MyoKey:
Surface Electromyography and Inertial Motion Sensing-based Text Entry in AR

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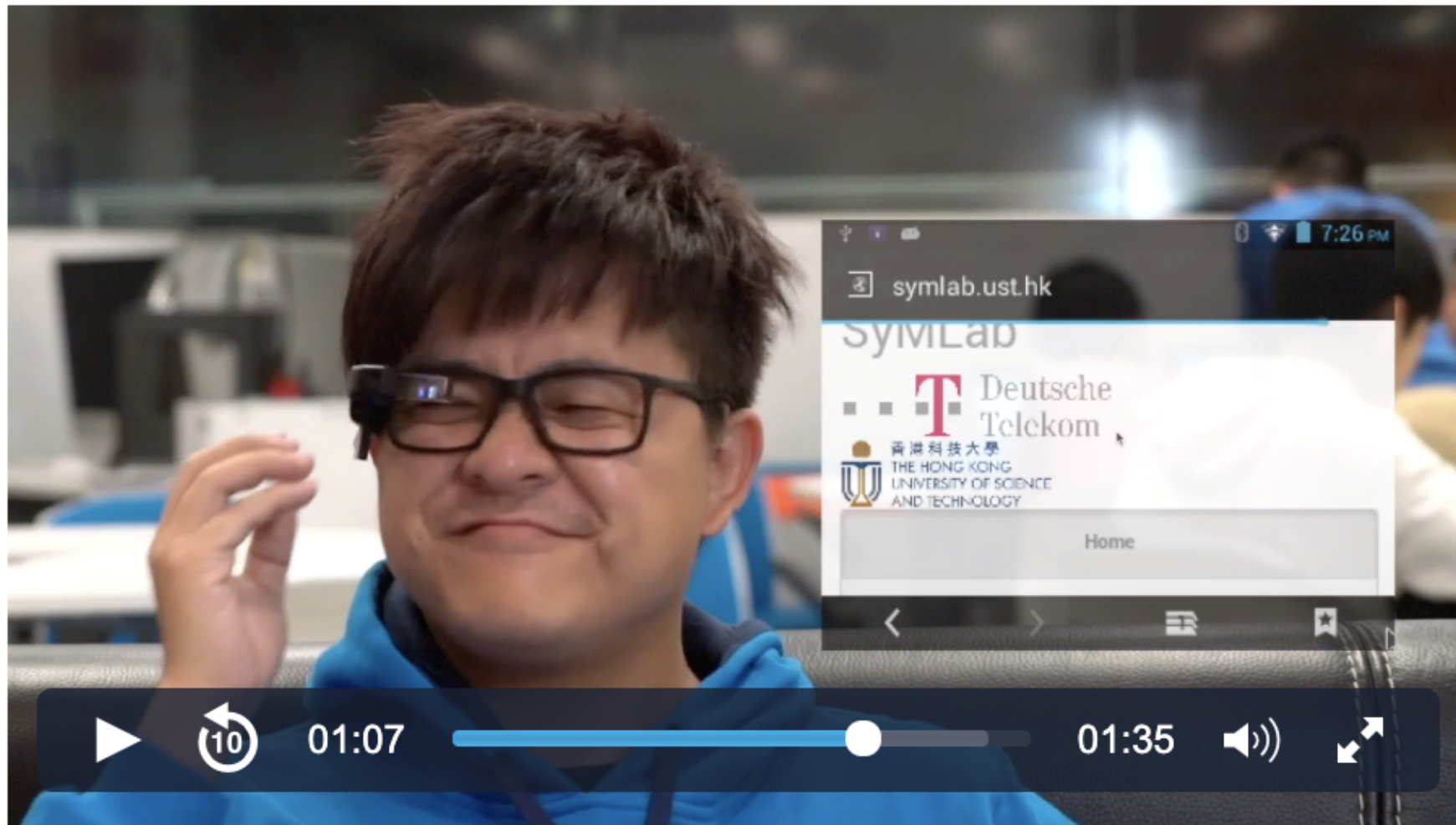http://www.youngkwon.org/papers/articles/kwon_myokey_percom20.pdf

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AND TECHNOLOGY

Seamless Interaction is Essential

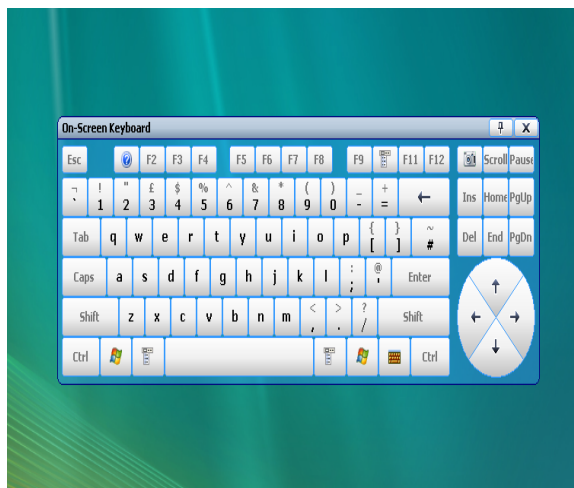Video URL: https://ieeexplore.ieee.org/document/8368051

