

Multitouch surface based on RGBD camera

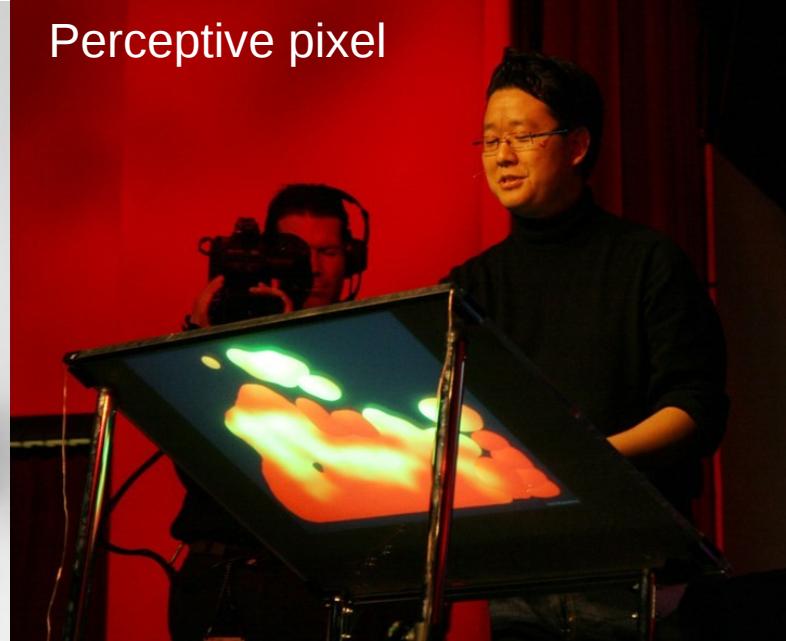


Klemen Istenič, Luka Čehovin, Danijel Skočaj

Samsung SUR40



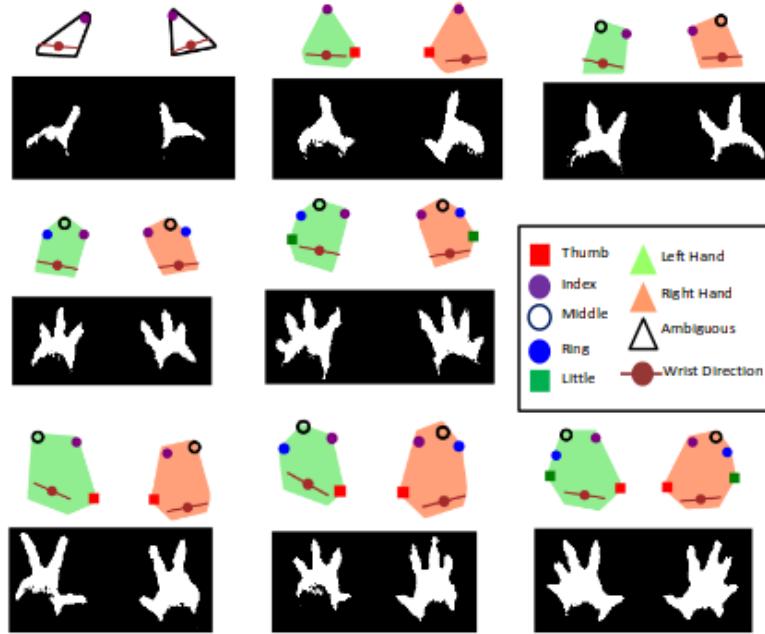
Perceptive pixel



LGM Fingerscape

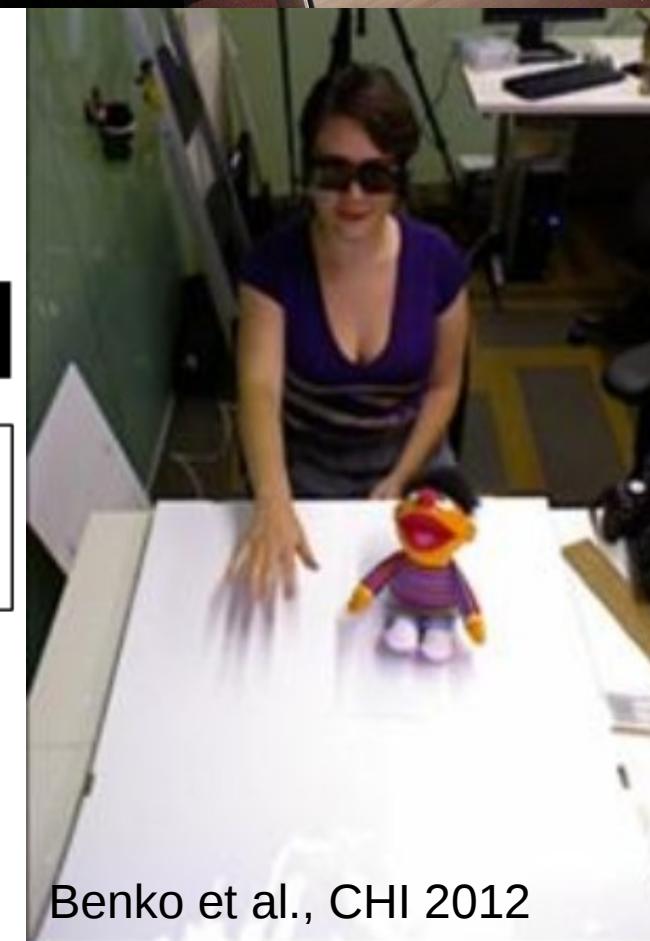


Related work



Wilson, ITS 2010

Murugappan et al., ITS 2012



Benko et al., CHI 2012

Goals

