but...I'm thinking of the space kind of in whole entirely, and...so, I'm no longer looking for a single frame, which is already kind of different in the way of thinking about how our location may look on camera, in camera, ya

circle:

So the actual space is actually can give you more visual idea of the final look of the film

Alexey:

Yes, but it's also more problematic or more difficult because when choosing location I have to consider "okay might look good in this angle but actually if I turn, gonna 90 degree's right so I look back, so i'm kind of trying to find locations which are working in multiple directions for VR, not just in one location, sorry, not just one specific kind of frame. We were kind of control the idea the audience to look, so i'm trying to use some kind of...lot more perhaps tougher selection of location, it has to work in all angles

circle:

In all angles

Alexey:

Ya

circle:

Even you're not using all angles

Alexey:

ya..I mean well, I might be, only location, might be using from one half, kind of using 180 out of 360, but still have to make sure it looks really 180 rather than a tiny square.

circle:

Right, right, understand understand. Yes, I know that you have a graphical script, a floor plan, some reference images, do you have a shot list or storyboard?

Alexey:

No, I don't think we had that, because when we shot it, for each shot, we just did one scene at a time, so we just did the makeup scene, we just did the maids, you know, we just did the astrology XXX. So, um, each kind of scene is shot separately, so we just had one scene that we shot in today, with one shot essentially, so, we didn't have a shot list, we just had a, you know, a plan for we doing

Circle:

Understand understand. Moving on to on-location shooting, yes, we have covered how did you decide to put the camera, because it's based on the story, it's a two-way looking. How about the sound? How did you record sound? Using boom mic or rely on wireless lav mic?

Alexey:

Um...good question. I think the scenes where we had dialogue, for example the filipino helpers that chatting to each other, there's like a sound recorder hidden under the sensor, right like a Zoom you know, H5N Zoom, which have a two-souce directional mics there; while we do the...trying to remember, so long ago...when we had the mukbang korean livestreamer, she's wearing a mic that pinned to her clothes; um....the same I think for the astrologer, there's a mic somewhere, I can't remember how we did that, but it's pretty conventional I think the sound

recording then, because then what I did later in post production, but I have all these difference sounds, you know that, because I was also filming on location, might have the sound from the camera, if I want to have like the location, cine close sound specific like... what's the specific sound... again, the crossroad in Hong Kong, (sound effect), like that sound is very specific, so like, I might record to have that in the footage on location of that sound, you know, and like strike back, or...pretty like that. If it is general stuff, that I might also just use sounds like online, i'm gonna free download at the sound library, there have you know xxx over years. And then I have all these different sounds, that's the sound from character speaking or sound from location, sound that I get from the online library. And then what I did was, I put them...cause the sound is ambisonic, you know like a four channel express audio, so i put those sound sources in different positions regid to your head. Right? So one sound comes from like here (hand gesture), one sound comes from behind you, one sound comes from above, you know, you have the aeroplane that I drewed cause aeroplane sound like that, you know from a mind, keyframe it from there to there (hand gesture), you know, so all the sounds would then spatialised. Cause I recorded it normally I think, like there's stereo but for that procs I has been mono, single channel, and then that single channel audio is in place spatially. That was in Premiere, had an plug-in for that, I forgot I can tag you while you look into, but, that was done in Premiere I believe, I'm not 100% sure. But, that's process where we made the audio spatial circle:

Is the panning...the sound?

Alexey:

It's not just panning...it's light panning, cause panning is kind of like stereo, left and right. But it's also done ambisonic, can put it in all sides around your head, like be above you, can be in front of you, can be behind you, can be to the right, can be to below you. So, I don't know exactly how it tricks the human brain, because it's only 4 channels of audio and ambisonic right this, ah, 4 tracks, if stereo it's 2, but that's single 4, but using 4 I can create all positions, like that's below you or, you know, to the right, how close or how far. So, that I don't think is, I was in that myself...and It wasn't maybe too difficult, but like it took me some time to figure it out, but I would...it makes sense, but It was really, I found it really important to be precise. I think our brain, if the sound is wrong, then we understand that, like so for example, if the sound is gonna coming from like behind a wall in that position, actually sound is not behind a wall in that position, you know, rather than...um, ya

circle:

Understand

Alexey:

Xxx If you off them, you kind of I think subconsciously we feel, we might not know why it's wrong, but then we feel that, you know. So, I think this sounds really, when we manage to do it right, it really improves the experience and xxx emerge the whole experience of watching a film

circle:

I absolutely agree. Although I'm not a sound person, i'm more visual ...

Alexey:

I'm not either a sound person

circle:

And I don't do post at all actually, but ya, a bit editing la. But ya I mean what you mean, that's spatial sound. But the VR is just two speakers? Is it left and right? I think it's stereo? But how did it happen? I still...I remember clearly that I knew that the aeroplanes, it's like, the sound is coming from top

Alexey:

ya

circle:

Ya I also don't know how it works in a ...

Alexey:

The VR is ...sorry the headset is two speakers, ya, but then, that, the sound which being played changes, panning where your head was, right? So, if you look up then you hear it looking up, if you look down you hear it looking down. So, within that, within the player, within the VR player in a headset, it's takes that spatial audio which is 4-channel and it makes it 2-channel,

depending where you looking, right? So if you play the same track, looking always to your left, it will sound different, and if you watch the whole film looking to the right, because of your head position. So, the way it actually plays the sound is different. So, the headset does that for you basically. As long as you give it the, you basically if it the whole, the full spatial audio, and then it will figure out what you hear based on your kind of head position

circle:

Okay okay, but what you did in post for the film that screen on VR headset, you don't have to consider the 360 panning, right?

Alexey:

I don't have to consider, I just have to design the full space, like a full 360 space of sound, but I don't have to consider where the audience looking at, that's handled in headset

circle:

Right right right, because

Alexey:

I just make the whole world of sounds and then depending on where you look, it will play different things, you know. So, that might be a sound source coming there, and if i look away, then I won't hear that, or I hear very quietly

circle:

Right right right, interesting. Actually it's the same concept of vision, the audio and the visual is the same, you prepare the whole 360

Alexey:

Ya, exactly

circle:

Right, right, right. Okay, and. So, since you're not using the 360 camera, so you actually monitor the image and sound like normally on a video village, just behind the camera, right?

Alexey:

Ya ya ya

circle:

Okay okay. How about the actors? Do they have any VR of filmmaking experience? Or since it's just normal conventional ...

Alexey:

I think it was the first VR for everyone, including myself, like first VR, as far as I know, I don't think anyone, any of us has experience making a VR before.

circle:

How did you direct actors? Any special thing for them to note take note of?

Alexey:

I think there's two things. The first thing was kind of what I mentioned with the script. The script had a sort of a description that the character will read, so actually the script will, I mean, everyone read it on set but it was mainly intended for the actors, so maybe like some description of the character, what they're thinking, perhaps, so I'll send you the script to become more clear, but the script is sort of an internal monologue. That was the first part of the, kind of, direction. The second part I think was also casting. You know how, when we started making film, someone told me like "casting is 90% of directing". So, um, and I mean that, because I think that, especially in VR where you can no longer control where the audiences are gonna look, cause they can look where we don't want, you know, and, so it becomes less about kinda getting a specific performance from actors, becomes more about the overall world and experience that you're trying to construct a moment including the space, including the set, so I think that there's a lot of, I think there's maybe one reason why VR landed self grow to documentary filmmaking because you're sort of, you're not considering sort of like one single that view, instead that overall portrayal, you know, the real character, and the real world, and the real kind of, so you need to be more holistic I think as an approach. So, for that reason, I thought the casting is really important. So for example, a simple example, I get the maids as example, XXX both from Philippine but one of the actresses, she is daughter, she's born in Hong Kong, she's a daughter of a domestic helper in Hong Kong. So it helps also kind of her and her

mum just feel like develop that scene, you know, that's a bit kind of more authentic, more realistic. Things become bigger than this, that works in my head. Alright, or Ming who plays the business man watching the live stream, yes he works as a business man in US and Asia for many years before he was an actor, so, again that's kind of personal undig work around. The guy plays the astrologer, he actually is a real spiritual teacher from South Indian as well as being an actor, so as for example, his scene, I mean, I was in told him the overall idea "okay this is a kind of a exist in Chungking Mansion, and I explained what Chungking Mansion is, you know, within a continent in Hong Kong. And then I say "Hey this is a internet cafe by day, you get transformed into a astrology centre at night" But then perhaps all the costume outfit he's wearing is his own outfit, all the, the action and the whole process that he's going through the action is directed and driven by him. So, in that sense, it's really what I mean sort of the, it's not just about getting a specific like a "you do this", but more like making sure I get the right person, who can then develop this more holistic world for the acts, in a way that's like the filipino domestic helper or the Indian astrologer or whatever that may be, it's not just about me saying I get you do this, they can actually bring something which is from their own experience, from their own world. I think, I mean that's a good, I think that's a good approach to any film. But especially in VR, where you're kind of considering the overall world rather than trying to make it, just trying like to fake above of images in one specific rectangle...that becomes so much more authentic. So I think authenticity really helps in that, that way.

