



Pervasive ICT and Applications Alleviating the Cognitive Decline

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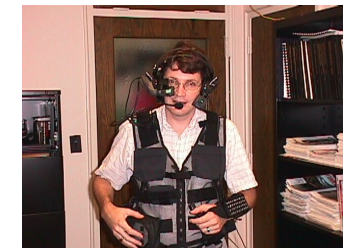
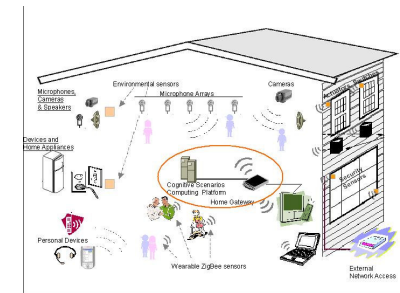


Overview

- Pervasive Computing and Ageing Well
- Prominent Application and Challenges
- Emerging Interfaces
- Some Recent Representative (EU) Research Projects

Pervasive Computing

- Pervasive Computing:
 - Computationally active environments
 - Gracefully integrated with human users
- Main Approaches:
 - Tags
 - Smart Spaces
 - Wearable Computing





Example Pervasive Infrastructures for Seniors

- Apartment consoles, personalized databases
- Personal badge locators with help functions
- RF and IR locators
- Environmental sensors for location, weight, and speech recognition
- Pervasive databases - Personalized databases for status and history
- Plethora of Wearable Systems
- Infrastructures for User authentication, Secure Networking, Device & Service discovery



Applications and Challenges

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Prominent Application

- Alleviation of Cognitive Problems, e.g.,
 - Prevention of Cognitive Decline
 - Mild Dementia
 - Alzheimer's disease (AD)
- Highest Societal Impact e.g.,:
 - By 2020, 40 million people will be affected by AD worldwide and by 2050, the number could be increased to 80 million
- Applications should target three complementary aspects:
 - Boost Mental Activation (i.e. Cognitive Training)
 - Enhance Social Interaction
 - Promote Physical Exercise



Challenges (1)

- Technical:
 - Integration i.e. (Mental Activation + Social Interaction + Physical Exercise)
 - Ergonomic and Easy to use interfaces
 - ICT not isolated from human factors
 - Combine the human care and support factor with innovative ICT enabled services and independent living technologies



Challenges (2)

- Organizational / Deployment:
 - Blend ICT systems into existing processes
 - In homes, care centers, leisure centers, hospitals
 - Active involvement of gerontologists, caretakers, neuropsychologists, geriatric internists
- Economical:
 - Financing of the ICT Systems TCO (Total Cost of Ownership)
 - Balance cost distribution (public authorities, private entities, end-users?)



Active Involvement of All Stakeholders Required

- Elderly residents / users
- Families of the residents
- Physicians and health care providers
- Experts (gerontologists, caretakers, neuropsychologists, geriatric internists)
- Staff caregivers
- Teams monitoring staff and residents
- Researchers working towards improving the quality and efficiency of care delivery



