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
  - Sony Glasstron PLM-S700
  - Leap Motion
- 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