EYECONTROL

Contour-Guided Gaze Gestures: Eye-based Interaction with Everyday Objects and IoT Devices

Institute for Pervasive Computing

JYU
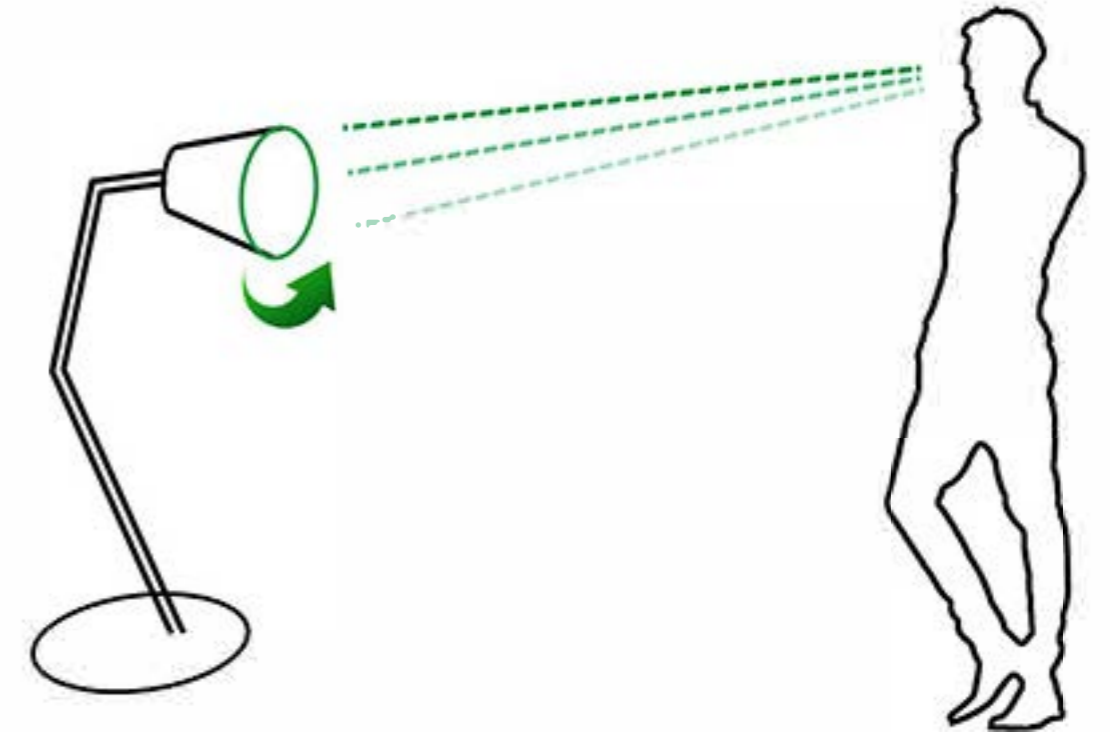**JOHANNES KEPLER UNIVERSITY LINZ**

WHY GAZE-INTERACTION?

- Internet of Things enables new forms of interactions
- Humans tend to gaze at objects before interacting
- Implicit indicator for attention
- Fast & effortless
- Hands free & remote access

- Issues for eye-based interaction
  - "Midas Touch" Problem
  - Calibration
  - Visual stimulus for controlled eye movements

"Our eyes are not able to perform controlled smooth curves if not guided by a visual stimulus"

Jacob. R., & Stellmach, S. (2016). What you look at is what you get: gaze-based user interfaces. interactions, 23(5), 62-65.