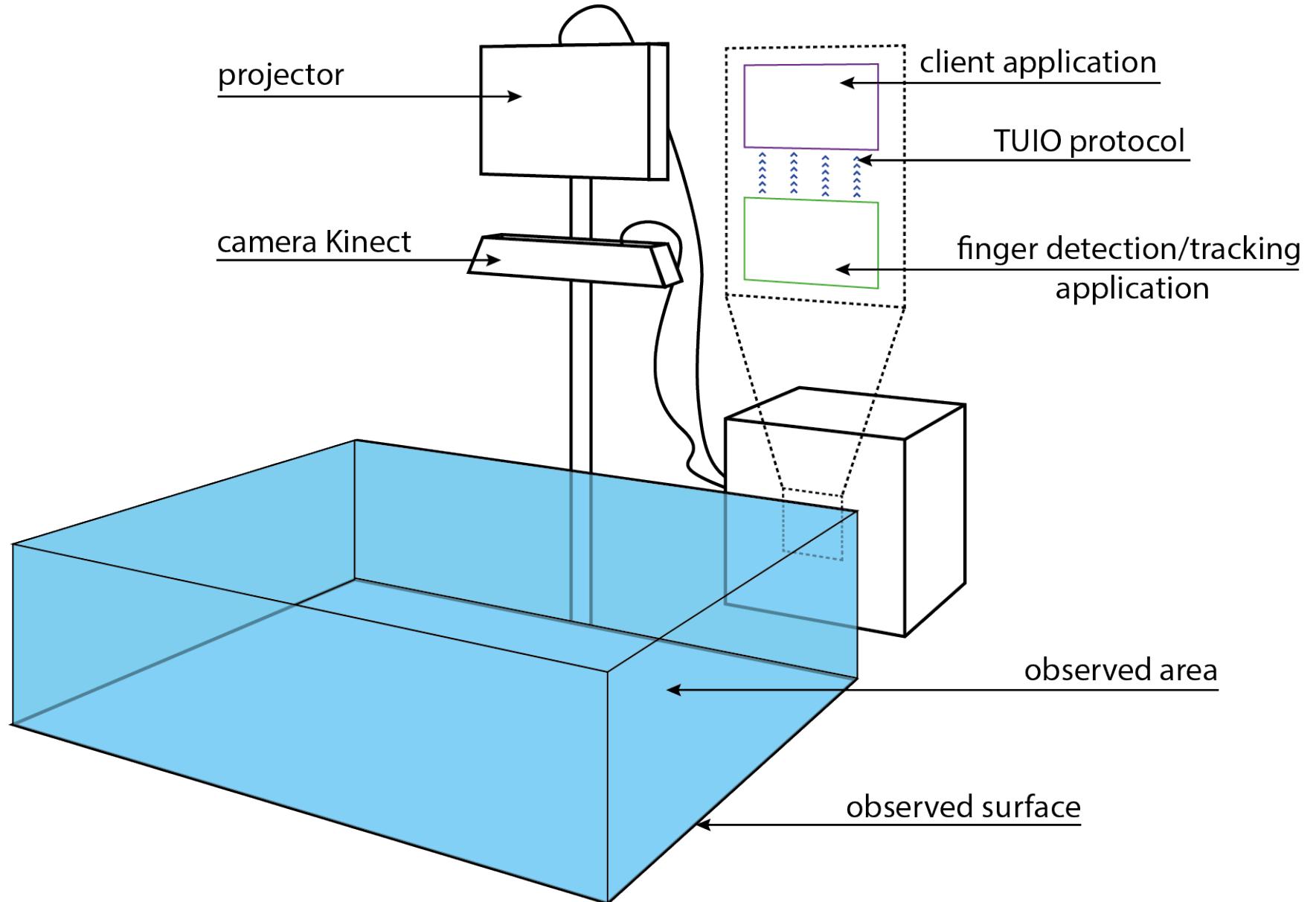
2D and 3D interaction

Easy deployment and configuration

Low cost

Hardware independent

Open-source technology



Software used: Ubuntu Linux, Freenect, OpenCV, PCL, Eigen

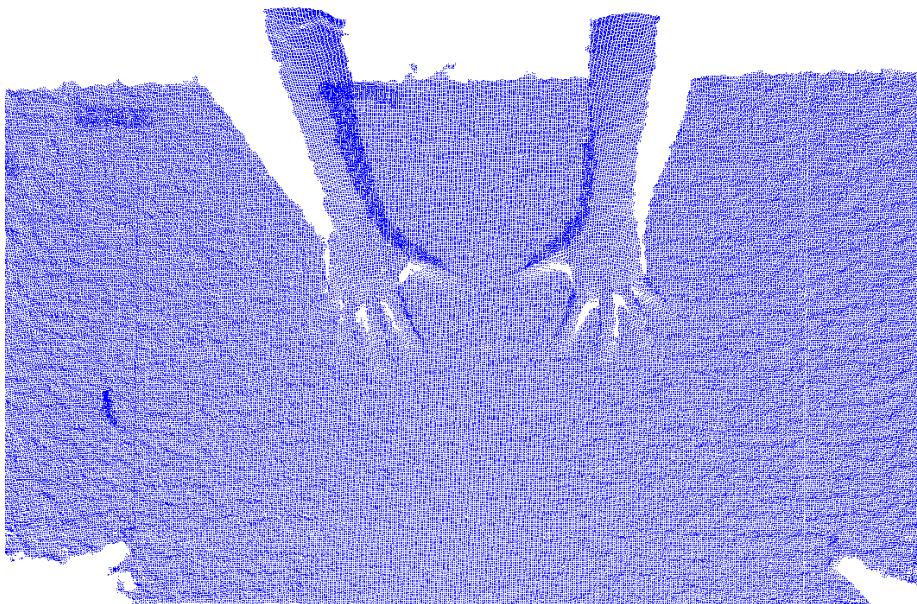
Processing software

Background model

Initialization period

Estimating surface plane (RANSAC)

Adaptive thresholding (Gaussian model)

