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<th><strong>Title</strong></th>
<th>CAREFREE HEART : a wearable ECG system for real-time heart monitoring</th>
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<td><strong>Author(s)</strong></td>
<td>Zheng, Kaixi</td>
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<td><strong>Citation</strong></td>
<td>Zheng, K. (2014, March). CAREFREE HEART : a wearable ECG system for real-time heart monitoring. Presented at Discover URECA @ NTU poster exhibition and competition, Nanyang Technological University, Singapore.</td>
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<tr>
<td><strong>Date</strong></td>
<td>2014</td>
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<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10220/24259">http://hdl.handle.net/10220/24259</a></td>
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Electrocardiograph (ECG) is the most popular non-invasive diagnosis test that reveals key information on the heart’s electrical activity. Doctors make inaccurate diagnosis because they only see patients during their short hospital visits.

To avoid frequent and expensive hospital visits, and to service patients with rapidly changing health states, we introduce CAREFREE HEART, a wearable ECG system that helps a non-medically trained individual monitor his or her heart condition instantaneously with clinical precision. This leads to early detection that dramatically reduces the incidence of fatal heart attacks.

Cardiovascular diseases are the No. 1 health killer, accounting for 1 out of 3 deaths in Singapore.

Current healthcare system cannot accommodate the rising need of our aging population.

Doctors predict impending illnesses using intelligent information systems.

CAREFREE HEART
A Wearable ECG System for Real-Time Heart Monitoring

Problem

Solution

Key Features

Sensing Unit
Low-noise electrode in close contact with skin surface collects electrical data.

Communication Unit
Bluetooth communicates remotely between microcontroller & smartphone.

Application Unit
Smartphone displays information in an intuitive user interface.

Processing Unit
Embedded in the wearable fabric is Arduino Uno microcontroller, an open-source architecture similar to the chips in conventional 12-lead ECG devices. It processes data and identifies various health states real time.

Highlights

- Embedded system light and comfortable
- Easy access anytime anywhere
- Real-time data collection and feedback
- Highly accurate and reliable information
- Instantaneous data transmission
- Quick to learn and simple to operate user interface

Future Development

Stage 1
Customers create personalized health profiles online over time

Stage 2
Doctors diagnose and give suggestions based on health profiles

Stage 3
Doctors predict impending illnesses using intelligent information systems

Project Title: Design and Development of an Intelligent Portable Low-cost ECG Monitor System with High Accuracy

Supervisor: Prof Er Meng Joo

Category: 3
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Project ID: EEE13266