

Calibration of Head-Mounted Finger Tracking to Optical See-Through Head Mounted Display

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Motivation

- Missing Calibration between **Finger Tracking** & Optical See Through **HMD**
- Challenge: Optical-See-Through → No tracking possible (no camera)
- Easy to use calibration for daily life is required

Proposed Solution: HMD calibration with finger tracking

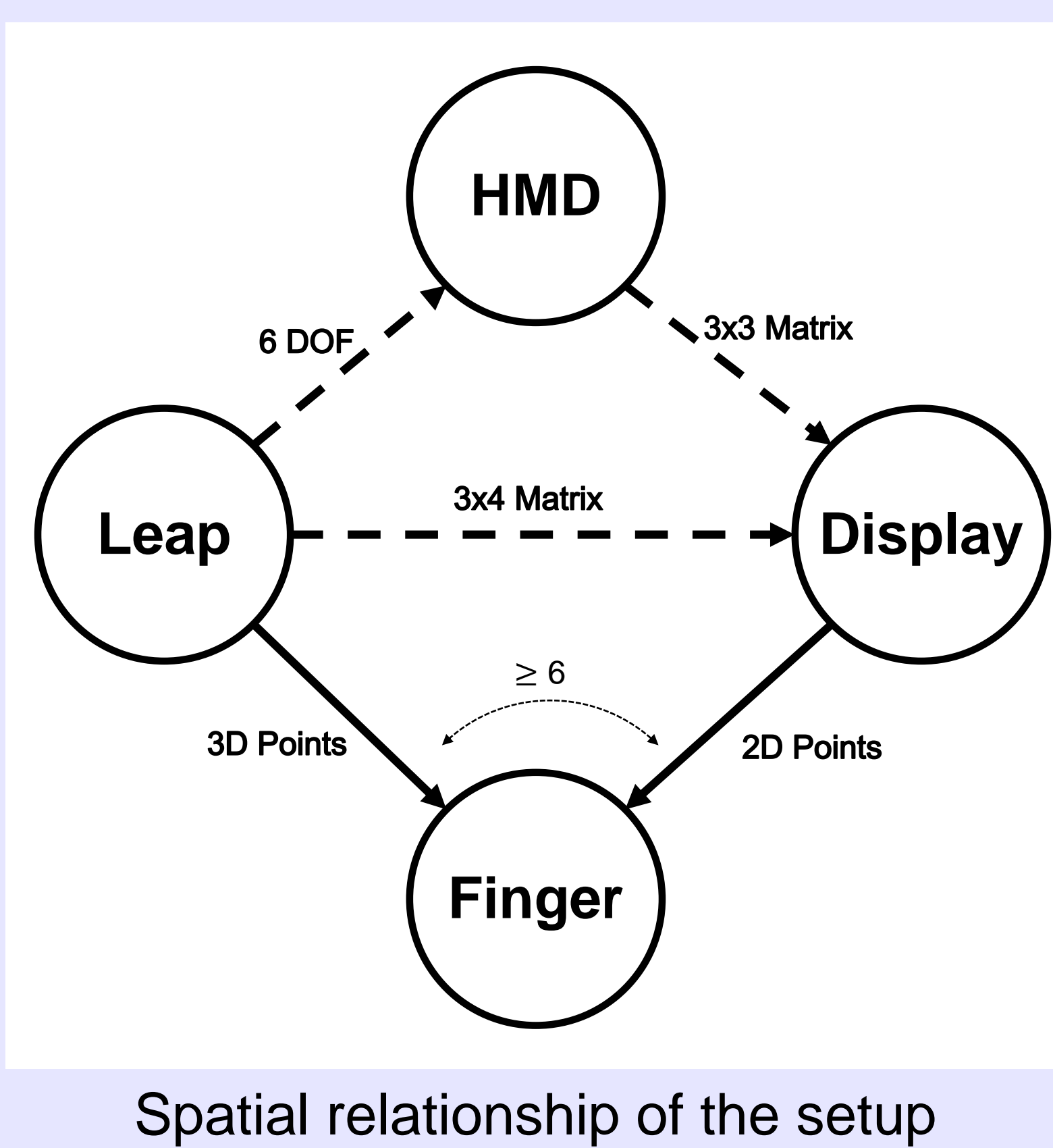
Setup Description

- Hardware



- Software

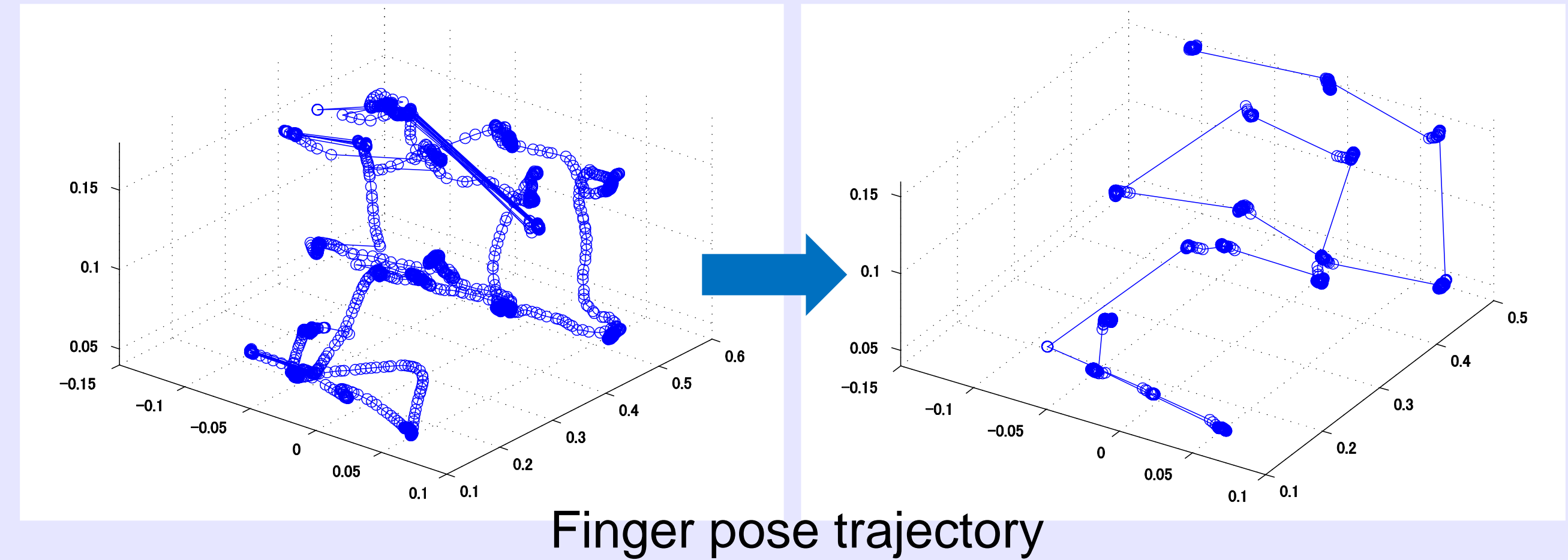
- Unity
- Ubitrack [2]