circle:

Right right right, that's very interesting because they are actually not very "actor", they are real person of the character. And ah ya, um, so I guess the directing mostly the difference is the casting

Alexey:

ya

circle:

Right right right

Alexey:

I am also considering, I guess, the overall portrayal of the kind of the space and the extension of the character, this kind of overall thing. That was also kind of part of directing of making sure...so, there's another example, say the first scene, Shelly who plays the woman taking off makeup. For example, in her room, if you look around, some of the props that you seen in her room perhaps the photos that you see on the wall, they're actually her real childhood's photo from Hong Kong. So, if you kind of looking around, you will say "ah that's like a, you know, young version of the same person" So, that's kind of her real, you know we borrow them that's we get him bike after we finish shooting. But that's sort of, there's a real depths that I made sure to include, that kind of bridges the gap between the environment and the actor, you know, and a clue you'll see that, the outfit, the set decoration or props, you know, and the actor. For new all kind of, they become one thing, almost, isn't got a one holistic view

circle:

Understand. In that case that you use their own outfit and own props, what's the job of the production designer?

Alexey:

To make it look good

circle:

To make it look good, on set?

Alexey:

I mean, it's only some of the props that we still use, some like the photos that from her is like 80% the other props of props are re-edit, you know. So, XXX it's just smaller thing, or the outfit is true for the Indian astrology scene, that's his outfit. But for the other scenes, we decorate the outfit you know. So, there's still the street element as well, I just mean that, whatever possible we tried kind of work with the actors and bring something from their own life and their own experience to the role if possible

circle:

Okay, understand. Yes, I know that, once again I know that you're not using a 360 camera, but how do you feel about the spatial usage in your VR film set? Like the distance that you have on

set, the distance that between you and other crew members. Can you tell any difference in your setting? Spatial, it's about the ...

Alexey:

Ya ya. We had to make sure we'll always aware of where the frame is. Actually I think even if, I mean, I don't think it's matters whether it is VR or whether the film is 360 or you kind of filming individual quadrant and stitching later, cause you still have to be aware of where the line is. So, for example, when we're doing shooting the makeup scene, she's kind of sitting at a dressing table, and that table is real up to a certain point, where is visible, but then the rest of table is CG, like a rendered, underneath the camera, we don't film that you know. So, we have, the table is half real and half digital. And so long we've put kind of tape on set of where the field of view ends to make sure all the actors like they don't kind of go beyond this line of tape, cause that will gonna be like in the area where's gonna be CG later. So, we'll kind of, we'll always be aware, and it's similar example on other sets, we'll always be aware where the field of view is. Also for us, as crew where we can or cannot stand, you know. That was well but it also for the CG, for the special effect integration too. So, we always kind of aware of this thing because VR will be stitched, so here is the stitch line, make sure you don't cross that

circle:

Right right right, ya ya ya, because if you cross that, meaning they have to CG the hand or ...

Alexey:

Ya we have to, or you know if there was action where we needed to be across stitch line like the two filipino helpers playing cards, I mean have to make sure we have two cameras and to film them at the same time, so if we need that for story, we can do that, you know. But we only filming one quadrant at a time, then we will make sure that we set this limit up.

circle:

Right right right that makes so much sense. I think so far we have covered a lot of interesting points, to slightly conclude the so called “interview”, can you describe the biggest difference between your role as a VR film director and a conventional film director?

Alexey:

I think it was that that thing i’ve mentioned where it’s about trying to consider the overall kind of character and extension of the space, and maybe the background, the character, trying to make the portrayal of your character on, in the VR film, the as kind of holistic and kind of all rounded as possible, you know. So, trying to portrait, I guess it’s easier to put it in, I’m not just thinking of trying to portrait one kind of moment, I’m trying to portrait an overall world that I create, so the world of the character you know, in a way how emotionally physically whatever maybe. But I felt that really kind of strongering? Compared to traditional film, where, you know, I know you’ve been on set you know how. Sometimes, the shots are really artificially constructed, “oh doesn’t matter” as long as it looks good through the frame, that’s it you know. But here couldn’t re-do that, make sure that, that’s why from the casting you know, i tried to make sure everything is kind of as much depth as possible, to then because you can’t really fake

it as much as you can in regular film. Alright, so, so it becomes less about the single frame, more about the world you construct. That's the biggest difference I think

circle:

Right, understand. And, um...sorry I think I have missed one question about the camera. Why is it in the first place you didn't use the 360 camera? Is it because of the VFX? You want a high resolution?

Alexey:

No, it's because of image quality. Cause I wanted to shoot raw video, shoot everything raw.

That's not...like all those VR...I get my experience like from working on gain visual effects, most of the egg VR, kinda like say big commercial that shoot VR, they gonna...that's a famous, what's that, BMW commercial in VR with GG habe, maybe it's misadi I don't know, no no it's not VFX.

They don't use 360 camera, they just use 6 REDs, you know, built it together into rig, because wanna have the sensor of that camera. That's no 360 camera sure have a good sensor as like a RED or ARRI or whatever even BlackMagic. So, it was mainly for image quality that we wanted to make sure that we will use a camera with like a "cinema" whatever level sensor. Cause I think lower the 360 cameras are not as good, the ones out of one is kind of consumer 360 camera.

circle:

Right right understand understand. Okay. Ya, so I think i've obtained a lot of interesting and helpful information for my study, although I really want to talk more about your film and your

other film as well. We can always text in Whatsapp when you're free or when you go to Hong Kong

Alexey:

Sure

5. Director Josema Roig

CVR project: *The Argos File*

360-degree, non-interactive, trailer, live-action

Duration: 3 minutes

Release Year: 2017

The Argos File (2017) is a 360-degree CVR trailer for an interactive VR video game directed by Josema Roig, which integrates cinema-quality visual effects and 360° stereoscopic live-action footage. *The Argos File* (2017) won the prestigious Proto Award for Best Live Action Experience and was selected in multiple film festivals. The trailer is extracted from the first chapter of the VR video game, which was written by Joshua Rubin, a veteran in screenwriting before becoming a video game writer. *The Argos File* (2017) was filmed by a 360 camera. According to Director Josema Roig, it was the first CVR that contained camera movements done by a 360 camera.

(circle - Interviewer; Josema - Director Josema Roig)

circle:

In my research, I am comparing the two alike but different art forms which are "conventional film" and "Cinematic Virtual Reality". Some categorise them as the 2D and the 3D respectively. But I think "conventional film" and "Cinematic VR" are more appropriate in academic research. So that, I am using these two words instead of "VR film", but since "VR film" is more common and widely used, we can still say "VR film" during our interview. Do you usually called it "VR film"? Or do you use another term?

Josema:

VR film is okay. The thing is sometimes when I explain certain things, when I explain virtual reality to people, I sometimes I use another term, but it's demirious a little bit, VR film, "stereoscopic cinema", "stereoscopic" or like "360 cinema". Just because when you are doing virtual reality, the six degrees of movement change everything, so, but it's not a film because it's interactive, and as we progress, we're gonna going to into a volumetric capture, we're gonna have like ways of moorings side of film, so, I think I gonna change as we go, so I think that when we're talking about 360 cinema, it's okay to say 360 cinema or just "stereoscopic cinema", "stereoscopic 360 cinema". But VR film works, for, like, to make it short.

circle:

Okay. sure sure. So let's begin with your background. How long have you been making VR film?

Josema:

So, I started in 2015. It was like, honestly, I didn't think so much of VR, I thought it was really cool, I thought it's interesting way of doing things. But I didn't think too much of it, until Facebook bought Oculus for 2 billion dollars. When they did that I thought like "Facebook is buying Oculus that means everybody is gonna have a headset in 5 years, which I was wrong" But it makes sense to think that, that is gonna be a big push for it. And then I just jump into it. And I started making connection, I started like finding the right people to make something together, as I was learning because my film was like traditional film. It was a whole process like

finding the right partners and learning what people were doing, and what people were doing wrong specially, right, what people were afraid of doing, right? So, a lot of my first piece was about like that, I got what, how can we move with the camera, how can we use the limitations of virtual reality in advantage.

circle:

Right, true true true. So, The Argos File is not your first VR film, right?

