



iControl



Dirk Widmann & Halin Kim
Winter term 19/20 Interaction Engineering
Hochschule Augsburg

I control?

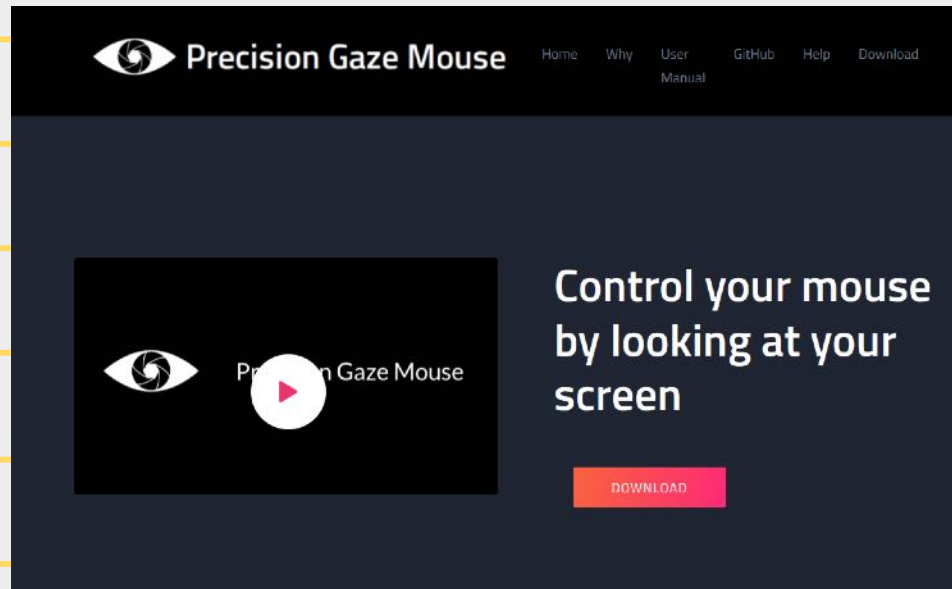
Evaluate if the **eye tracking and gesture** input format could emulate the tasks of a **mouse** when tackling simple interactive tasks

 All mouse users

 Curiosity, Novelty, Creativity

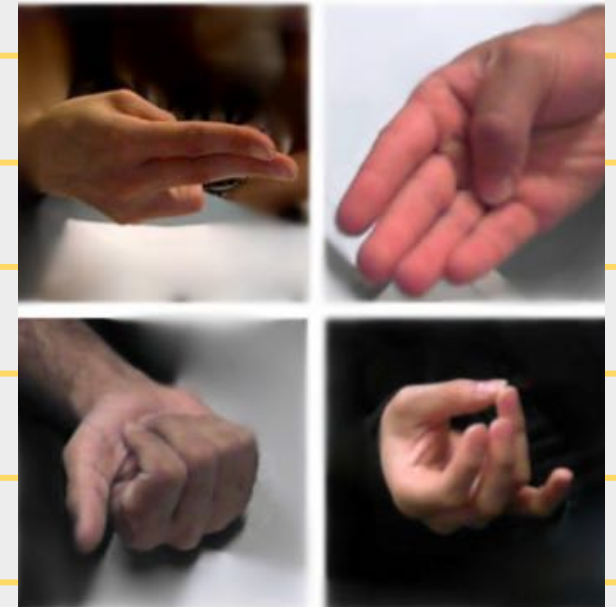
 Comparing Gesture technology to Mouse interface

Related Work



Eye, Head tracking

Single Hand Micro Gesture



Eye tracking + Gesture

Interaction Techniques

Tobii

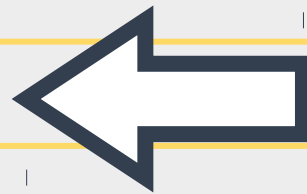
Gaze tracking
Gaze -> Mouse Pointer



Leap motion

Gesture
Gesture -> Mouse Click (Left, Right)
Mouse Wheel

Technical implementation



tobii

LEAP

M O T I O N

Technical implementation

LEAP
MOTION



Continuous 3D coordinate data of finger tips

Comparing the position of each finger tip to average

tobii

Continuous 2D coordinate position data of gaze

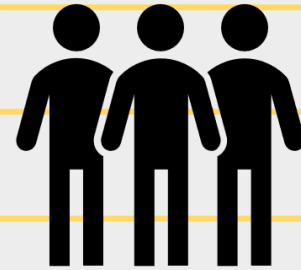
Filtering of gaze position to reduce shaky movement noise



User tests



Participants



3 Male



4 Female

Students between 22 and 26

No experience with eye tracking

User test : Interaction Techniques

Task I



Drag the yellow square into the grey area!

