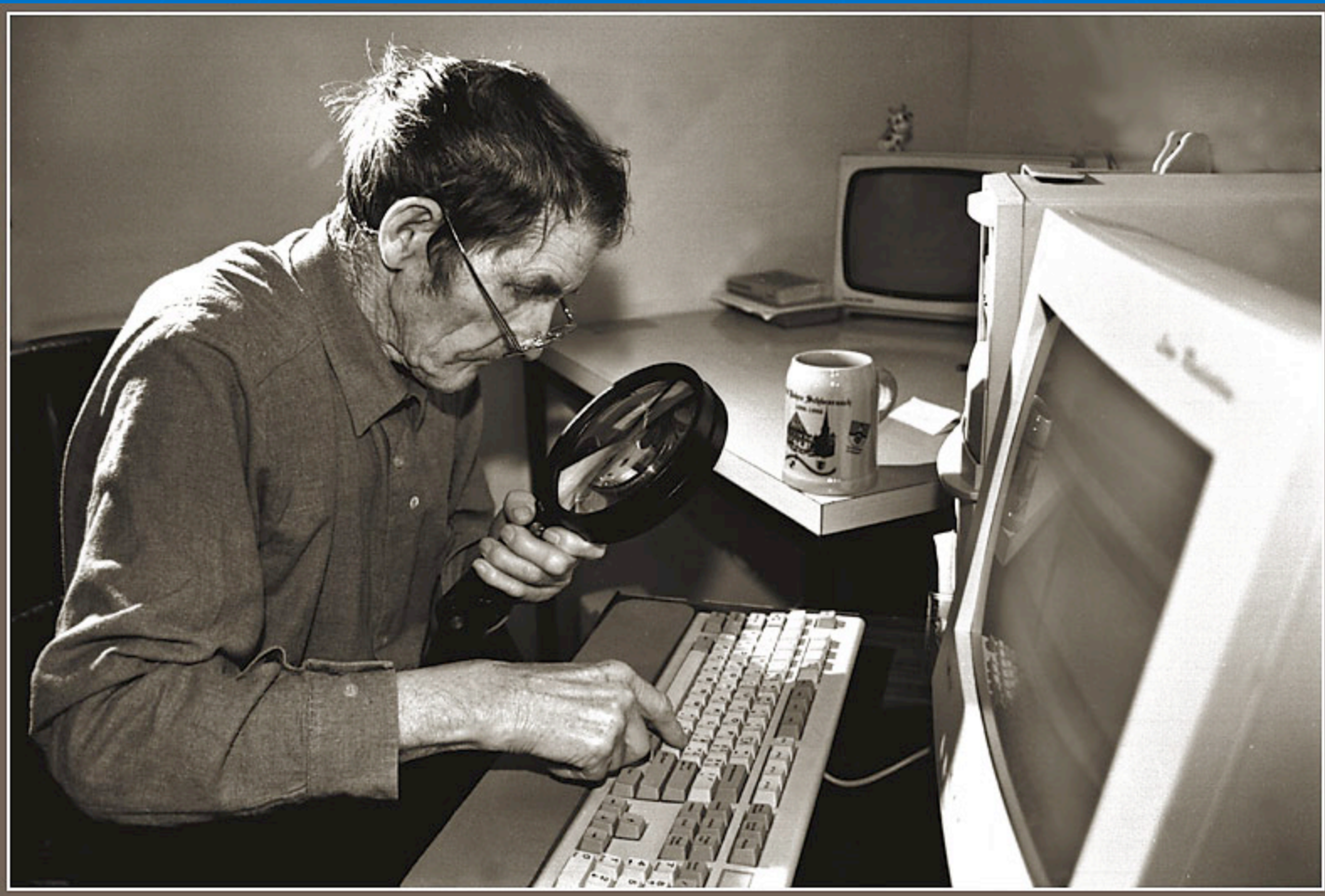


A Novel Approach for Identification and Authentication of Users in a Pervasive Environment

Stavros Garzonis, Eamonn O'Neill,
Vassilis Kostakos, Manasawee
Kaenampornpan, Andy Warr

HCI Group
Department of Computer Science
University of Bath



Overview

- Describe current technology and approach for authentication.
- Problems with applying existing measures to pervasive computing.
- Describe a set of criteria to overcome these problems.
- Describe an approach.

Currently...

- Current systems are based on
 - authenticating devices.
 - remembering passwords.
- Security is focused on technological issues, but other issues exist
 - Social issues (privacy, trust).
 - Interaction issues
 - Usability and security in direct conflict.

Moving into a Pervasive Environment

- Three main problems arise
 - Large number of devices → Interaction burden.
 - Even more passwords to remember → Cognitive load.
 - Uncertain conditions → Security risks
 - Public devices, invisible devices.

