

Brainprint: A Psychophysiological Biometric

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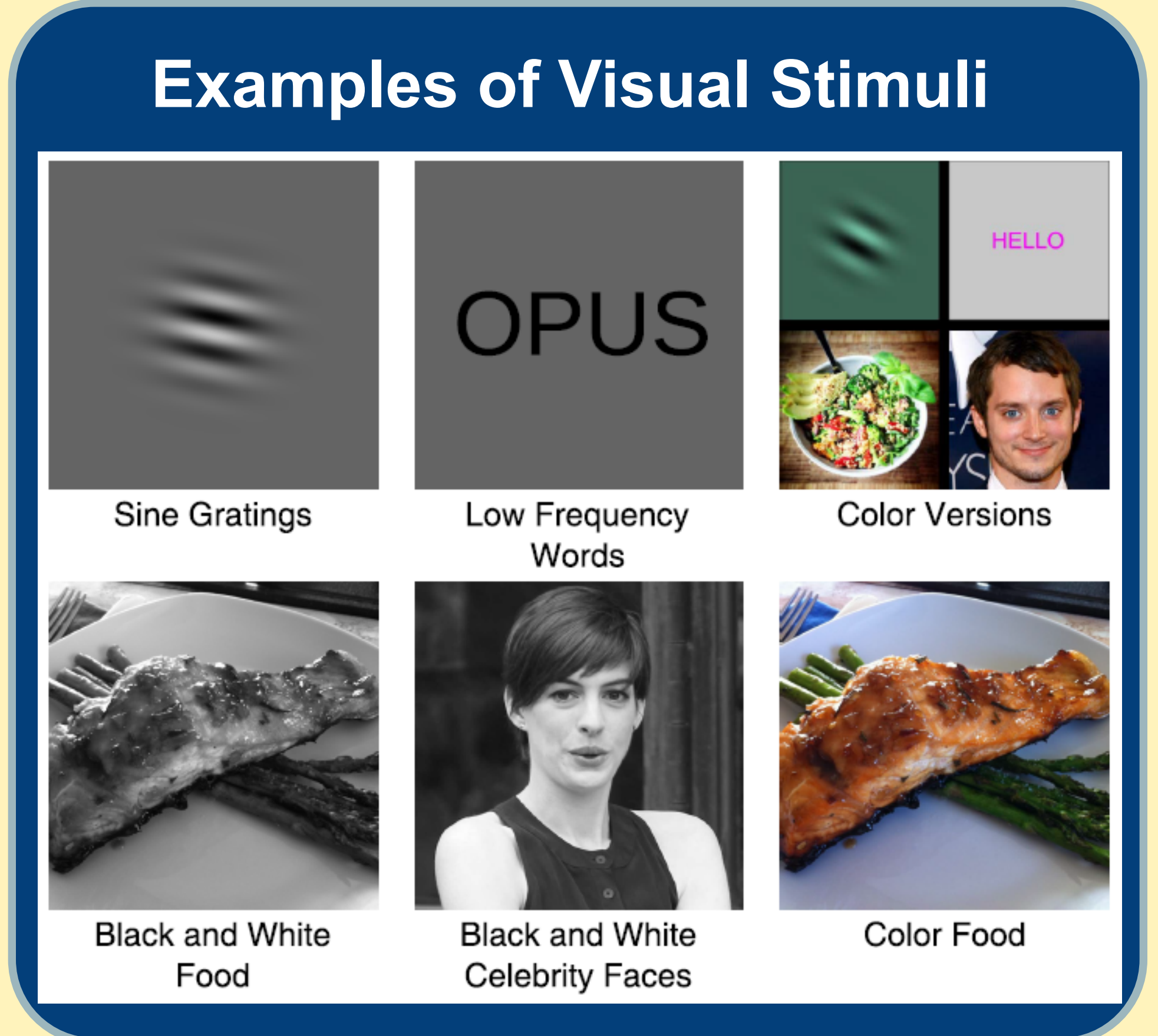
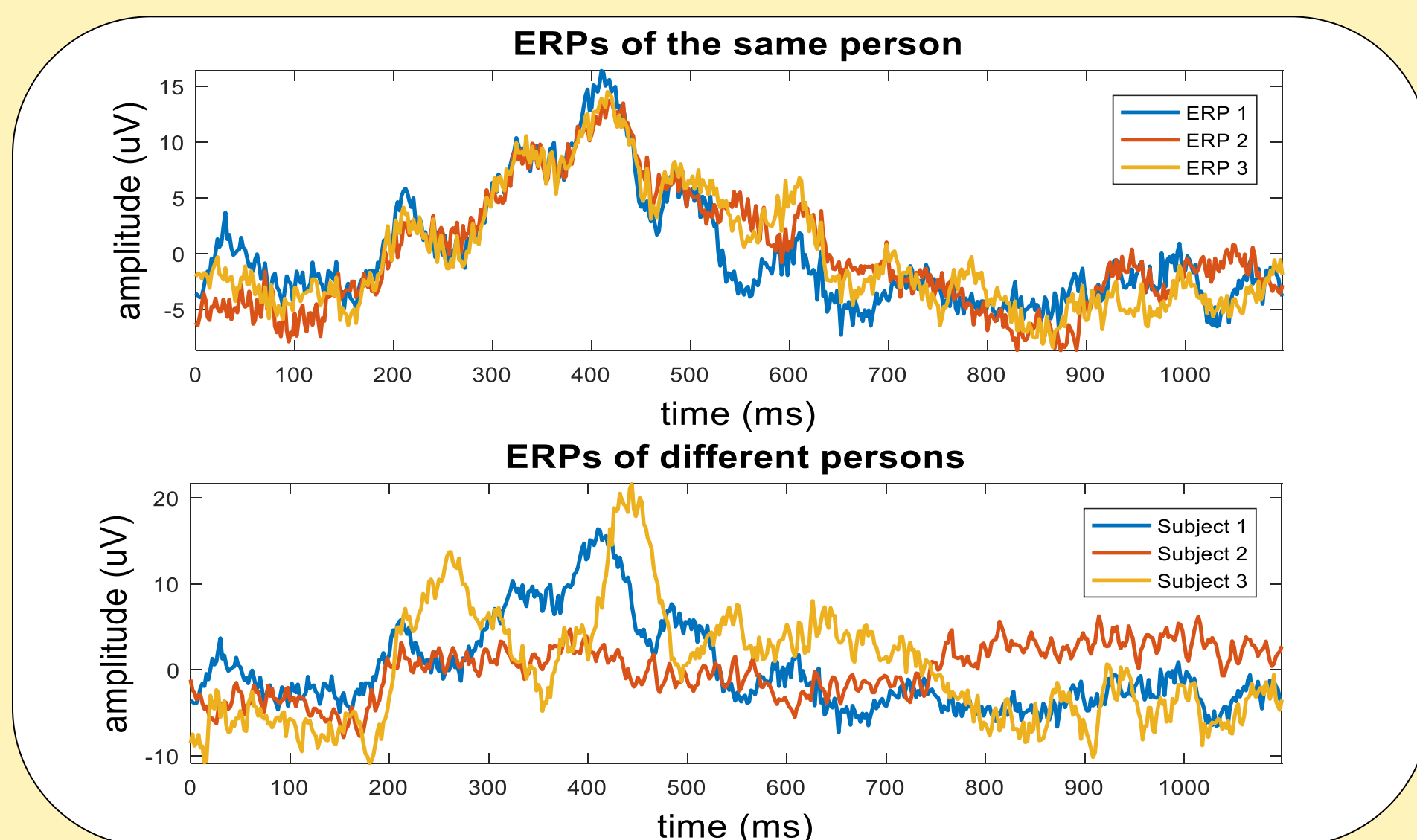