Josema:

Ah...technically yes, it is.

circle:

So you wrote, um...so you planned this story, you planned this film originally for VR film? Or it's originally for conventional film?

Josema:

The Argos File, the film that you saw, that's actually a trailer for what the real project is gonna be. It was always gonna be an actual virtual reality video game, that would mix interactive elements like police investigation elements, using VR videos as for the investigation, so the whole idea is that, you will get into a...you'll become a detective in 2039 something. As a detective, you're in charge of finding the killer in the homicide case, and what you do is like, you have to get into the memories of the disease of the dead people, trying to find in those

memories, who killed you and why, right, so that was the game, that was the b, that was the story, that was Joshua Rubin who you would gonna meet as well, like he wrote the amazing art and story, we had characters and plot. And while we're doing, trying to convey in a little short film, what that was gonna be. So the idea was like, that you'll be in virtual reality with a menu, like a main "frame", like a matrix, and you'll go into memories, and that you discover things inside the memories, you'll uncover new memories, and you go from one victim to the next, to the memories, and as you progress, you'll find out what the whole story is. And we got to do it, because we had some money on the table, but it was not enough when that up like backing up...and ya, so that you saw was normally tech need for virtual reality, it's just the trailer of what it would have been.

circle:

So the virtual reality game will be a sequence game, a continuous game or just be a single like one or two hours game?

Josema:

Um...the idea would be to have something that could be maybe like 45 min or maybe 2 hours, depending how deep you wanna go inside the memories. Because what happens with, and that's one of those limitations that we want it to use as an advantage. So the limitation of VR film, right, like the limitation of 360 cinema, is that, you're gonna change what happens, right? But In virtual reality, you would have agency, right? like that's what happens in interactive virtual reality what you can change, you can move around, you can touch object, you can affect

the environment. So, you're gonna do that with video. But we want to create a system, where you could actually do that with a certain level of freedom, like look around and find clues, those clues would take you to a different video. So, you're not interacting with the video, but you're creating an experience that is narrative through the video, and connecting ideas and concepts, and using hotspot, using ways of interacting with the video. And I think that was a smart way to do something that I know hard to do which is VR film, which is cinema and mix it with video games, which is what I do now mostly, by the way. I thought it was interesting, it was a clever way to use VR in a way that makes sense for headsets like because back in the day, like now would you have VR Oculus Quest, right? You can move around, you don't have cables xx thing, But we want to make something that could work with a headset with your phone, right? Like a simpler headset that Samsung was building or ...ya stuff like that.

circle:

Right right, understand. I think that's a xx will be focusing on how you create, how you produce the trailer, although the gaming part is really interesting. But then, ya, so um, for the script, I think I continue the script conversation with Joshua. But um, can you talk a bit about your relationship with Joshua? Like, is it in a conventional relationship that he writes, and then you visualise the script into a video? What's the relationship between you and him?

Josema:

Ya, I mean, Josh....So the things like, when I started...I started putting this together, and I was doing it with my friend, Michael Steiner, who's the producer that I met in school, the midget

institute. And we were looking for a way to give shape to this crazy idea that i had in my head, right. And what we were trying to do was “learn”. We want to learn what this whole thing was about, right, like VR, interactivity, how to make something with film that felt like interactive and relevant, and I had a few ideas, I had a few ideas that ended up being like the foundation of what the big concept for The Argos Games that gonna be. And then, at that time, I was working in video games already, and I had been working in coordination of script, performance sculpture, voiceover, and all the things for big games like Fallout4, or XXXtube. And through my boss, I was at GDC and had to go like GDC 2015. And the GDC I was part of the narrative section, you know I was coordinating some stuffs with my boss, and everything. And Josh was there, because at that time Josh was waiting for Telltale Games. And Telltale Games was exactly what I was thinking, like, it’s a story that can branch out different ways, it’s very narrative, story and the character is the most important thing, it’s not about like making the game super cool of killing people, it was about telling story with interactive branches, right? And, so we met, and it was random, it was we just on the street, honestly, outside the thing, we started talking in...and I said like “well I had this VR thing that I’m like, you know, I really wanna make.” He was like “Oh, pitch to me!” And I was like “Well, it’s this this this...” And he was like “Oh, that’s really interesting, are you looking for a writer?” And, like, he gave me a card, and I didn’t know who he was. And then I looked him up, and I was like “Oh ya, that’s great, because like we get along, he was super cool, super nice, I mean you will meet him, he’s very very nice. And then I looked him up, was like “Joshua Rubin, Assassin's Creed II, Joshua Rubin, Telltale Games, Walking Dead, Game of Throne...” I was like “What??” Um...so, immediately I was like “Hey man I just looked up your stuffs, this is awesome, let’s talk.” And then immediately he came with a lot of ideas, he

was super excited, and i'll let him talk to you about it. But he was very gracious, he was very gracious with time, and he was also...he starting more about it but like at some point this starting becoming like more real, and he got very involved. So, you know, I gotta, I got up to send rough views, regulative, you know, i wish fan like weekend with his family, and writing, and all stuffs and... he was great, he was great because he thought things, he thinks in a way that is very similar to mine. And also like, very interactive, like, very like "this could be this" and that could give us ways to develop this, or that. And I think that way as well, but the fact that he's done it, and he knows how to like do this (open up hand gesture) and then go back (close down hand gesture) and then go, you know, open up again. That's really important for branching narrative, and that what was like really really cool about developing the whole story, and we never made it, you know, but he wrote a lot, he wrote a lot for that VR thing. We talked to a couple Hollywood actors, it almost happened, but at least we got the trailer, you know.

circle:

Right, yes. That's was cool. The trailer is very cinematic. So, do you mean that you have developed...you and Joshua have developed the whole story before you filmed the trailer?

Josema:

Ya.

circle:

Okay, cool. So you know exactly which part to film when you developed story?

Josema:

More or less. Ya. I mean the original trailer, my first cut was like seven minutes long, and it was closer to what the game is gonna be, right. But it's slow, right? It was...because it costs so much money just to make those 3 minutes, that any extra minute will be more money and less quality, right? Because it'll be harder to stabilise everything, it'll be harder to add VFX, so we had to add the UI elements. So, when they're up, they're having like, we shot around like 8, 9 minutes of footage, when you put it all together, and it felt really good, in my opinion. But it's really really expensive to make the whole thing, so we gotta like getting it much shorter to make it "click" and to make it like very exciting, with cool music, like lots of action. But, ya, it was basically the first...it was like a short version...not a short version but a limited version of the first episode of Argos. Because it's like, it gotta be like a series of episodes, which every episode it's a dead person, and you have to go into the memory of the dead person, and find the memory until you piece the whole thing together, and then you can unlock the second episode. So, this was very very close to our version of the first episode.

circle:

Right right, understand. So you mentioned that it's very expensive. It's expensive because of the shooting...of the production...production cost or because of the post production cost? Like the stitching editing?

Josema:

Ya, so, it was a little bit everything, because we were really really lucky, because the same way i met, I mean Josh, I randomly met Alex Henning, and...

circle:

The producer?

Josema:

Well, producer, and also the head of Magnopus, and he...I mean, Magnopus is a amazing amazing company, they create some of the best digital experience ever. They're really really cool, really really knowledgeable. And they were excited about the project, they thought it was a cool idea, that was smart in a way we used VR to tell the story, into use activity, and all the things I told you. So, when we talked to Alex, he want to help, and we were like looking for ways to help, to do it together, to collaborate. And then one day, at that time, the Nokia was coming out with the Ozo camera. And the Ozo camera was very interesting, because of the way it does a few things, specially the fact that that was the first the camera with all the cameras in a sphere, which now is pretty common, but at that time was pretty revolutionary, and it did up a couple of things really well. So we tried to have the camera and figure it out. And then Nokia offered a good amount of money, I don't think I can tell you how much money, but ah...

circle:

That's okay!

