

Implicit One-handed Mobile User Authentication by Induced Thumb Biometrics on Touch-screen Handheld Devices

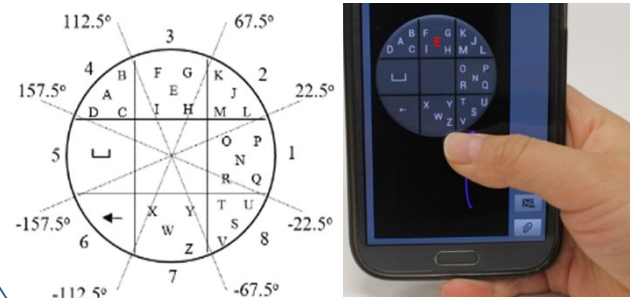
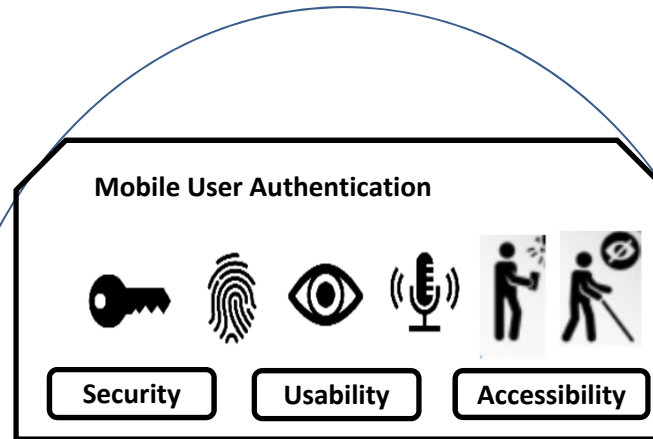


Challenges:

- Most mobile user authentication (MUA) methods face a tradeoff between security and usability.
- Mobile users often interact with devices with one hand, even when both hands are available.
- One-handed MUA faces the challenges of thumb mobility and low accuracy.
- Traditional password-based MUA methods are subject to shoulder-surfing attacks.

Solution:

- Address the security-usability tradeoff by enabling implicit one-handed MUA on touch screen mobile devices.
- Explore induced thumb biometrics to support one-handed point-of-entry and continuous MUA.
- Enable sight-free MUA interaction via the support of keypress-less text entry.



Scientific Impact:

- Provide new design principles for the improvement of one-handed interaction with a mobile device.
- Offer sight-free and keypress-less interactions to improve the accessibility of MUA methods.
- Lay the groundwork for a one-handed MUA method that seamlessly supports both point-of-entry and continuous MUA.
- Introduce a behavioral biometrics method that protects users against shoulder-surfing attacks.

Broader Impact and Broader Participation:

- Improve the accessibility of MUA for users with hand or vision impairments.
- The interdisciplinary nature of this work will promote teaching, training, and education in mobile security and privacy, human-computer interaction, mobile accessibility, machine learning, and behavioral science.
- This project improves the participation and awareness of MUA among a diversified population.
- Three PhD students and four Master's students have been funded through this project. Among them, three are female students.

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