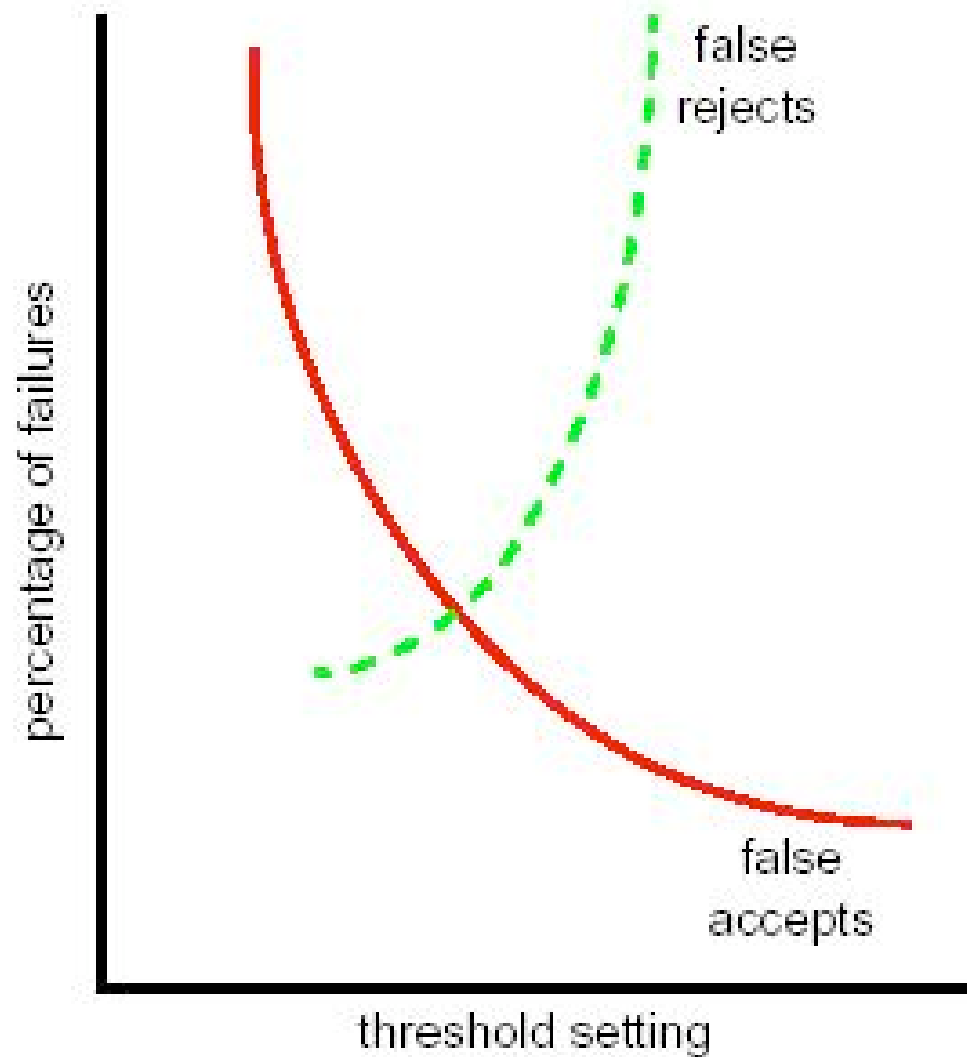
What we need is...

- An approach that
 - Addresses usability
 - Reduces cognitive load.
 - Reduces explicit input.
 - Addresses security
 - Identify people, not devices.
- Main approaches to identification are
 - Something you know.
 - Something you have.
 - Something you are.

Biometrics

BIOMETRIC	FINGERPRINT	FACE	HAND GEOMETRY	IRIS	VOICE
					
Barriers to universality	Worn ridges; hand or finger impairment	None	Hand impairment	Visual impairment	Speech impairment
Distinctiveness	High	Low	Medium	High	Low
Permanence	High	Medium	Medium	High	Low
Collectibility	Medium	High	High	Medium	Medium
Performance	High	Low	Medium	High	Low
Acceptability	Medium	High	Medium	Low	High
Potential for circumvention	Low	High	Medium	Low	High

Biometrics



The Human Network

■ Main idea

- Place embedded biometrics where natural physical interaction occurs.
- Have constant user recognition.
- Extend the network protocol (IPv6 headers) to include user information.
- Devices now play the role of routers and bridges; the user is the final node.



Figure 15: Examples of fingertip scanning applications

What would be achieved?

- Load on memory is reduced.
- Load on interaction is reduced.
- People are being tracked.
- Efficiency of biometrics is increased.
- Various biometric methods can be used, according to modality
 - Fingerprint, face, iris, voice.

In Summary

- Security and usability don't have to contradict each other
 - Embedded biometrics sensors, and extending the network protocol can reduce this inverse relationship.
- Tracking people, not devices, can enhance security.
 - Not meant as the sole security measure.

The end Thank you

Vassilis Kostakos
HCI Group
Department of Computer Science