Innovative Interfaces

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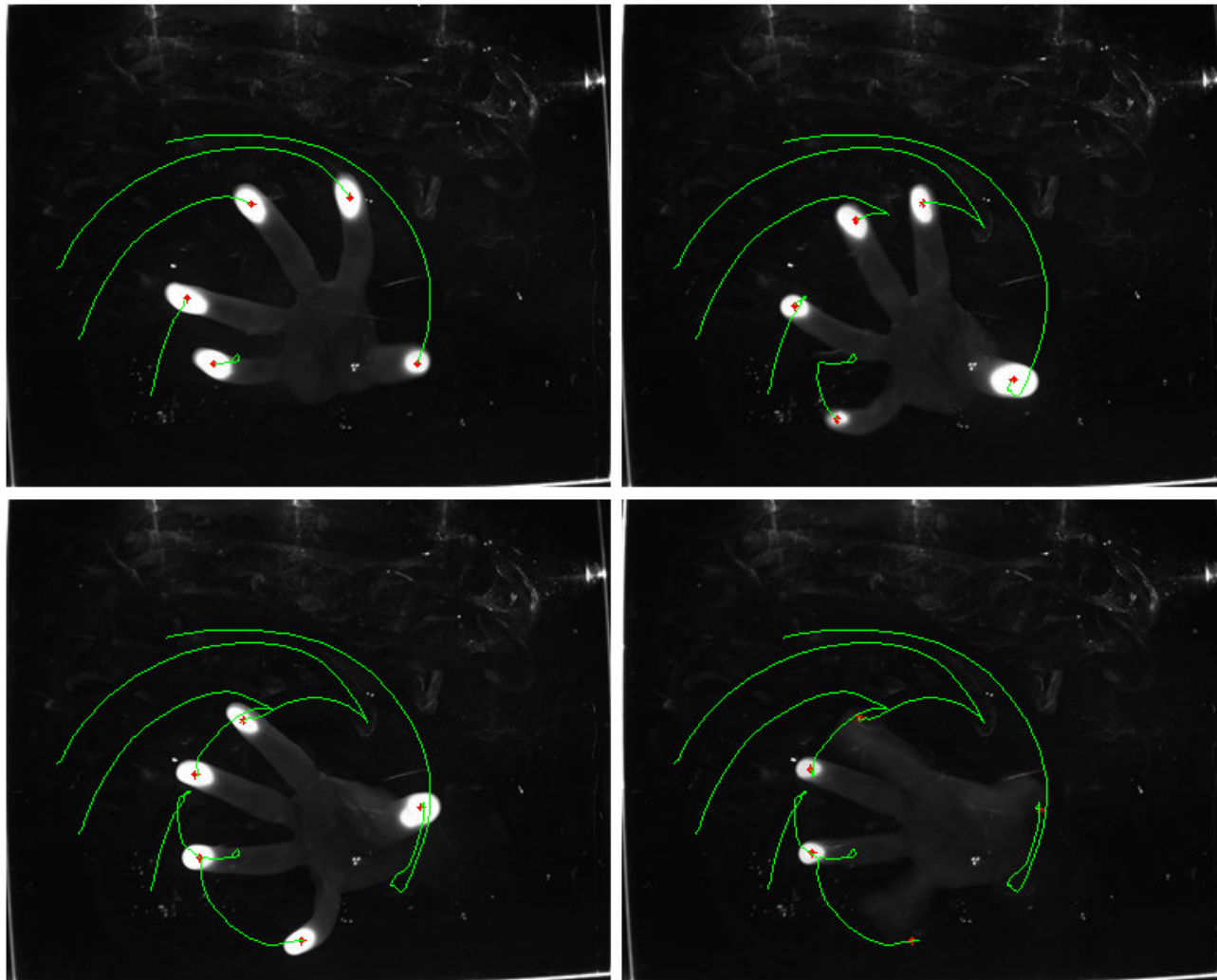
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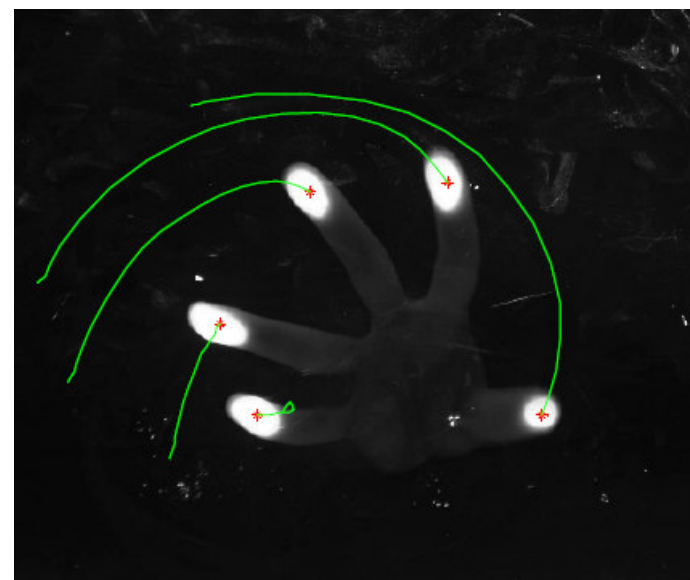
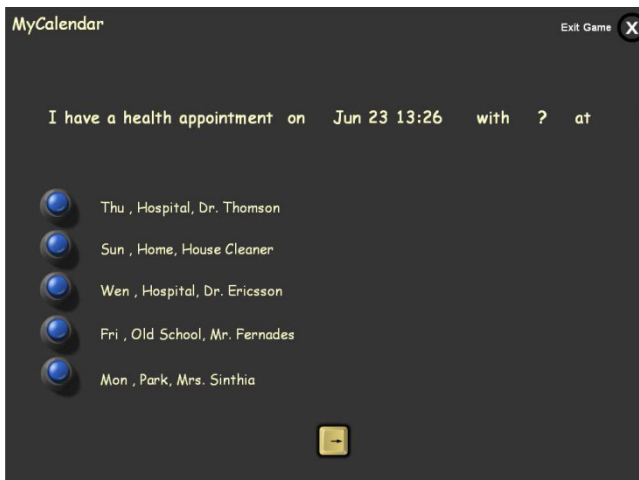
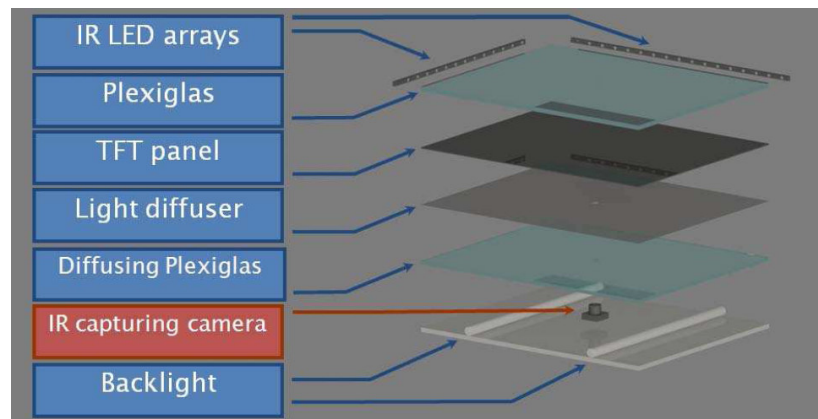


