

GESTURE-BASED USER AUTHENTICATION FOR MOBILE DEVICES

Dennis Guse

Quality and Usability Labs, TU Berlin



AUTHENTICATION ON MOBILE DEVICES

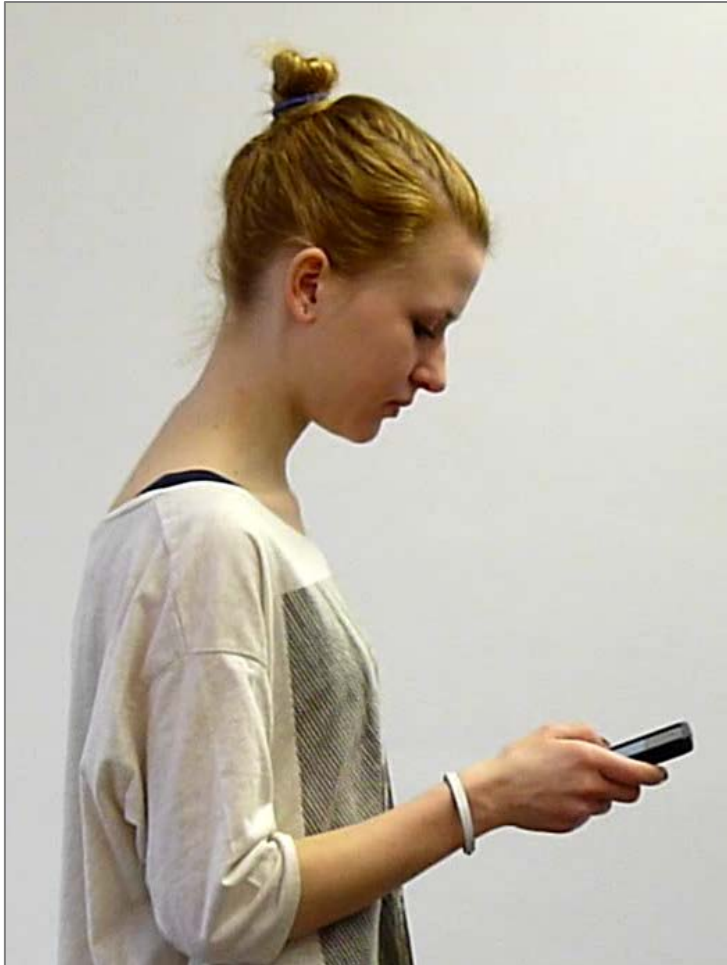


Mobile Devices

- Interaction style
- Limitations



GESTURE-BASED USER AUTHENTICATION



Personalized gesture

- + Natural input
- + Memorization



DEMO





IMPLEMENTATION

Motion Sensors

- 3D-Accelerometer
- 3D-Gyroscope

Manual segmentation

- Push-to-gesture-button

Length Constraint

Algorithms

- Hidden Markov Models
- Dynamic-Time-Warping





EVALUATION

1. Feasibility

Proof-of-Concept-Study

2. Usability

3. Potential Attacks

Forgery-Study



Tools

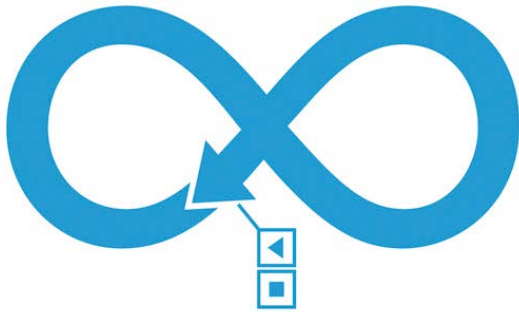
Gesture Recorder

Questionnaires

Designed Gestures



TOOLS: DESIGNED GESTURE



Description:

Move the device starting in direction of the arrow in parallel to your upper torso. Start and finish the gesture at the position of the play- and stop-symbol.