Algorithm Description

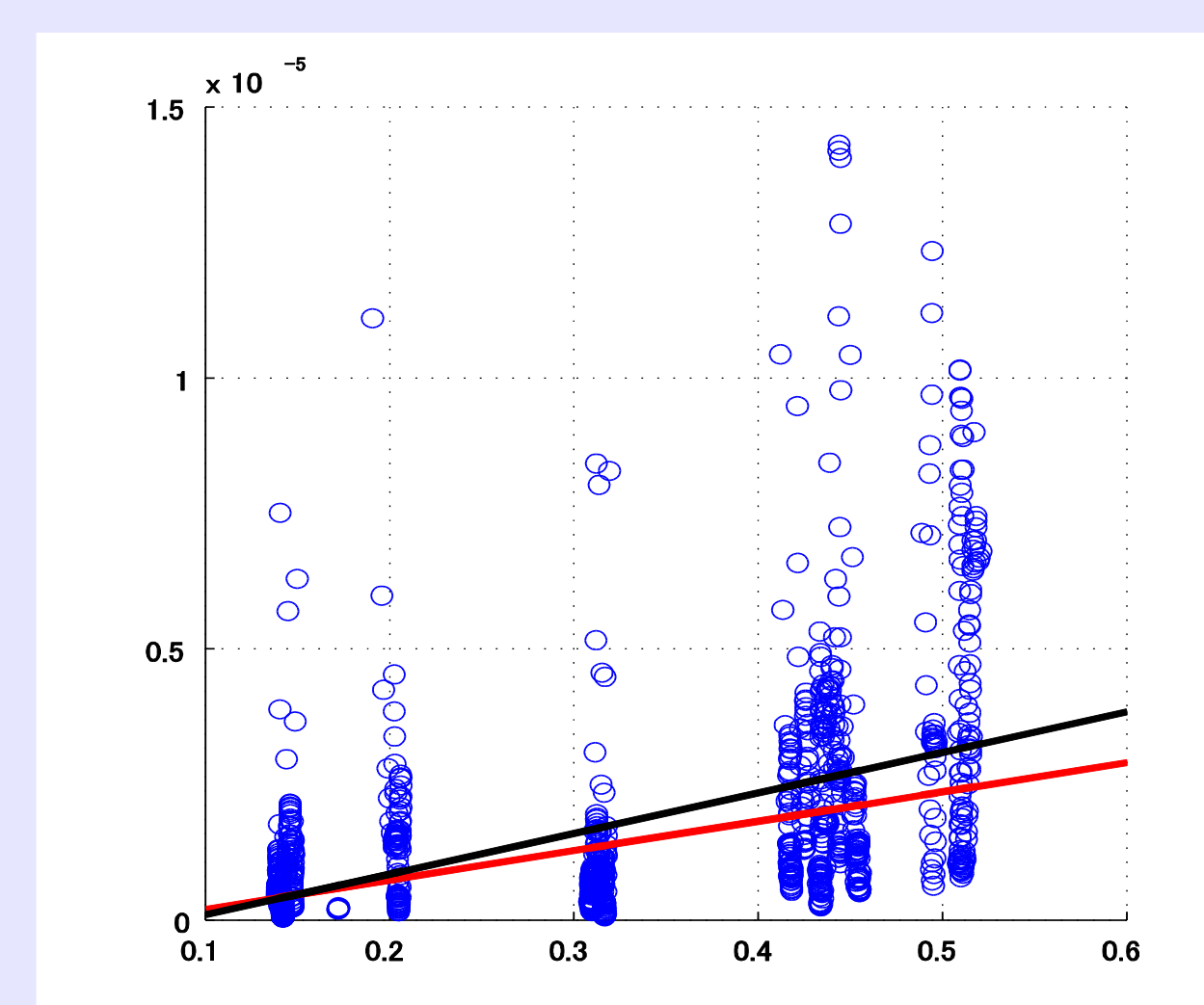
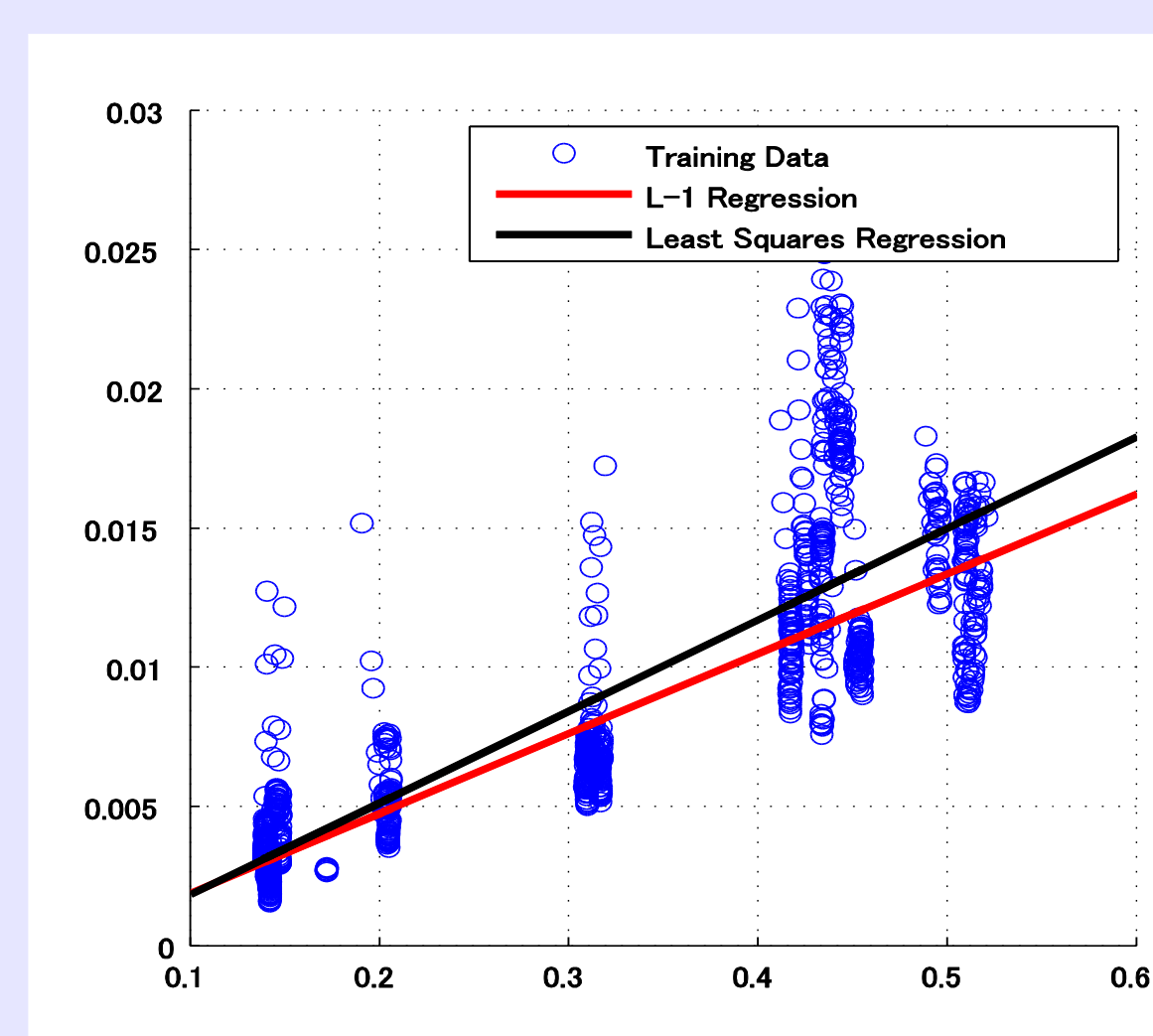
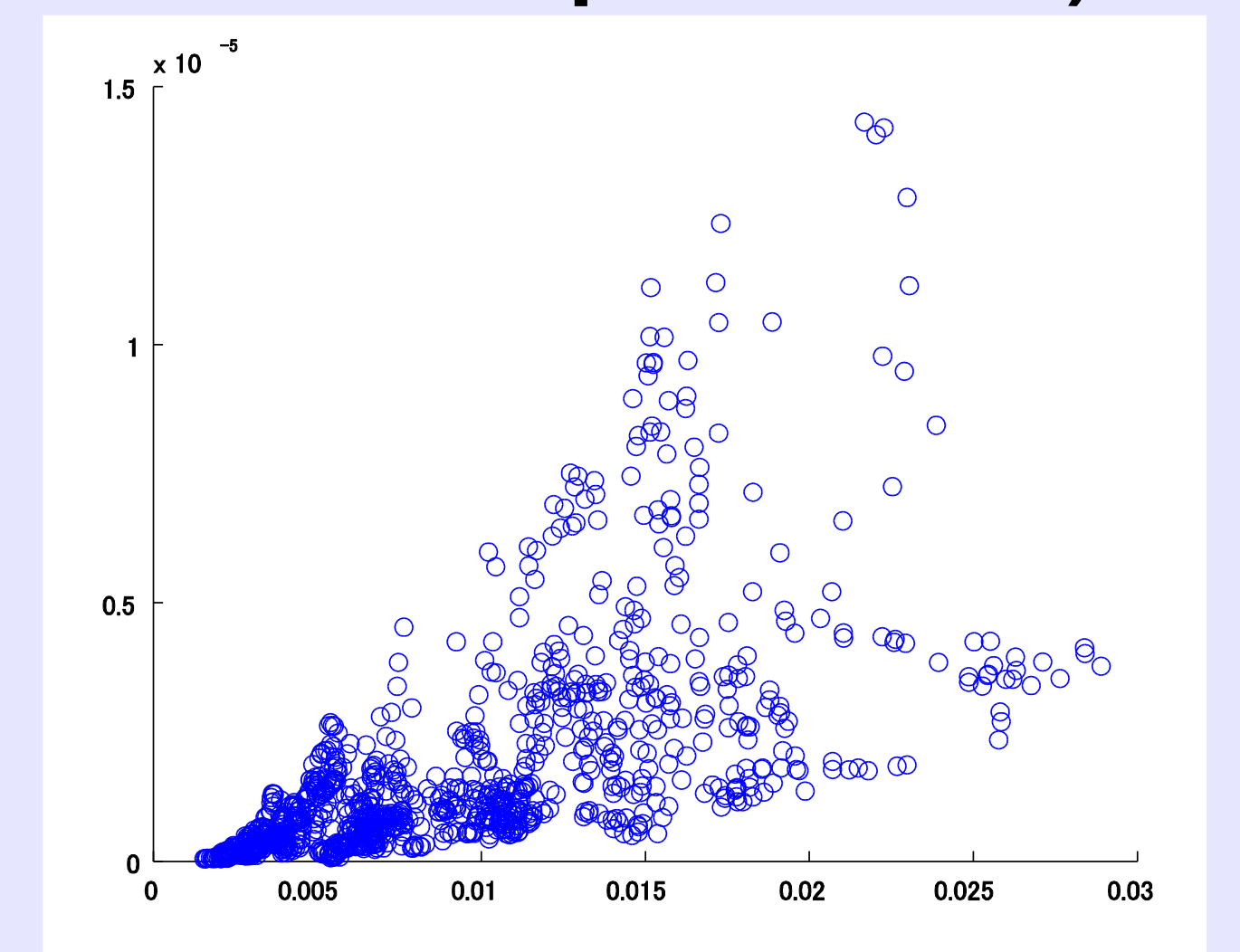
1. Sample acquisition

- Preprocessing
- Time sliding window



2. Confirmation by waiting method [1]

- Extract features (given finger position sequences)
 - a. Variance
 - b. Total Variation (TV)
- Thresholds by L1 regression along finger distance (Offline)



3. Parameter Estimation
SPAAM-like optimization

(Single point active alignment method)

Possible Applications

- Augmented Reality
- Autonomous Calibration
- Natural 3D User Interface

References

- [1] M. Huber, D. Pustka, P. Keitler, F. Ehtler, and G. Klinker, A system architecture for ubiquitous tracking environments, ISMAR '07
- [2] P. Maier, A. Dey, C. A. L. Waechter, C. Sandor, M. Tonnis, and G. Klinker, An empiric evaluation of confirmation methods for optical see-through head-mounted display calibration, JVRC'12