

EEmotion

5,600,000 Americans

Are paralyzed to some degrees

1.9%

Of the population

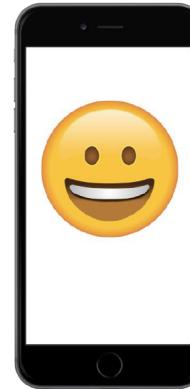
40,000

Are afflicted by facioplegia

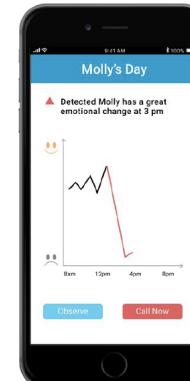
Problem: Communication difficulties

EEmotion

- Make communication more natural



- Provide an opportunity to feel the family support
(Receive a notification when the one you care about is sad)



What is EEmotion?

EEG-Based smart device which recognizes emotions from the brain activity

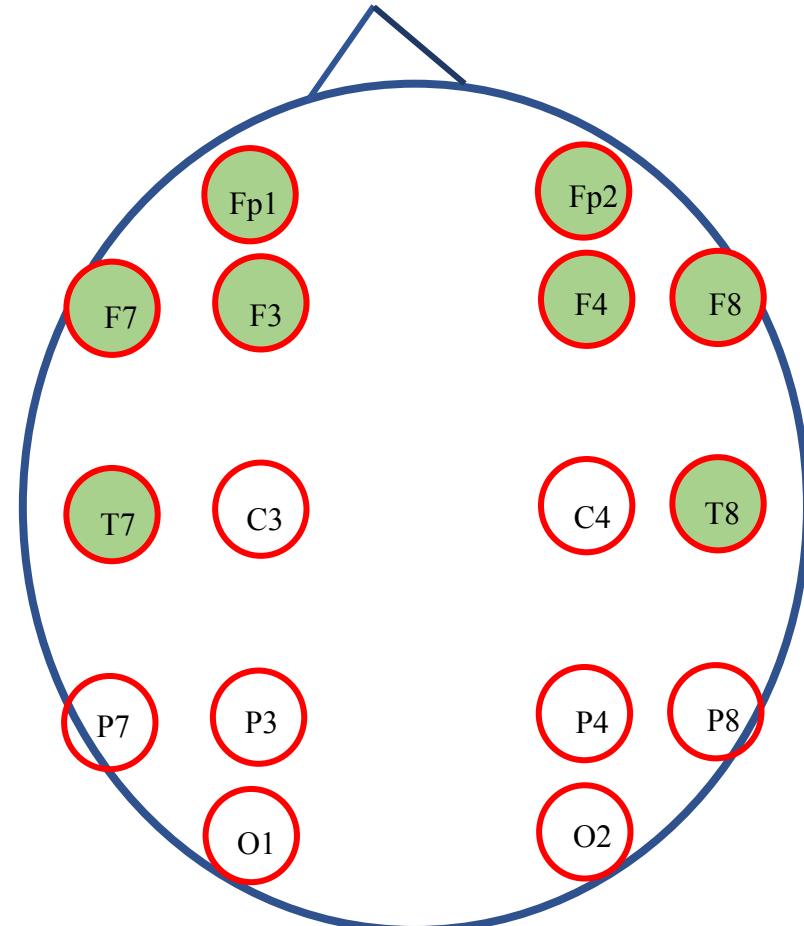
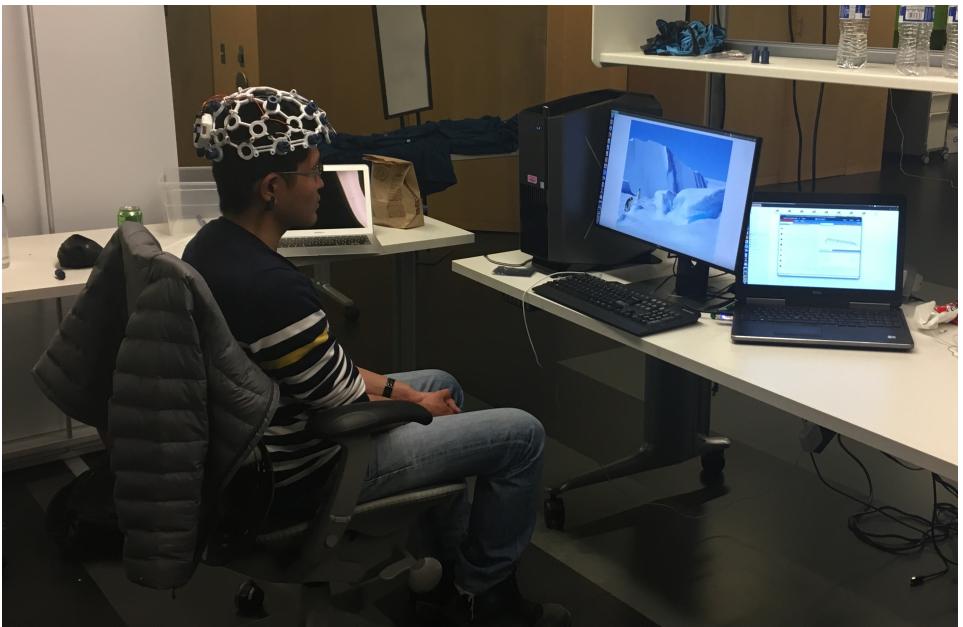


Implementation

- Experiment and Recording
- Filtering and Feature Extraction
- Machine Learning Model

Experimental setup

- GAPED Dataset
- EEG





Model

- Feature extraction: α , β , γ , θ waves
- Random Forest, 3-class classification
- Results: 0.77 accuracy on 18% test sample
0.65 cross-validation score (4-fold)

Demo

Additional Applications

- Learning
- Marketing
- Focus control (traders, pilots, surgeons)
- Recommendation

Possible Problems and Misuse:

- Privacy concerns
- Even more personalized spam
- Marketing

Future Work

- Record better data(No noise)
- Use stable EEG
- Combine with EMG, video-based emotions recognition

Combine EEMotion with video and EMG based emotions recognitions provide feedback to people with partial facial paralysis for training and recovery!

Thank you for your attention!