Josema:

A good amount of money to produce something from Magnopus. And we're just, they were really really talking, and they called us, Alex, like, emailed us "hey guys, it's like, we have this amount of money from Nokia, and we believe that it will be a really good way to do something, so maybe not the first episode, but what about a trailer? Something that we can move around, and you know, and push around." And, ya, and we did. That's the way it all started, so suddenly we had like, we had X amount of dollars to produce it, right. So we knew that, if we want to showcase what VR cinema could be, we had to go all out on cinema elements. Right? Because the biggest elements for the shoot were it has to be head-mounted, it has to feel that you are like in a POV camera, right? So, that's expensive in itself, because we had to build out a contraption system, you know, to make it look like you're at...you look down you have a body, so that's really really important to us. It had to happen in a way that was cinematic, so we need cool location, and set dressing and lights and people, you know. We had to feel like a movie, right? It had to feel like you were a part of a movie. And that's expensive. So, we're looking for locations, and then randomly because we're looking for a few things, but then, we were think about like it was always gotta be day for...I mean, it's gonna be a night shoot, or dark shoot. And because of VR, it's really bad in low light, we had to really work on, okay, if it's a northern space, it's gonna look bad, because the sky's gonna be just gone, it's gonna be dark, right? And we need to light up a lot of the space, but if it's a closed space, then we can light the space in a better way, and make it "dark. But we start feeling that it just like gone, the information is gone, so that was really important, so after looking for a lot of space that were really really outside outdoor, like a beautiful A and beautiful long beach, a few more place like we're looking for

interiors and then we got to the mall, to moral reaction shock. And the mall was really really cool because one of the of the Ozo is that it's one of the first cameras, out of the gate had stereoscopic, like have the stereo 3D paring. And because of the height, because you could start in a high storey, look down, and then go down through the stairs with this slider down the escalator, and then be like around people and have people coming in and out, and filling the 3D. Then we were like that, that kind of visual been really really good, so we started like envision in that, we do the test, we took the camera there, and I did a test, I like, because we're like testing with the camera always on the stick. And then we done we tw on stick, and then we're be like "Oh, it looks good, we could have some lighting there, and roll up." And then Alex Henning was like "Hey Josema, is there any of the des you want to do?" And I'm like "Yes, I wan to move it. I'm gonna walk with it." And he's like "Okay." So we had a long cable, a very long cable so you can view it, and we did just a little bit like, maybe like 20 metres, not too long, but at that time, like nobody was moving the camera in VR, nobody, nobody. So, I did that. Because people would do it with robot stuffs, but it was not the same, so I just grabbed it, and I went there, and Alex had the Oculus goggle on, so he was watching VR and I was moving the camera. And I did it, we recorded it, and then I was like "so, how was that?" And he came out with the goggle was like "that was hot shit!" And I was like "Okay, I think we got something." right? Because when I was born in...um, from a technical standpoint was like, being able to like starting the room that was dark, get through a door, like have in all this space, look down, have the feeling of like, depth, and just a technical standpoint, that was what's gonna make the piece work, right? Like a lot of work in my mind was about the sensation that affect the body of being in VR. And then it's not like the story was not important, the story was very important, but the story is a vehicle, we're

like, we had to use that what makes VR unique, it is, it affects your limerick system, you know, it affects your routine brain, it doesn't affect just like your context, like it does things to your chest, to your body, to your belly, it makes you feel like dizzy or impacted, you know. So, that was really important, so, we had to be like, use heights, we had to like be in a crowd, we had to be punched, we had to fall, you know, those VR things were very important for the trailer to work.

circle:

Right. That's um....actually you have covered a lot a lot of very interesting point, like um, when you're doing location scouting, you have to be aware of the lights. And also, other than that, any...can you spot any difference between location scouting for VR film and location scouting for conventional films?

Josema:

I mean...It's pretty obvious, like for VR, everything needs to work, right? Like you cannot have one corner, right? You can play with some ideas, because you can get creative, you can always get creative, and you can cover one corner of the 360 or whatever, but everything has to work, right? Like for example, when we were doing Argos, what we had was like...we had this black tent behind the actor of the top, and what we did is like between the actor and the tent, because we were covering like so much stuff, like there was like everything was set, right? Everything was set dressing, so we have like a few tents and in front of the tent, we put a light, right, so with there's a light from a black tent, we don't see the tent, because the iris is closed

for the light, right? So, everything was gonna be there, for example, I'm an extra, like you can see me in the trailer, because to direct, the only way I could direct the scene was being in the scene. Because...we could see through the device, but it was...it didn't really work because the actual...to be able to do what we were doing, we had the radio receiver, that could see what was going through the camera, for like half of the shot; the other half of the shot, we had to like, we had the recorder in the chest of the actor, and they would have to take it out and check the take every time.

circle:

Would like render it every time, every take?

Josema:

Ya. So, we will have to, because everything was 360, so we couldn't have a cable, because painting out the cable coming out the actor will work. It was a massive massive work of painting out the cable. And that was gonna be like weeks of work in post-production. So everything had to be like real, like as real as possible. So when you location scouting, I mean it's like any other shoot, you need to find a place to hide, right? But if you are moving the camera, like you have to think that it needs to be video received and maybe now is better, but it's so much information in 8 cameras, or in 5 cameras, if that count down, whatever, it's so much information that the best way to get the best quality is to record internally and then we watch it. Because if you have like, for example, you're doing something like Argos, we used a POV, you're gonna have like 30 metres of cable, and the actor's trying to act, while being careful with

the cable because he could fall, trip, everything could happen right? So, that was really really tricky. And I, to this day, I don't think there are many films that do what we did, at the level that we did it, just because it's very expensive, you need a really good crew, and you need to like figure out system to mono this shoot, because, if you don't move the camera too much, as long as if you're in a room, you know, everybody can be outside the room, but you wanna try and use this space the way we wanted to use it, and I think that's a probably be our right like really, really do something that is like "Oh my god I'm here" right? "I'm transported to this world, to the scene" These all of the thoughts that goes into it, and for some what I did this day, which is massive, right? We had places to hide, you know, and it allows us to have a 360 environment, but the bigger environment the more expensive the shoot is to be, right? So, you need to balance how much you move the camera, how much you wanna dress the environment or how set dressing...ya it's...the bigger you wanna go, the more expensive it's gonna be. It's not like film, it's not like traditional film you can go to the beach, and the beach is cheap, right? You just go to the beach, and pick the right hour. But in VR, it's not, because if you want to go to the beach, it's gonna be, it's gonna look really bad, because hard to do, or you gonna have to spend a lot of money in hiding things and, you know, stuffs like that.

circle:

Right, right, right. So, do you mean that you shot in daytime and you light the closed mall to dark?

Josema:

Um? what?

circle:

Do you mean you shot it in daytime, in the mall, closed mall, and you light it at night time?

Josema:

Ya, the mall, one of the things the mall has which was really useful, is that the mall has this um...(hand gesture) I don't know what the word is in English, but has this windows on the ceiling, right, and it will like shield light on it. So, we work, so the DP went to light the ceiling and then we covered like half of it, right, so we like, we made it look like it was "night", but it was enough light, so the camera will record, will register (correct) something, it will be "darkness", right? So, we had a base, just like in traditional filmmaking, we had a base for the lighting, that was like "okay", so we could like turn it down down down in post, and make it look like it's night. So it was a lot of bounce between actual cinema lights, that were overspointing at the "camera", so when a cinema light is pointing at the camera, or lighting like a big chunk, and then pointing at the camera, so sometimes will have two lights, right, one pointing the camera, and one behind pointing out at the background (hand gesture) , so that way you don't see the light. So that was a way to like hide it, right? We're like one, this point lights to the camera, and it will just looks like sci-fi, right? It just looks like the neon stuffs happening. (hand gesture) We had people moving the lights, so lights will be moving, and feeling like more sci-fi. And then on top of that, we had all the neon, all the LED bars, LED things, that make it feel more...

circle:

sci-fi

Josema:

...more sci-fi, more blade runner, more cyber punk.

circle:

So, do you have a usual, regular lighting team? Grip team? That's the conventional film, we have a gaffer, grips.

Josema:

Ya, it was pretty conventional, like the crew was like pretty standard. There was nothing too weird, out of the crew. There was maybe like 30 people, 35 people, you know, so it was big for VR shoot, but it was not crazy for a film shoot, you know.

circle:

Understand, understand. Because I couldn't see the credit list in the trailer, because it's normal there's no credit list. But I just wonder...because my research is focusing on the division of labour, as in like how they define the roles and responsibility to different creative members on set. So that, ya, but I have interviewed a few filmmakers, VR filmmakers, they all told me that actually there's not much difference of the location shooting, right?