Motivation

Brainwaves, especially the Event-Related Potential (ERP), which is non-volitional- can be a promising biometric.

Advantages of brain biometrics:

- Safety for the user, not only for the system
- Practical solution to attacks that cause duress
- Quantify the cognitive uniqueness
- Cancellable



CEREBRE Protocol

Sine Gratings

- Primary visual cortex

Low Frequency Words

- Left Anterior Temporal Lobe

Color Versions

- P300: Decision Making Process

Black and White Food

- Ventral midbrain

Black and White Celebrity Faces

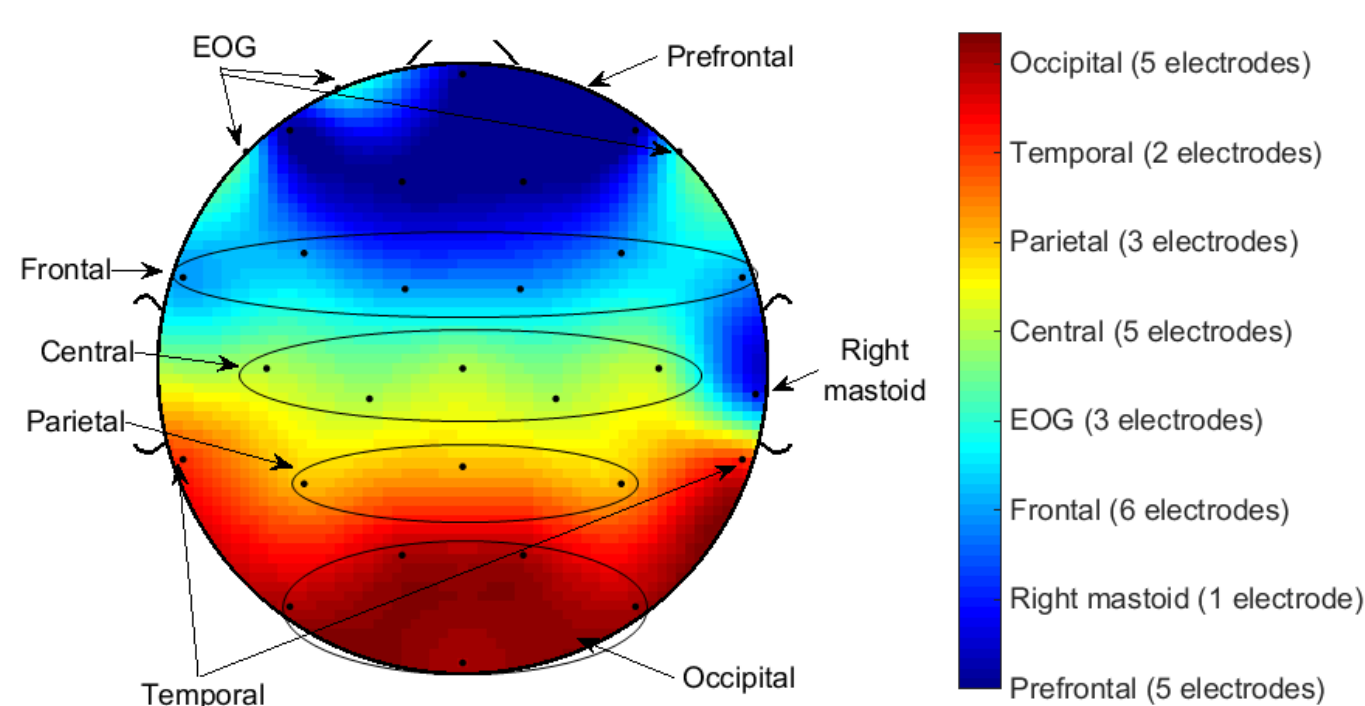
- Orbitofrontal cortex

Color Food

- Ventral midbrain

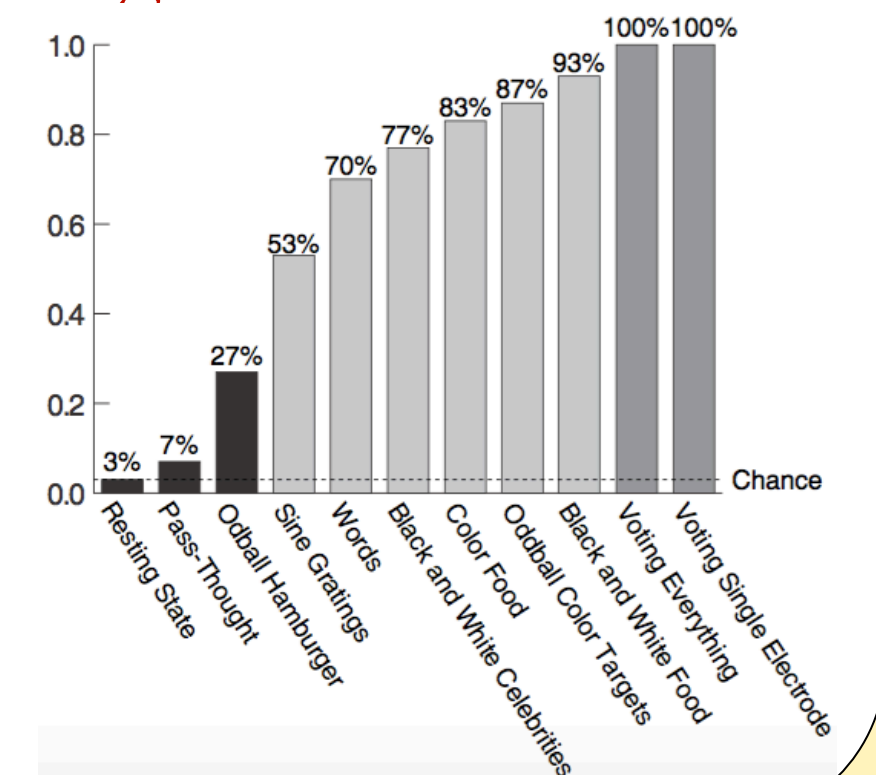
Methods

- 50 subjects