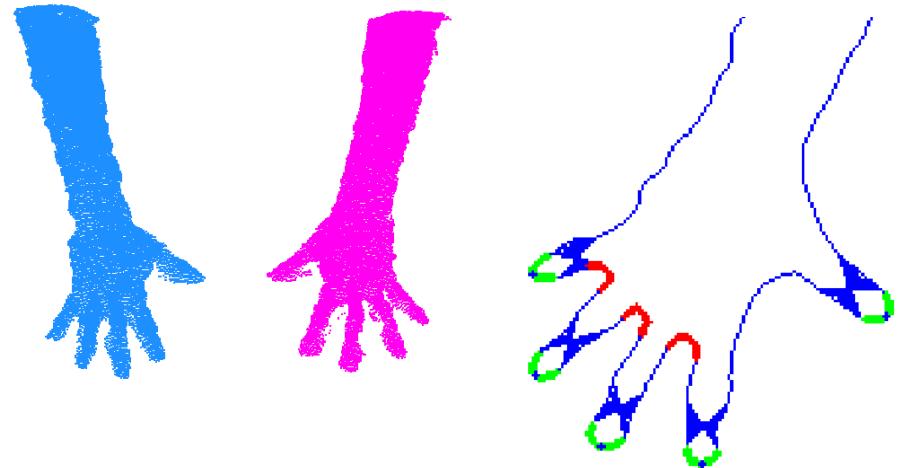


Finger detection and tracking

Connected components

Contour analysis

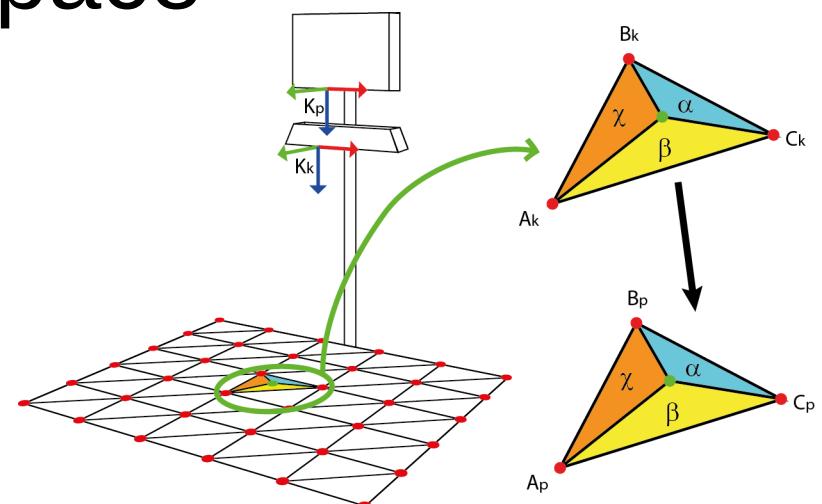
Kalman filter



Transformation to screen space

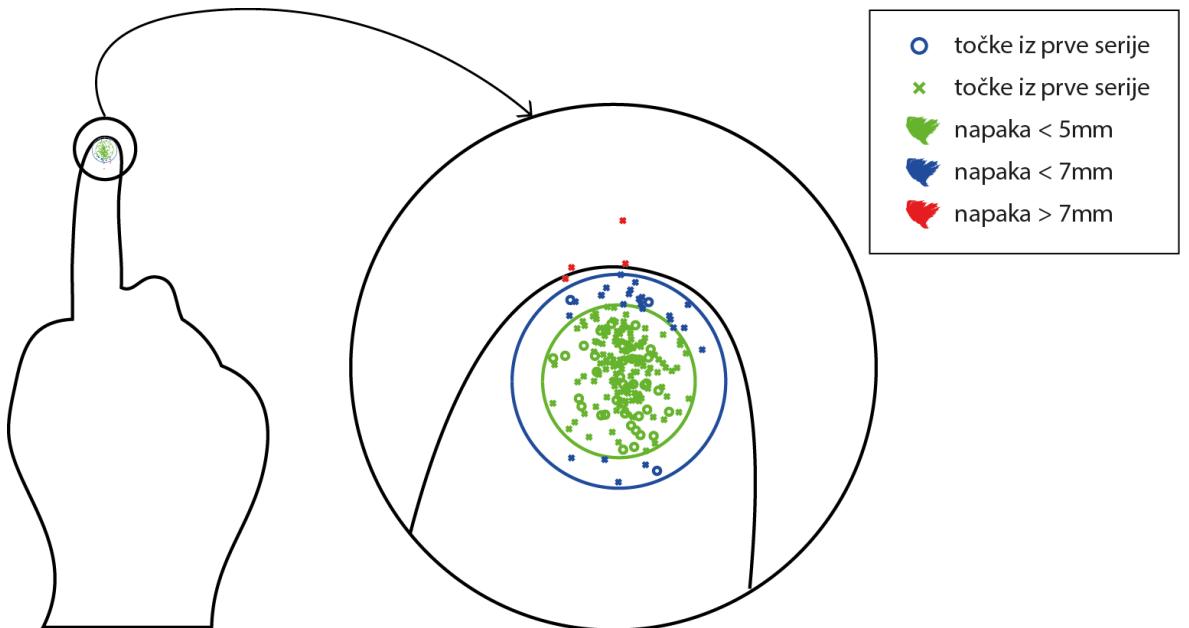
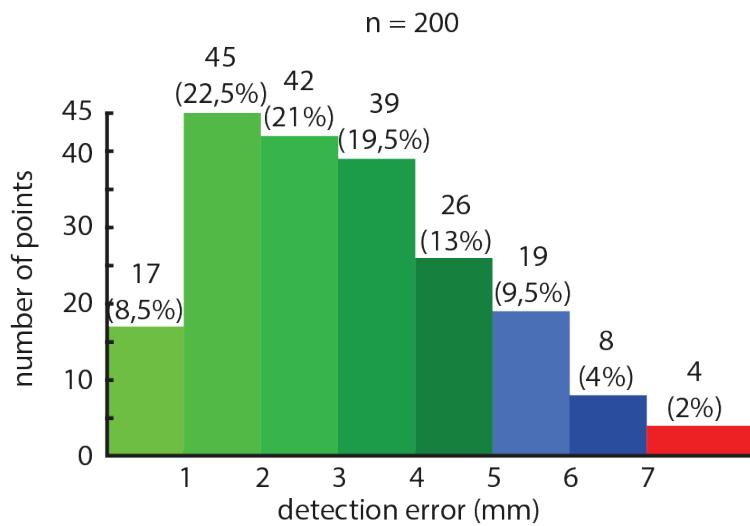
Barycentric coordinates

Manual calibration



Evaluation

Accuracy



Responsiveness

120 – 125 ms

Processing: 8 ms

Display: 1 ms

User experience

Only 2D applications available
TUIO protocol

Microsoft Touch Pack for Windows 7
TUIO-compatible applications

Limitations

- Hardware
 - Latency
 - IR light, surface type
 - Surface size
- Software
 - No 3D applications
 - Manual calibration

Future work

Utilizing 3D input
Speed, robustness
Better hardware
Automatic calibration
HTML5 applications