Josema:

Ya. You mean traditional film?

circle:

Ya, so they did both, and they said, other than the camera, that's not much difference on the division of labour, like how to define jobs

Josema:

Ya. I mean, I don't think that's completely true, I mean, I think the crew is pretty much the same, it doesn't change. But the way of thing is very different, right? Because you can't hide, right? For like, in cinematography, you cannot hide right? In set dressing, a lot of set dressing hiding things, right? Because, you're gonna have like cables around, you're gonna have like certain things that you usually have, things like "oh doesn't matter because you wouldn't see that cable, that computer, that whatever", right? So, the mentality has to change to like 360, that's very obvious, but that's the case. And in this particular case in Argos because I had someone like Alex Henning, like thinking and there was like a film mind like visual effect as well, then makes it...like you need someone who thinks post production like all the time, you need like a post-production supervisor that is thinking not how to cheat things, but how to make it work in 360. Because, usually like visual effects is 90% cheating, and 10% computer work. You need to find like the right pieces to do that. And here's the camera the opposite, so you need to find a VFX supervisor, or like DIT, or like 360 supervisor, VR supervisor how you would call it, that helps you find that way of doing things. And it's...I think there are people they are like really

really good at it, so people that just wanna make it safe, right? And if you wanna make it safe, people will be like “you can’t move the camera!” Well that’s make it...their job easy and that’s okay, but that’s not helping the directors, that’s not helping the movie, it’s just helping HIS job, right? So, you need to find people who are excited about doing something that is hard, right. And that’s a big difference, because I feel like in film, it’s easy to find people that like hard things, but when you get to bigger projects, you know, like, some people, specially people who make a lot of money, sometimes are really excited about trying new things, and some people don’t want to try new things, right? And that’s a big difference because you can have somebody in a traditional film that is playing safe, and that’s good for you, it’s helping you not fuck up, right? But in VR, you always need people who are like willing to fuck up, otherwise, we are, you know, we are not pushing the boundary, we are not pushing the medium, right? That’s really important.

circle:

Yes, I greatly agree. Can you explain the workflow on shoot? like... I know that you’re not using the cable, because there’s a walking camera, can you describe a bit about how you ...did you mount the camera on someone, and to move? Can you explain the workflow?

Josema:

Ya, so, there was a few things. One things is that we, there’s a Hannis, a guy that works in Marvel movies, works with Magnopus very often. He built a Hannis. And we looked for an actor, there’s a funny thing, we were casting because we knew that the actor had to have that camera

instead of his head. What we did is like, we tried to look for actors that were tall, and the main actor, the one with the camera had to be really short.

circle:

Because the camera is here (over head hand gesture)

Josema:

Exactly. Right, so what we did, because it didn't look that good, like what we did is like, we raised with foam, we raised the shoulders up to here (eye level hand gesture), right, so the shoulders for the jack that are up here (eye level hand gesture), the camera is up here (over head hand gesture), and the rest of the actor were taller, right? So that we would create the illusion of the camera is the height of a person, right? And then what we did is, we couldn't do that, we had a mount like...we hacked the Ozo, so we could actually take out... this is only that we talked with Nokia, and Nokia helped us, hack the camera, so we could get the most quality out of the camera...We took it out with a huge cable, I can't remember what kind of cable was, but like to a huge recorder down here (hand gesture - chest area), that was quite like 1.5 or 2 TB a minute, something like that, which's crazy, right? So, we had to like a really really thick cable to recorder, and they will have a receiver, a radio receiver to have a little bit of signal from the Oculus, but we couldn't really see what was going on. It was just enough to be like "action, cut", nothing else, right. So, we rehearse for a full day, the scene, like over and over and over. Timing it with a stopwatch, and it was this, until it was very very precise, very very precise. Changing a line of here will get little shorter, like changing the speed of this are little shorter. And I'll be like

always around, been like “Now this!” “Now this!” “Now this!” So, we rehearse a lot, A LOT, like a huge lot.

circle:

Like a theatre play.

Josema:

Ya. And it was really really hard. And in the end, we cut everything to 3 minute. So maybe was not necessary to do that way, but i think it gives an energy to it. There’s difference...you cannot do, if you don’t try to make it to one shot, right. And then, basically we had the DIT with a whole system, and, so we could like actually look that out of the Ozo, and like have a pre-stitch, because the Ozo like “stitched”, but it’s not completely true, like it still need to go through a process, so we need a system that could actually like play the Ozo back immediately. So, we have a DIT, like plug in through the computer in the Oculus, so we could actually like see what’s going on immediately. So, we’ll do like, first we settle that with one take, and then will check it out, we’ll like twist a couple things, then another take, but that would be like really really awful, because we will do like one take and wait for like 25-30minutes, and it was like, we could get like, may like 10 takes in a day, and that was not gonna work, so what we did was like the last three takes, we did like three in a roll, like we reloaded the card recorder, like changed, and then backed it up, and then go again. And that gave it an energy, you know that, because we gotta rush in, that was really good for the film. So everything was recorded here in the chest (hand gesture - chest level), and basically we were just pray that will be good, they won’t cut off, like,

they wont... the cable will stay there. Before we actually recorded, like we rehearse with a hat with a phone, to prepare the shots. So, we have a hat with the...helmet, i think that was a helmet, like a construction helmet with a phone attached to it. And just record everything (turning his head) with the helmet. So we just rehearse a lot. We prepare and prepare and prepare. We did a bunch of testing with the Ozo, it was all about preparation, really.

circle:

Right. Do you rehearse with the actual lighting? Or you light the scene up after you're ready to x

Josema:

No. The first day we shot like two things, the little memories, the usual fresh back scenes. We shot those first day, we shot a couple more things, in the middle of it. And...what else...ya, and they were lighting all day. So we did a lighting test at the end of the day. So also, it was not quite a rehearsal, but it was like "okay, the lighting's working, we need more light over there, we need more light over there" And, then the next day, we still add more light, because it was...it just a massive space, you know. And even now I look at it, I'm like "we needed more lights", you know.

circle:

Right, so the lighting is very extensive.

Josema:

Ya, it's crazy.

circle:

But all lights are practical light, they can be in shot? They are not film light?

Josema:

No no, there's a lot of film light. But what we did with the film light is like hiding behind walls, or pointing at the camera.

circle:

Right, right, just find a way to hide that.

Josema:

Ya, when that pointing at the camera, you don't see the stand. So, that's easy. And then if there's a wall that we never see, so we put a light behind that, you know, like just thrown light like a big chunk of the wall.

circle:

Right, right. And how did you record the sound? Do you use any boom or you use the lav mic?

Josema:

We have lav mics, for the...like a wireless lav mics for all three actors, and that was pretty much it, like there was no way of doing boom like in other shoots, I had like, maybe like a shotgun mic

here and there, like hiding in places. But for this, it was just impossible, because you cannot have a boom mic for all the way. So, we have to believe in the lav mics. I, maybe, like I wanna... I think I remember like a couple places, we had like something hidden somewhere, like a stereo mic (X finger) somewhere to have a little bit of background. But nothing more than that.

circle:

Right, understand. So...but did you spend a lot of time on sound post production?

Josema:

Um, not really. Not really because in the end we just chose to go with a strong music, and then, use dialogue as the driving force, and a little bit of sound design. But that was very very classic, that was nothing special to it. Um, it was stereo, nothing binaural, like got things go around you, it was a little bit of that effect, stereo effect, but nothing crazy.

circle:

I see. I see. So you said you are in the shot, so you actually didn't monitor the image and sound when the camera is rolling?

Josema:

No

circle:

Because the, cannot do the real-time of video?

Josema:

(noding head)

circle:

So you just watch playback after each take.

Josema:

Ya. The thing is...there were a couple moments were the extras had to react to what was going on, so i'll be an extra, and I'll be like (acting) "Ah oh my god" you know, go in, and then when they saw me, at the, at their way to come it, right. So, I was basically directing the extras within the scene. Because there was a lot of people and none of them are actors, maybe a couple of them are actors, friends of mine, but most of them were like random people. So that would... that way I could control the timing. And the timing was super important, because everything have to like happen like this, like this, like this.

circle:

Right, like real-time

Josema:

Ya.

circle:

And when you watched the playback, you watch on headset right, you didn't watch on flatscreen?

Josema:

Right. That's what we took like 30-40 minutes, because it will be like, I will watch it, and then Alex will watch it, and then the DP will watch it, and then the production design will watch it, and then sometimes the actors will watch it, you know. Because everybody had to know like what was going on to react to it. And because you gonna be a monitor, and everybody looking at the same time, will be like, you know, I think after first take, I think we took like an hour to a second take.

circle:

Right, right. So can I say that the pacing of shooting is very different from conventional filmmaking because we actually spend a lot of time on playback?

Josema:

ya.

circle:

Right, right.