- 1.1 seconds @500Hz
- 30 channels



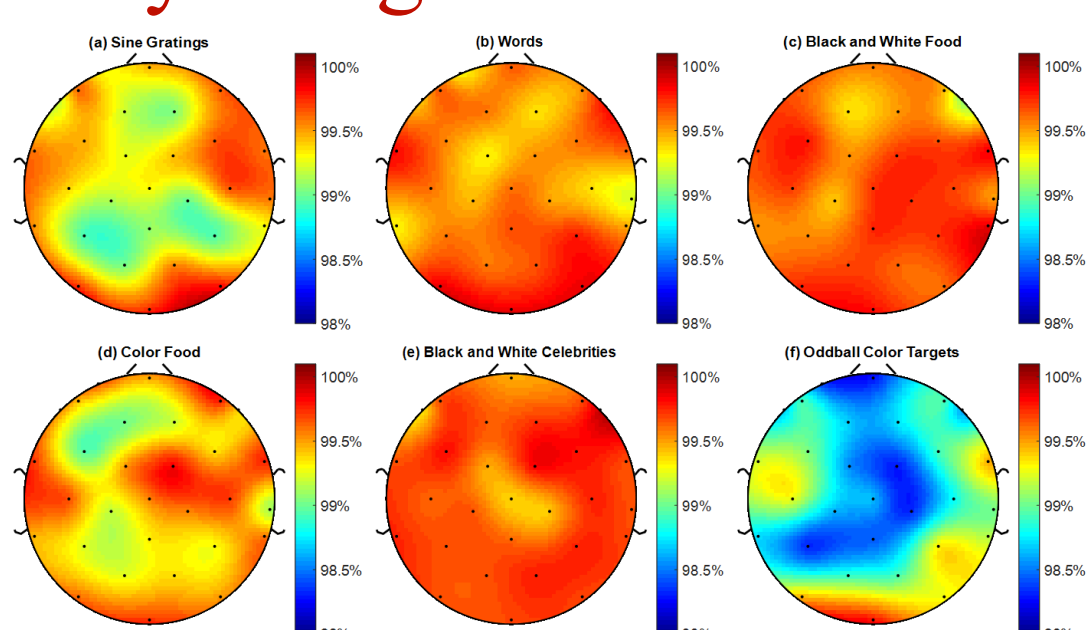
Identification Accuracy using Cross-Correlation

- High accuracy compared with traditional protocols, e.g., resting state, pass-thought
- Data fusion can provide more accurate identification



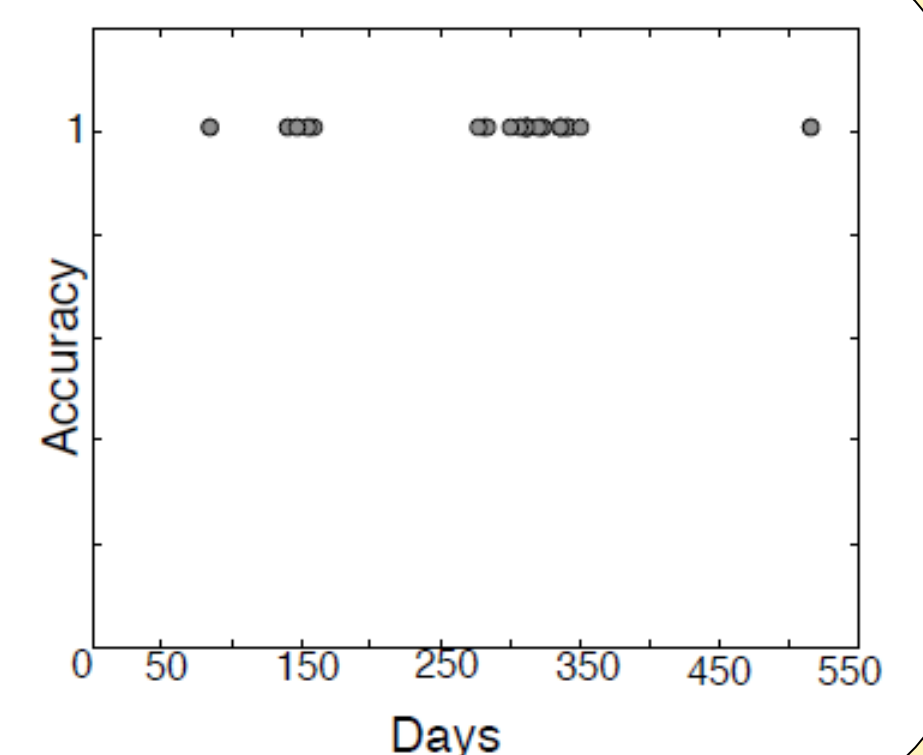
Identification Accuracy using Convolutional Neural Network

- Unsupervised feature learning
- High identification accuracy above 98%



Permanence

- 20 subjects returned for additional testing
- 48-516 days interval
- High accuracy even at the longest duration



Interested in meeting the PIs? Attach post-it note below!



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