Prior Works & Limitations

Speech
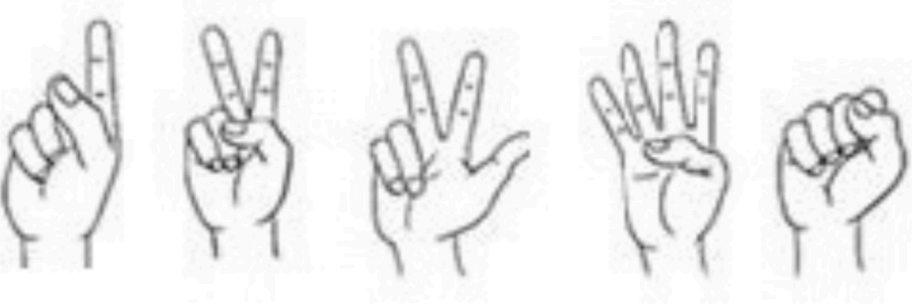

Big Screen

Vision

Freehand & Mid Air Interaction

MyoKey for Natural Text Input

- **MyoKey** is a system that enables users to naturally input words by leveraging the surface Electromyogram (sEMG) and Inertial measurement unit (IMU) while minimizing the screen real estate in AR

- EMG = electrical activity caused by muscle contraction used for **Gesture Recognition**

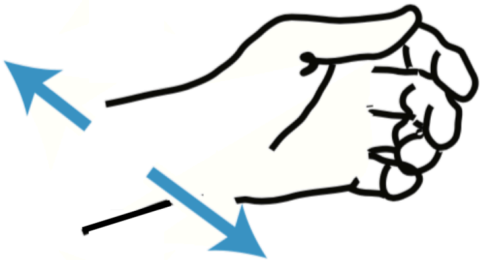- IMU = track **Motion** and **Orientation** of the user's arm
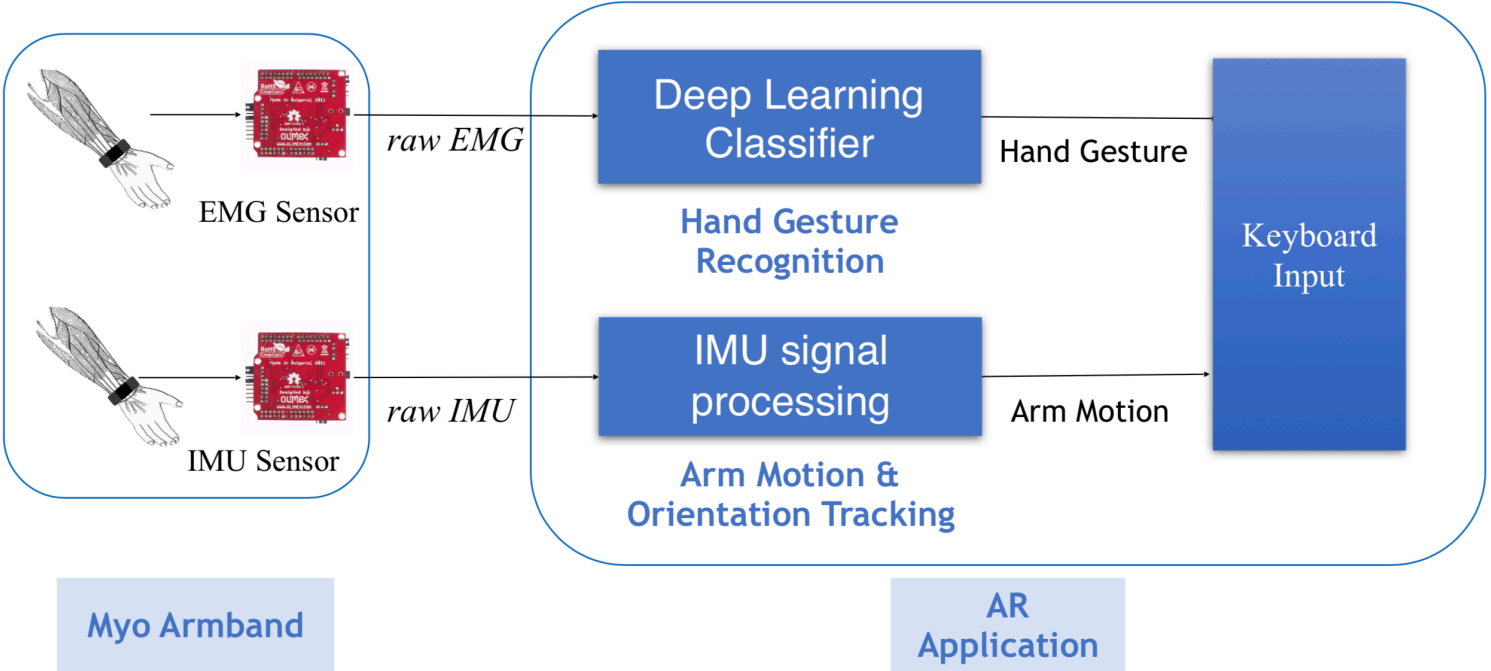
Design Overview