Josema:

I mean, specially if you are moving the camera, and you have a big space, it gets trickier, because production design has to know like what's working and what's not working; lighting has to see what's working and what's not working. Because one thing is that during rehearsal the day before, and that very different thing is doing with like 60 extras, and like 30 people crew, and like...you know, few change, you know. So, and the actors doing it for the first time all the extras, so like, the actors had to know like "hey when you do this, you have to be very careful of this and this and this." Because the actor, the actor's also the camera operator, and he is the camera operator but he doesn't see what the camera records. So, that was like, that was...having the actor being the camera operator was very tricky, you know. So we had to find a person that was short, and know how to move. So this guy was actually an acrobat, so he could do acrobatics and act martial arts. So he was really good at like keeping balance and moving around. For 2 weeks or 3 weeks, he went everywhere around with a backpack full of books, was like...so he would be like used to having 30 pounds on. You know, it was all about like those little things, little details but made all the things easier, right.

circle:

Right, right. So the camera operator, he is a stunt man, he is not a actual camera operator?

Josema:

No, he is an actor.

circle:

He is an actor.

Josema:

He is an actor.

circle:

But he didn't have any VR experience, is it?

Josema:

(Shaking head - No)

circle:

Okay. Right, he has martial art, stunt experience.

Josema:

Ya.

circle:

Right, right. But he has to practise with the backpack.

Josema:

(nodding head - Yes)

circle:

It is very interesting. Right. Um, did he go on the test shoot with you? So that he knows what to do?

Josema:

Ya ya, he was...I mean we brought the actor to rehearse and stuff, but he would also come to like camera rehearsal and like testing. Ya, like, he prepared a lot. He prepared a lot, he was really good. Joshua, Josh futalit, Josh futalit, that's his name.

circle:

So you have...you did a lot of preparation and you did a lot of test shoot before the actual shoot day. You recruit your crew member at a quite early stage to prepare, because you have the 360 scenery, so that you need them to know what exactly they have to do.

Josema:

Ya, I mean, again, that's the easy part, because like you tell people... like when you go to a traditional film set, or you're like location scouting or xxx, you go you're like "that's the shot" (hand gesture - one directional single frame), you know, and they're like "Okay, so everything from here (left frame line), out, or here (right frame line), out, it's not in the shot." But when

you're going 360, everything is in shot. So they are like "okay". That's it, like the differences is harder, but there's no difference, right? It's the same for the grip, for electricians, set dressing, like PAs, like anything. For example, like the difference like PAs here, we're also extras. Because that way they could help me. So like everybody who could be an extra was an extra, so they will be like "on-set", you know. You're doing the same thing that will do like behind the camera, but this time they did on camera, right?

circle:

Right, that's interesting. How many...can you estimate how many percentage of your crew member are exactly on screen?

Josema:

Ah...not too many, maybe like 10 percent, maybe like...I mean we were like 30 people, so, it was like 35 people maybe something so, may be like 5, 6, 7

circle:

Including yourself?

Josema:

Including me, ya

circle:

Right, right, that's interesting. How do you feel about the spatial usage on location? Because um, for conventional film, you know what there's certain areas, there's certain district that are cut off from the frame, cut off from the on screen place, right? But for now, you are using a 360 camera, so there's no off screen space. So how do you feel about the space like in this sense between you and the actors, the distance between equipments and actor, the distance between everything, like, cause it's a lot of difference, right, comparing VR film set and conventional film set.

Josema:

Ya, the thing is all about...it's all about reality, right? Like, when you make a film, when you get a traditional film, you manage the eye of the spectator, right? And that means that in real life, we focus on things, right, like I can be looking at you, but if I really want to look at, you know, the fan over there, like I'm creating a close up of the fan that I see on your screen, right? And I do that, right? I constantly do that, right, I don't look just...for example, when I'm looking at you, I'm not looking at your room, I'm looking at your face, right, I'm looking at your eyes, right? But if i want to look at the TV on, or whatever's in the background, that like I'm not looking at you, I'm seeing that, and I see you in the background of my, you know, of my eye. The thing is, when you are in real life, you know, if for example, I am talking to you at a bar, like on street, you know, I'm talking to you, and then suddenly getting really close (head coming close to camera), it's not my face getting bigger, you FEEL that i'm getting closer, right. Something inside you, you're like "Okay, I need some space." (leaning backward) right? Or "I need, you know, like air." So, that's when it matters, right, in virtual reality, like playing with that, it's not just like

what's important, it's what's close, or what, how something that's close or far making you feel, right? So, you can intellectualise it because in film we have like the theory, the whole theory film, you have like establishing shot, you have a close-up, you have a medium shot, you have a couple shot, like all that stuff. But when you have virtual reality, what you have is a god feeling of how things make you feel, right. And it's not the same being alone in a room that being crowded in a room, right? In film, you don't react differently from like somebody, that's thrown people in the room, with the stupid can in the room. If it's a close-up, you don't feel the people in the room, right? You only feel one person, right? But in virtual reality, you play with that. You don't play with the gaze, you don't play with the attention, you play with the sensation of the room, right? And I think that there's thing that VR cannot do, like I do I really think that film there's things better than VR, like, for sure, like because you can't like create the empathy of a close-up in VR, I mean you can try, but you're gonna build the all those things, right? You're gonna build with acting, you're gonna build that with like setting or like closeness, that you're gonna create the difference kind of relation between the VR and the actor or the action. So, like, we are using space and speed, and spaces speeded everything, which is completely different from film, right? Because in film, and traditional film like you can go really far away and use that telephoto lens, and then you're far away but you're really close, and the feeling of closeness is bubbleble, because you feel that you're here, and you are also separating with the bokeh, the blur, separating the rest of the scene, right? But in VR, that's doesn't exist. You don't separate, you don't isolate, it's all everything at the same time, always, right? So you have the speed, speed and closeness, speed and distance, right? And you have height, that's something that our real world, talking about when we're making Argos. It's like there's no way to feel height in film,

like you can have vertical and you can have like “oh, you see a shot with that (hand gesture - high angle, top shot).” But you’re not gonna feel vertical, you know. But you know you’re gonna feel vertical in video games, you know. If you fall off a cliff in a video game, you’re “Ah...”, you know. That FEELS like vertical. So, height, distance, speed, that’s also your tools. It’s not about size of the shot, it’s not about like, I mean, you use music, but it’s not about like “Oh, cool music, um I’m gonna cry.” You know. It’s about speed, height, distance.

circle:

The reality.

Josema:

Ya, and those things, how they make you feel, how those make you feel when you invaded, in your own space; how do you feel when somebody doesn’t want that bit closer to you, and you don’t wanna get closer, but the, they get further away; how does it feel when something’s this small or something’s really big, you know. That sort of things that really matter, like, in film Tom Cruise is really short, right? But it doesn’t matter, right? But in, if you wanna have somebody that feels like a hero, or like something like that, in VR, they have to be tall, they have to be big, they have to be in a highest spot, you know, they have to use those things to make feel like something you’re in the way your routine brainwork is reacting to that the same way they react in reality, not in film, right? And that, it just changes everything.

circle:

Right, right, that's interesting. So for the filmic space that you have to bring the reality to the filmic space. And so what about the location shooting? The spatial usage, can you tell the biggest difference of the spatial usage of the on location shooting that instead with, we have to play the one of the extras to cue, to verbally cue...Did you verbally cue them? Or...ya, how did it work on location?

Josema:

I mean, I think I've talked a lot about it. But it's that, the fact that you gonna see what's going on, that, and when you're able to see on a screen, you're gonna see the whole experience that you don't feel it, and it's very important that you FEEL what's being recorded, because in regular film you watch the screen is fine. But in virtual reality, like, you can see it on the screen but then you have to put it on (headset) and be like "oh this is what it feels like." Because it maybe like the palace might be broken, right, and when the palace is wrong, like then, it's not good. Um, stuff like that, and then, the fact is, there's 360, I mean you can do, you can be smart and do like still camera, no move it, and then do it passive, and then shoot this side, first, and then this side, and then this side, and then that side. So you can hide it there. Or you might hide anywhere. Or you can build something in the set dressing that hides you. You can do all the stuff, but you always have to do creator, like how do I hide the team, how do I hide everything...um, ya, how do i make it work, because the only...you need a space that tells, that gives you the experience that you need, right? And those spaces are fewer when you need 360, because you can find a place that's awesome just this one corner. So location scouting changes, decision-making changes, and then the shoot, you just get harder.

circle:

Right, right right. Um, yes, I think we have covered a lot of a lot of interesting points so far, about how to create the trailers and I really look forward to watching the whole game, although I don't really play game.

Josema:

Hopefully, hopefully (hand gesture - finger cross)

circle:

It's really really cinematic. And um, so to conclude today's interview, one more last question, can you describe the biggest difference between your role as a VR film director and a conventional film director?