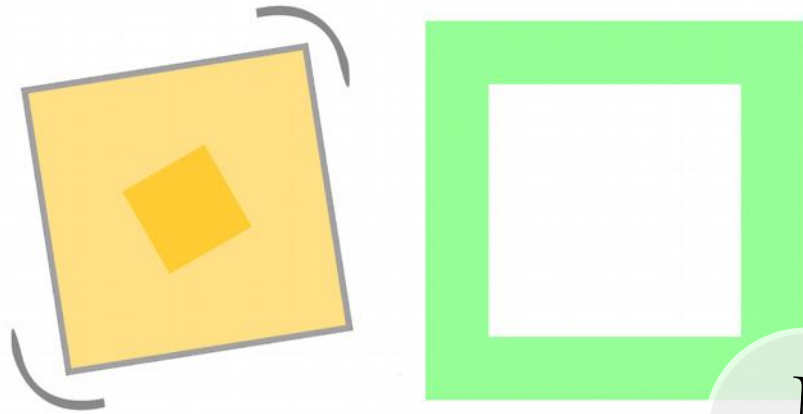
Mouse Implementation

Move Mouse while holding left button

Gesture Implementation

Moving with gaze while trigger-hand is vertical

User test : Interaction Techniques



Now scale and rotate the Square to fit between the two target squares!

Task 2

Mouse Implementation

Move Mouse while holding right button
Scrolling with the mouse wheel

Gesture Implementation

Rotating hand while looking at object
Distance between hand and table while
looking at object