USER STUDIES

Proof-of-Concept-Study



15 Participants

- 5 Enrollment
- 15 for validation

Forgery-Study



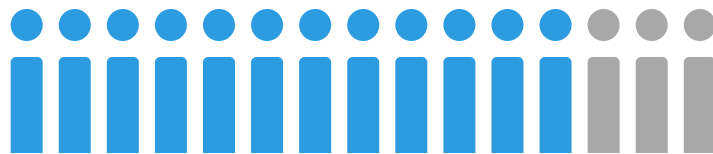
10 Participants

- 12 attacked interpretations
- 100 forgeries per interpretation



RESULTS (I)

User Acceptance



+ 12/ 15 easily memorable



+ 15/ 15 not exhausting



+ 13/ 15 would use it in public



- 7/15 easily forgeable

- Less secure than passwords



RESULTS (II)

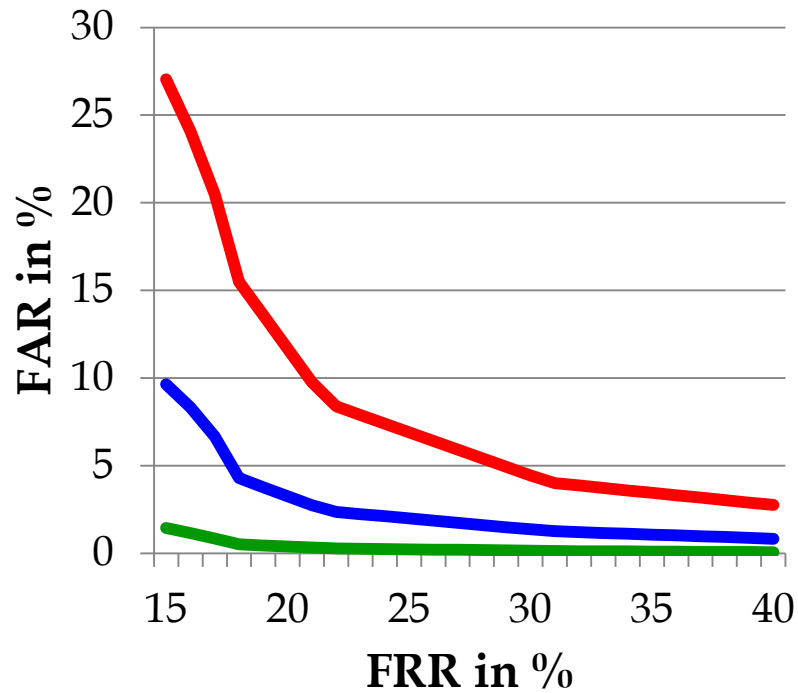
Forger Perception

- Gestures perceived as not complicated
- Easily learnable
- Easily forgeable



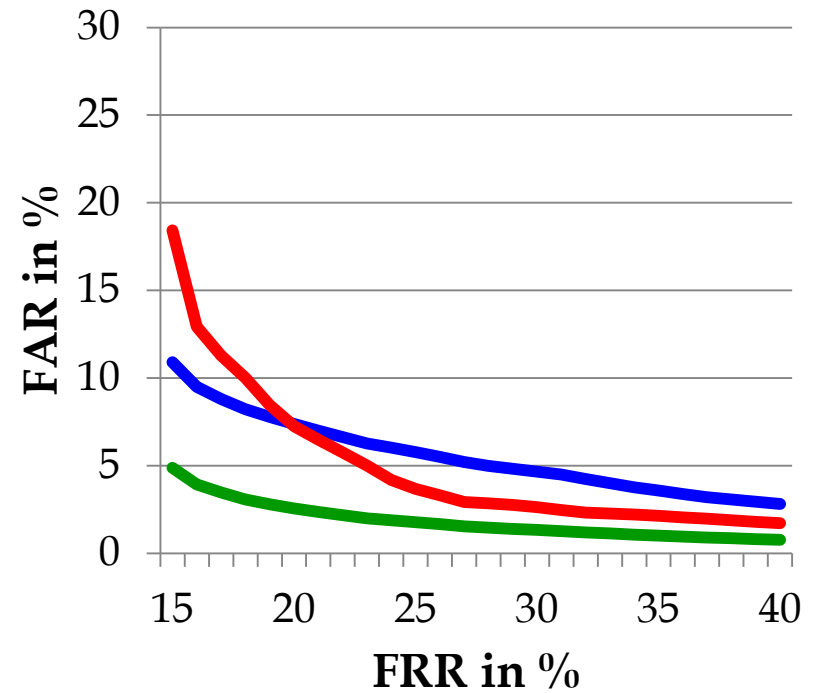
RESULTS (III)

DTW



— Naïve — Semi-naïve — Visual

HMM



— Naïve — Semi-naïve — Visual



THANK YOU FOR YOUR ATTENTION

Future Work

- Study usability in daily life
- Study feasibility in daily life
- Study user acceptance
- Study user perception
- Study resistance
- Refine algorithms



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