Josema:

Um...it doesn't change that much. It's just...when you think about film, film is everything, everything has been done, right? Tomorrow, to bigger or smaller degree like everything has been tried, right? There's so many things that are "convention", right? Like the hundred years ago, they were groundbreaking, like the eyecious style, or like Moon Now, or like Nightmare, right? Like everybody is creating something for the first time. So, that's what VR is for me. Like the difference, not too much about the way it work, it's more like the way I think, and the more I feel that everything I'm doing something, it's very possible that I'm the first person ever try

this out. And that's really exciting, right, it's like, I think that was exciting to me about Argos was like we were doing things that I knew for a fact that nobody had done before, right? And we were like trying to figure out how to do it for the first time. And that's the biggest difference. Like, in my logic, and in the way I think, it was not that different but in practicality, that was the big difference, like "Okay, how do we do this for the first time?" That's the real thing, that's what exciting about it, that's what hard about it. I don't think that's THAT different from what I really did, because I love doing long takes, I love telling everybody like "everything is set, I want everything to be part of the mood", that's the way I operate anyway. So, for me, it's a very easy transition to VR. It was just how to make it work technically, and how to figure out how to do something for the first time. That's was, that's the big thing.

circle:

Right, right, right. That's really insightful. Because I feel that we are, now actually like back to the base that we first have cinema in this world, and we're actually exploring a new medium. Ya, I think we have covered a lot of interesting point of your film. And thank you so much for today, director Josema. And I wish I didn't take a lot of time with you, I expected to be one hour,

Josema:

That's all good.

circle:

We run a bit late. And I good luck to your shoot in the jungle.

Josema:

Thank you

circle:

I hope you have a very fun and adventurous shoot.

Josema:

I am sure it will be!

circle:

So I will talk to Joshua next week some time. Let's talk more if we have chance.

Josema:

Awesome, awesome.

circle:

Ya. Thank you so much for your time

Josema:

Thank you so much, circle

circle:

And your generous help. And so um, we can end the recording now.

6. Screenwriter Joshua Rubin

CVR project: *The Argos File*

360-degree, non-interactive, trailer, live-action

Duration: 3 minutes

Release Year: 2017

(circle - Interviewer; Joshua - Screenwriter Joshua Rubin)

circle:

Okay, so, in my research, I am comparing the two alike but different art forms which are "conventional film" and "Cinematic Virtual Reality". Some categorise them as the 2D and the 3D respectively. But "conventional film" and "Cinematic VR" are more appropriate in academic research.

Joshua:

Sorry you're saying? The "conventional" and "cinematic"?

circle:

"Conventional film" as in the regular film, and "Cinematic Virtual Reality".

Joshua:

"Cinematic Virtual Reality", got it, okay.

circle:

Ya. So, I am using the words "Cinematic Virtual Reality" instead of "VR film", but since "VR film" is more common and widely used, we can still say "VR film" during our interview. Do you usually called it "VR film"? Or do you use another term?

Joshua:

Um, 360 video, this way, generally called it, separated from 6 DoF, 6 degree of freedom CG.

circle:

I see.

Joshua:

Ya, the limitations of 360 are very real, and very much affect what can do with it.

circle:

Yes, yes, completely agree. Ya, so, some...ya, 360 video. But for my research, I'm using "Cinematic Virtual Reality" because I want to differentiate the cinematic view, the story-based, character-based 360 video to those like static, like museum tour, or just a virtual tour of a place. Ya, so in that case, I just define in an academic way.

Joshua:

huh

circle:

So, let's begin with your background. How long have you been writing for VR films? Is it your first time?

Joshua:

Um, The Argos File was the first thing ever in VR. I've been writing video games for about 10 years, and 've been writing movies for about 10 years before that. So, i've been in this industry about 20 years. Um, the first VR that I saw was the DK1, when I was working at Bungee on Destiny, and I saw this and I thought "Oh this is the future I want like get into VR." And I started kind of making efforts to get out, and meet people and start trying to conceptualise what would I do in VR, that would be making difference, that would be necessary to be made in VR. And when I met Josema, he was already working on this idea for The Argos File, and I thought that is brilliant and "I wanna help you with it." And we started working together right away, we spent a few years working together. And the project was very successful, and opened up a lot of doors for it, and I worked on quite a few other VR projects since then. But this is the only 360 video piece I've done, everything else is been 6 DoF, 6 degree of freedom.

circle:

Right. Great, great, great. Um, I don't mind that...although this interview I said is to understand the screenwriting process of The Argos File, but since as you know that I'm also doing, actually doing an overview of the industry. So, if you have something that you want to share about other

projects, you... ya, feel free to share...the virtual reality screenwriting process. Yup, so, to focus on the The Argos File, how does the script of The Argos File look like? Is it in textual or graphical form?

Joshua:

It is written in FinalDraft, in text.

circle:

FinalDraft, in text. And is there any graphical...written form...is there any graphical format for the script? Like um, cause I read some other scripts online, that some screenwriter they will use, they will write a circular 360 degree, write a circle on the paper, and then to define where to put the characters. So, did you do that, something like that?

Joshua:

We didn't, no. I think, maybe, because it was written as a POV script, so we always knew where the character who was experiencing was facing. And, so, we would write what they were looking at, what they were doing. And then we knew the that was the primary action was going to be, and everything else would be in the preferry. And so we would write in, you know, a little bit about what was happening in the film around them. But mostly was just the one action happening. The, this is what the trailer though. The goal for the final project that we never got to make was to have multiple things going on simultaneously, to have scenes and situations that were set behind you that you would not see in the first time, that the drama what was

happening in front of you would be so engaging, but that you would have to go back and watch it again, and turn around to look for other things, to follow other parts of the story and get other clues in order to solve the mystery. The trailer is linear, but the game itself is designed so that you would go into memories, and within the memories, you would find these flashes of other memories. And when you did that, you would then unlock those memories, and go see those, and with those you begin to build the story out of order by finding all these pieces of memories; and each memory it would be expected you would walk to see multiple times to catch all the difference things that were going on, and how it's all related. Um, so, but at no point did we ever do the circular diagram, it was always in text.

circle:

I see I see. Even for other episodes that which have not been produced, is all the script of that episode also in written form?

Joshua:

Yes, it's all on FinalDraft.

circle:

I see I see. So, speaking of the trailer of The Argos File, how did you visualise the script to other crew members?

Joshua:

How do we share it?

circle:

how did you visualise, like, cause it's all in XXX form, ya, how did you share the vision, or did you XXX visualise to them, what's happening in 360 degree?

Joshua:

Um, so, I mean that's more of a Josema question, right? How did you...you know, I think he's the one who really has to visualise it as the director. For me, it's really, I think as a writer, you always think in 360 anyway, because although you, you know, or maybe in your head picturing, you know, what the camera is gonna see in a traditional film, as a writer, you really imagining the experience for the character. And I think you're imagining it almost as you're living it when you write it. And so, I think, you know, when I describe a world that the character is going into, when I describe, you know, this underground futuristic party that player, the character is gonna go into, I'm describing everything that's happening there. Everything that you would see in a traditional film, the director will then use that's as an inspiration of pointing the camera at this, and point the camera at that, and guide the viewer into what they're gonna see. In a 360 film, they just create the entire space and move the camera through that knowing the player will, you know, or viewer will look around and see different things on different journeys through. But as the writer, it doesn't change the description of the place, the world, the building is always the same.

circle:

I see, I see. So, what's happening on the viewer's left and the viewer's right that happen simultaneously right? But you don't have to describe it dedicated to like what is happening on the left and right in front and background, but instead you just describe the whole world?

Joshua:

(nodding his head) Because for the trailer, it really was the only one story happening. You only, I only describe what the central action was, and then the world that it was happening in. For later episodes, there was the idea of having multiple things happening at the same time, but even then, because the sequences were short, there was never the idea of writing the, you know, on different sides of the paper (hand gesture), but more that they were be written, you know, left side of the script, then the next page, right side of the script, not the script, left side of the room, right side of the room, behind the player, they will just be written one, then the other, then the other.

circle:

I see, I see. So, do you find any difficulties in scripting for 360?

Joshua:

Do I find it...do i find anything difficult?

circle:

Ya, any difficulties or any differences the conventional filmmak...ah the conventional screenwriting and the VR screenwriting?

Joshua:

I mean one thing that really stands out is that you can't do close-ups, you can't do focus on the document in his hand, you can't do, right? It's all about...if you want the player, I say player a lot because I'm, you know, come out of game the spine, you want the viewer, if you want them to see something and focus on something, you have to bring it toward the camera, and you have to give them a reason to look at it. There has to be, you know, something that's gonna draw your eye to it, rather, you know, is, you know, whether it's coming at the camera, or being dropped in front of the camera, or it's something that's happening with a light on it, you know, to happen if somebody is coming in door in distance you need to light it, so that they are going to be drawn toward it. So, you don't have a way to focus the eye in a traditional way.

circle:

I see, I see. Um, moving on a bit to the production. Were you there when they did the location scouting or the recce?