User test : Interaction Techniques



Dragging an object



Rotating an object



Scaling an object

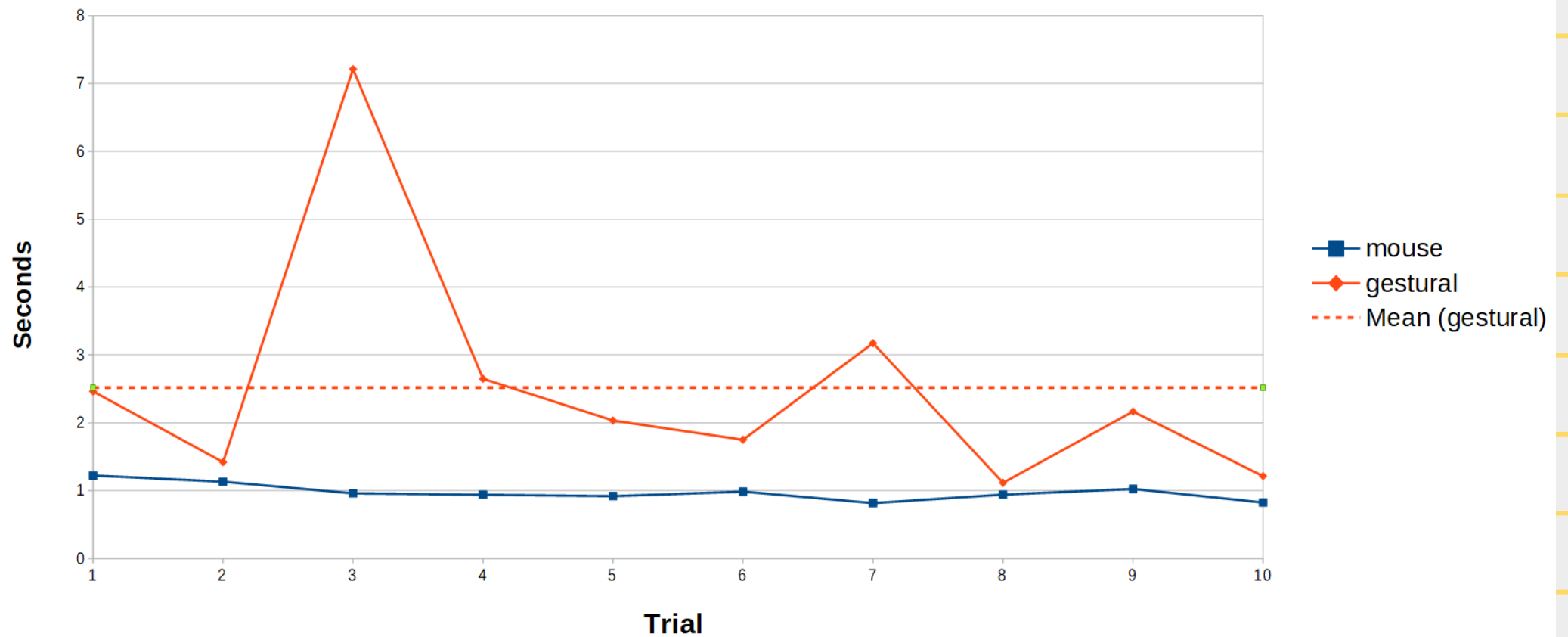
Functions while looking at object

Demonstration



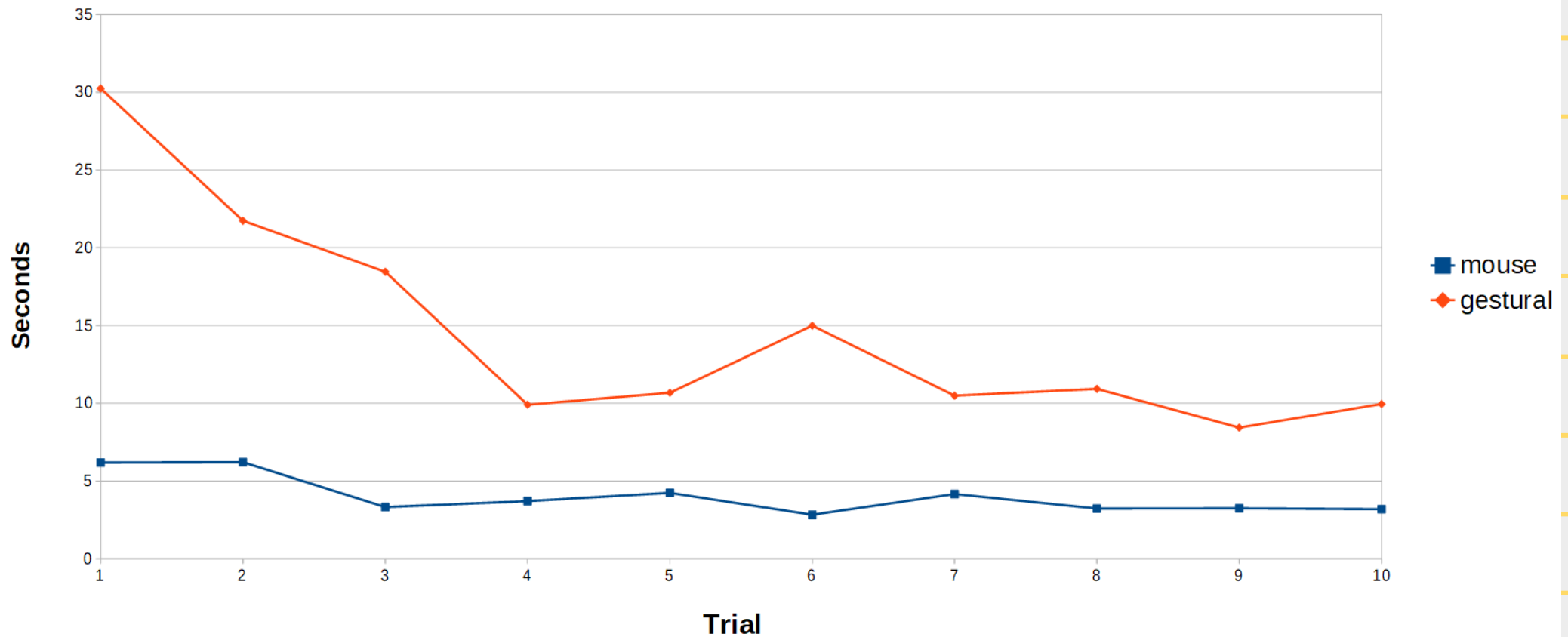
Evaluation

Task 1 interface comparison



Evaluation

Task 2 interface Comparison



Evaluation



Mouse > I control

Fatigue, Elaboration,
Efficiency, Speed

Mouse < I control

Funny, New idea, Easy
Big monitor, Dirty space, Factory



When it is well developed? “YES”

Thank you

