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Brain activity study on olfactory stimulation via Electroencephalography

Introduction
• Electroencephalography (EEG) is the recording of electrical signals generated by the brain.
• EEG had been used for past diagnostic application in neurology.
• EEG proves to be an important instrument in research, especially when higher temporal resolution is needed.

Objective
• To investigate the steady state behavior of the brain to arousing and calming odours at different intensities by using EEG
• To identify and analyze different odours using EEG

Algorithms

- **Scent (Different Intensities)**
  - Peppermint (Arousing)
  - Eucalyptus (Arousing)
  - Lavender (Calming)
  - Ylang Ylang (Calming)

- **Fast Fourier Transform**
- **Peak Detection**
- **Feature Extraction (Entropy)**

- **Classification (Support Vector Machine)**

- **Template of Different Scent**

- **Scent Y**
- **Fast Fourier Transform**
- **Peak Detection**
- **Feature Extraction (Entropy)**

Preliminary Results
• Experiment were conducted for 2 scents, lavender and ylang ylang at two intensities.
• Red signals represent the higher scent intensity while yellow signals represent the lower scent intensity.
• Channel used were Ground: FPz; POz, Reference Cz, Channel 1: C3, Channel 2: Oz, Channel 3: C4, Channel 4: Fz, Channel 5: P3, Channel 7: F3
• The 2 graphs below show that higher scent intensities have greater impact on brain signals.

Potential Applications
• To invigorate workers using arousing or calming scent at appropriate intensity
• To identify and classify scent into different types by using EEG