INTERACTION CONCEPT
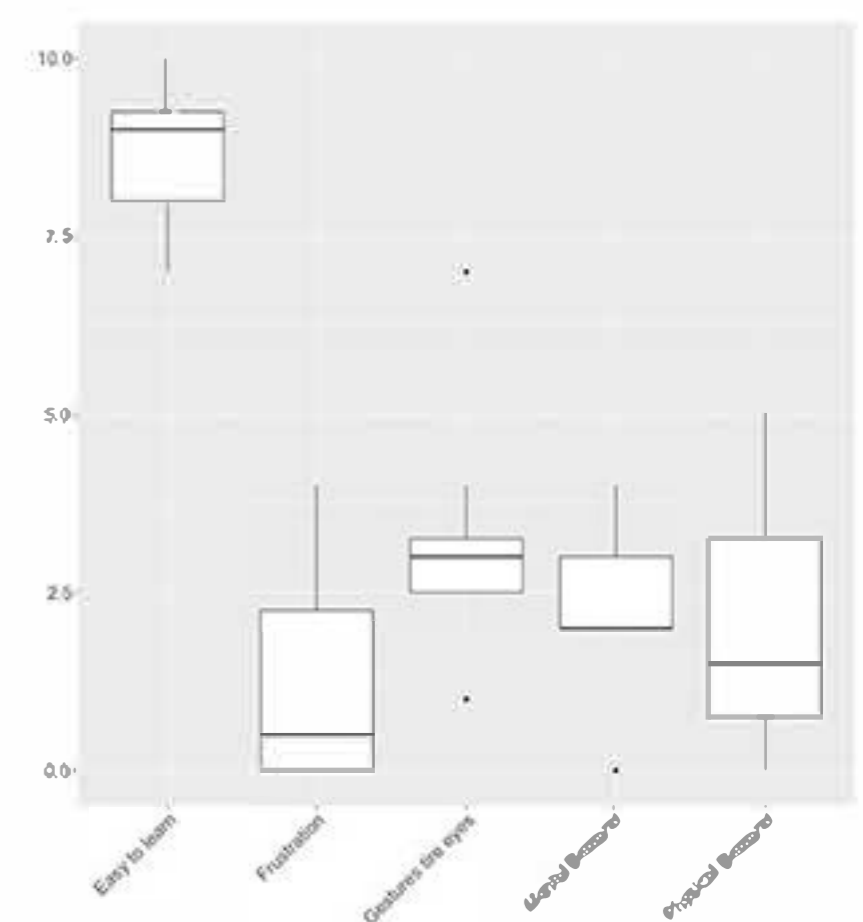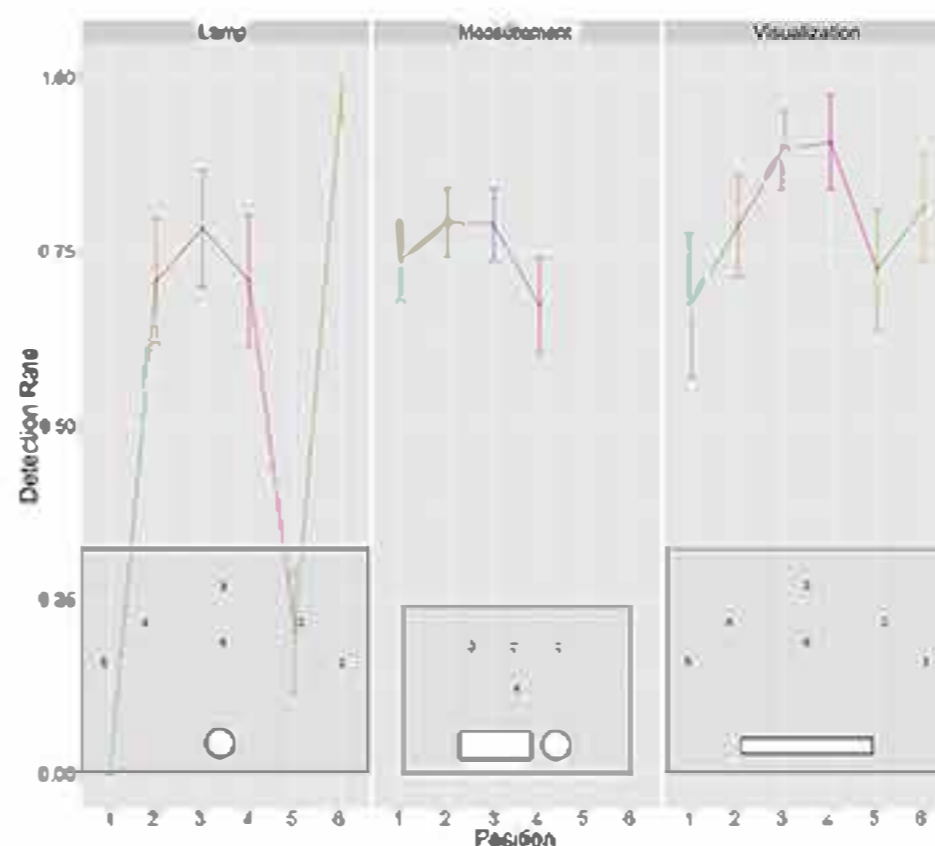
Tracing of object contours triggers interaction:

- **No annotation:** Object contour acts as visual guidance
- **No calibration:** Relative eye movements
- **No unintended activations:** Unnatural gaze behaviour

SYSTEM DESIGN

Eye Movement Analysis: Path Correlation

Scene Analysis: Shape Detection
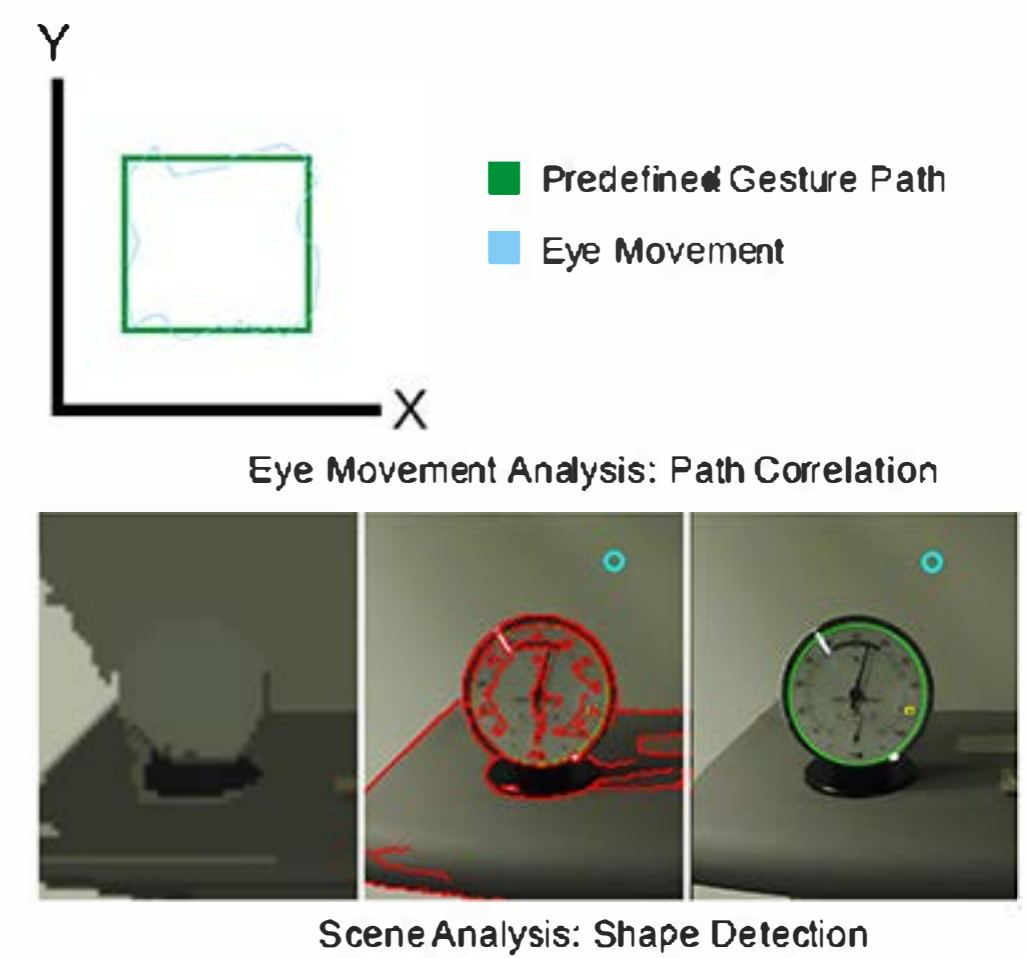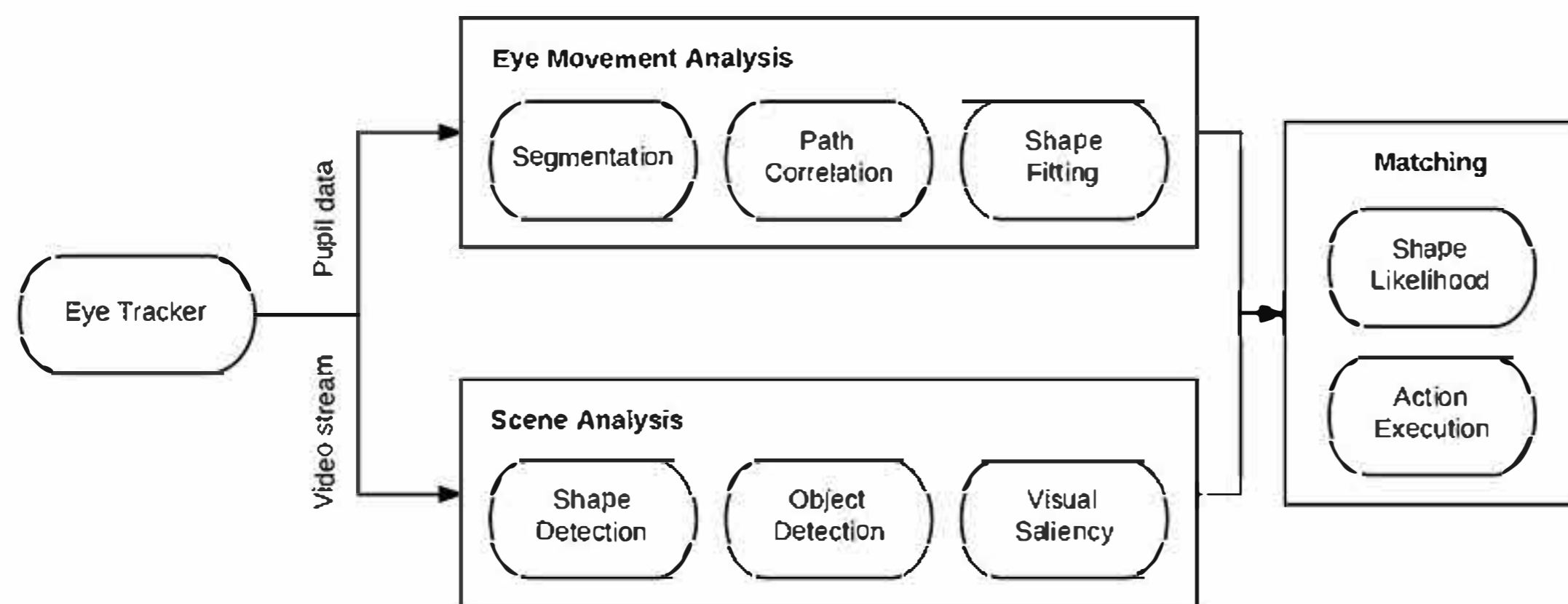
EARLY RESULTS

- 8 Participants (5M/3F)
  - 256 Gesture Executions
  - 128 Gesture Avoidances

- Detection Rate: **0.70**
  - Lamp: 0.56
  - Visualization: 0.79
  - Measurement: 0.74
- False Positive Rate: **0.05**

ACKNOWLEDGEMENTS

Contact
Florian Jungwirth, Michael Haslgrübler, Alois Ferscha
Institute for Pervasive Computing
Johannes Kepler University, Linz, Austria
{jungwirth,haslgruebler,ferscha}@pervasive.jku.at

Institute for
Pervasive Computing
Technology for People