Joshua:

I wasn't there for the location scouting, no, but I was there for the shoot.

circle:

Ah, okay. What's your role on the shoot?

Joshua:

So, I didn't have an official role. But I was a centrality of the story keeper. So I will make sure that the character was staying true to the characters that we had written, that as ideas came up on the fly that they didn't conflict with the basic story that we were trying to tell.

circle:

I see. Did you prepare any shot list or storyboard together with Director Josema?

Joshua:

I didn't, no, it was all him.

circle:

I see, I see. Director Josema also told me that they did a lot of test shoot and rehearsal. So, were you there also?

Joshua:

Did you say a lot of test shoot?

circle:

test shoot ya and rehearsals.

Joshua:

Ya.

circle:

Were you there to help it?

Joshua:

For some of that. For some of it, ya.

circle:

Just to make sure that the actions are all clear and stay with the script, right?

Joshua:

I will say that in...mostly I was there as a guest and a deserver that my work was already done.

Um, afterward, I think we had decided that probably would be a good idea for me to officially be working as a script supervisor, since we didn't have one on the set, someone who was there with a script in hand, and tracking what were shot, and what wasn't shot and tracking consistency, that would've been useful for me to do. In the end I didn't do that, I was there just, you know, enjoying the magic of being on a film set, that something I have written.

circle:

I see, I see. And did you get chance to watch the playback? Because I heard from Director Josema that it takes a long while to share the headset around and to let everybody to watch the headset. So, did you get a chance to watch it on set?

Joshua:

No, we had a video village with a monitor that had multiple circles showing kind of each directions that the camera was, each camera that was, each lens that was on the camera individually, showing what it was capturing. But it was being kind of work, not work, but it was in the spread out 360 before that being brought together, it was very hard to read, really hard to understand what the experience would be like from the circles. And because there was only the one monitor, the headset, it was really for the director. And sometimes, you know, the head of the VFX or the head producer, I didn't really have a role at that point where necessary for me to see it.

circle:

I see, I see. Can you describe a bit of your working relationship with Director Josema?

Joshua:

Sure. We developed the idea together, built up the script and characters, which a very much a partnership. Once the producer Michael Steiner came on board, he was very involved creative role as well. Um, and then, once Alex Henning whose was the head of Magnopus that made the film, that was the production company and effects company, they were involved very creatively

and creating the look and the feel. And, you know, the final editor of the trailer came from Magnopus as well, what the final, the final version of the story look like. But in terms of the creative process between Josema and I was really in our talking about in the beginning, why is this story needed be told in VR, why it can only be told in VR, the fact that is from, you know a, told from a character's point of view, and about you as the player experiencing what in other person's experience is like, by seeing the world through their eyes, that that could only be done in VR and the fact that as a viewer VR...the fact that you cannot move, you can't do anything, you can't affect that at all, what was one way that you could affect it? It was to rewind it, or fast forward it ,or to pause it, or to hit links inside it. And so we created the storytelling method that used to know as your superpowers, you're the detective reviewing another person's memory to find out why they die, so there's some mystery, and you have the power to search through that memory, to find a hyperlinked other memories, connected memories, an "Active Link" we called them. So, we came out the idea together and then built that, build the story around there, um, bouncing ideas of each other.

circle:

I see. So, your job is mostly in the pre-production....um, can I say pre-production of the film?

Joshua:

Yeah, that's right.

circle:

Right, I see. And did you invoice in any post-production when they try to stitch the footage?

Joshua:

(shaking his head) No, not at all.

circle:

I see, I see.

Joshua:

And that's very common in conventional film as well.

circle:

Yes, yes. So, um, you wrote the conventional script, conventional script for films, right? Like film....yup, ah, is there any difference in the textual forms? Like there are certain formats that we use in conventional script. Yup, so is there any difference of the script that you wrote for Argos File trailer and the conventional script?

(silence)

Joshua:

um...

circle:

You can say in two ways, in the format, or in content-wise

Joshua:

Ah, simply content-wise, right, and that, we specifically were trying to tell a story that could only be tell from the first person point of view. So, writing from first person point of view means you know your one character is never seen, because you're inside their head, so you have to be very aware of the amount of dialogue that you give them, how you get to know that character without being able to see their face, when do we see their face, making sure we have all opportunities to see them on camera, in this case it was special in photographs some of them beforehand. Um, you know, because it is not unique to, you know, VR, there are films like "Cloverfield" to that work shot in first-person which also struggle, you know, with these questions. Um, the other aspect is that, you know there are, because this is written as a trailer for an interactive game, the game script itself was much more the game scripted, much more interactive, and it was very much meant to be non-linear, but to have multiple sequences that would be viewed in any order depending on how you found them, when you found the pieces and what order you discover them in. And so that's certainly unique to a game script, um, an interactive script that you don't have in a conventional linears film. But for this, this was very much, kind of, focus of the script was "let's show an evocation of the world, and what the game could feel like." And, so, it's very linear what we ended up making.

circle:

I see I see. So format-wise there's not much difference, right?

Joshua:

No.

circle:

I see, I see. So, I think, we already have covered most of the questions that I have prepared, but to...I have one more last question before we can conclude today's interview. Can you describe the biggest difference between your role as a VR screenwriter and a conventional screenwriter?

Joshua:

Um, I mean I feel like I've already covered that. Um, you know, I think that...this project was unique in that it was, it was linear and not meant to be seen multiple times with multiple stories going on simultaneously, there are other VR, 360 VR film, 360 VR projects that I have worked on where you did have to break it down into what storyline is going on your left and what's storyline is going on your right, knowing that the sound that you're hearing that only come from where you're watching. So, if you turn into a conversation on your left, you will hear that one; turn to the conversation on your right, you will hear that one; if you turn around, you will hear and see something else. Then there's other VR game and VR experiences that I have written which are not-linear, and they're not film, they're 6 DoF and so they are generated as you interact with it. And for those is much more about creating possibility basis, creating moments that can happen as you interact with them, as you move the story forward. And to that, it's a

very different kind of writing from a traditional screenwriting, cause it's really about providing moments for the player to discover and letting them find the agency that moves the story forward.

circle:

I see, I see. Can I conclude in this way? That if it is for linear story, a script for VR, it will pretty much the same with conventional film script. But if it's non-linear, then the, you might need other tools like a graphical script or a script in table form to help to visualise the script?

Joshua:

That's the good distillation, yes, that's right.

circle:

Okay, okay. Do you think you can share some experience of some linear, non-linear screenwriting for VR?

Joshua:

I'm sorry.

circle:

Do you think you can share some experience of your writing, the non-linear script for VR? You can don't mention the names, but since a general workflow, like what's the script look like? ya.

Joshua:

So, one published game that I wrote is “Groundhog Day”, the sequel to the marine movie was written as a interactive VR game. And in that one, it’s written on a flow-chart, where through the game, you are making choices in dialogue, and so the dialogue bubbles come up in front of you, and you decide what you want to say by choosing a bubble. And then you hear your character whose your body are inside to say that. And then the character you’re talking to responds to you. So, that’s written in a flow chart, there’s a bubble chart. There’s also multiple stations, multiple characters in the space that you can go in to interact with. And, so, you know, you choose this and written as different bubble charts throughout the page we use a screenwriting, ah sorry, a flow chart maker we called Miro, M-I-R-O, as a primary tool. And, so, we would have the Miro flow chart, and simultaneously a FinalDraft script, and try to match them up as much as possible. But for not-interactive (correct to) for interactive VR, it can get pretty crazy. It can definitely be a vast sprawling brain network of ideas and connections.

circle:

Right, right. Can I say that the Miro flow chart is even more extensive for VR video game than the video games that which will be played on the flat screen?

Joshua:

No, not necessarily, because it also work on you know flow chart based game that working at Telltale where I wrote a lot of games, they were also extremely complex flow charts. So, I would

say the main difference between telltale and a VR, a branching VR game, is the amount on that can happen on the same space. Generally at Telltale, it was relatively linear, of linear story, we're making choices and that changes what happens next in front of you; the fact that in VR, you can step away and do something else at any moment. And so, and there's so much physically play with and do in the space that needs to have its own dialogue, and its own story shift as a result. So, from that sense, ya, I would say VR could be in more complex way, ya, flow chart.

circle:

I see, I see. This is very interesting, it opened up something that I've never thought about. And um although it is not really related to my research, and I really hope to talk more. But um maybe let's put a stop here, because I don't want to make the interview too long. So that, ya. Um, let me stop the recording first, then we can round up.

Joshua:

Sure.

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