Interaction Design

(a) Five Gestures

(b) Left and Right Motion

System Design

raw EMG

EMG Sensor

raw IMU

IMU Sensor

Deep Learning Classifier

Hand Gesture Recognition

IMU signal processing

Arm Motion & Orientation Tracking

Hand Gesture

Arm Motion

Keyboard Input

Myo Armband

AR Application
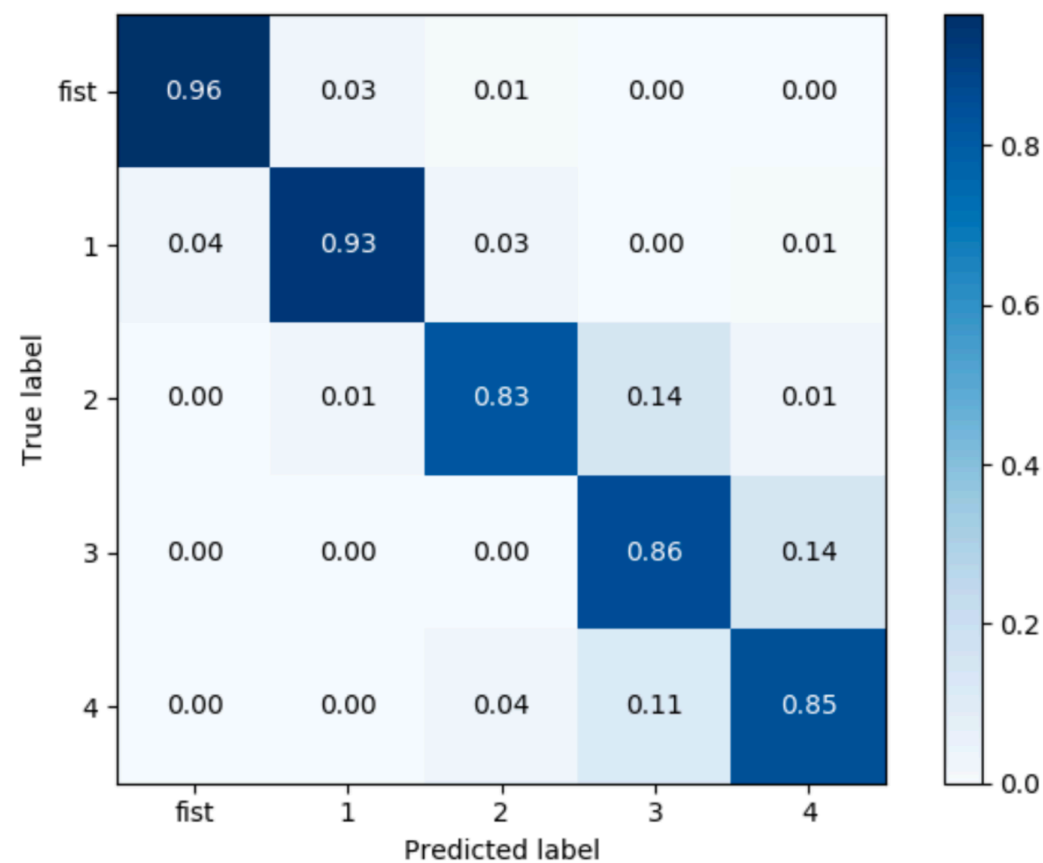
Evaluation

- 5 subjects

- 3 sessions for each gesture (session length: 30s)

- sEMG sampling rate: 200 Hz

- Employed Model: CNN

Confusion matrix for per-subject gesture experiment

Conclusion & Future Work

- **Novel Approach** to input characters in AR using sEMG & IMU

- **Promising results** to demonstrate the **applicability of MyoKey**

We will conduct

- **Comprehensive user study** to evaluate **practicality of MyoKey** (e.g., input speed, error rate, perceived task load, comparison over time)

Thank you!

Any questions?

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http://www.youngkwon.org/

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