AIT Multi-touch Surface Technology: Tracking Fingertips





Ergonomic Applications on the Multi-touch Surface





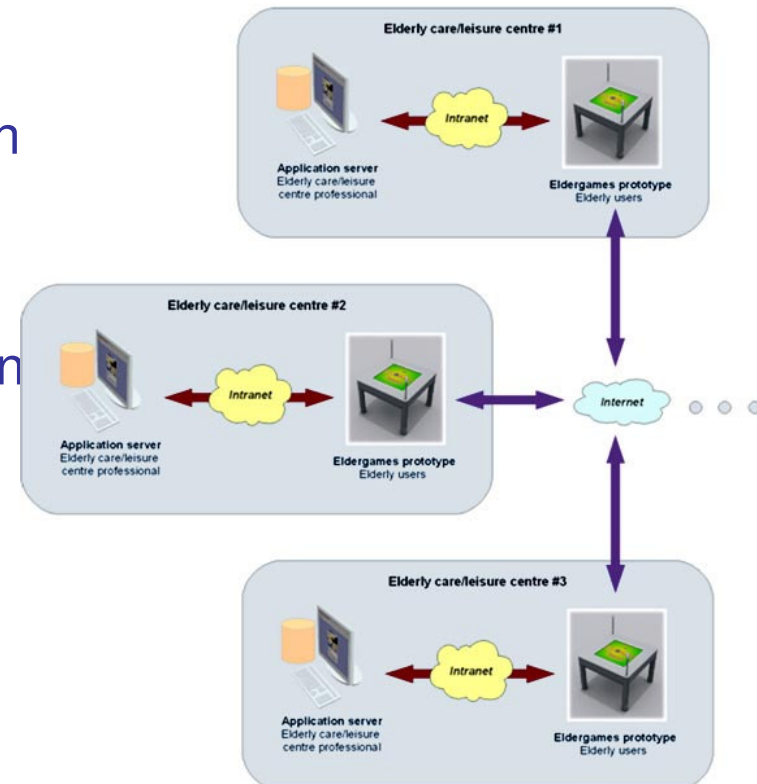
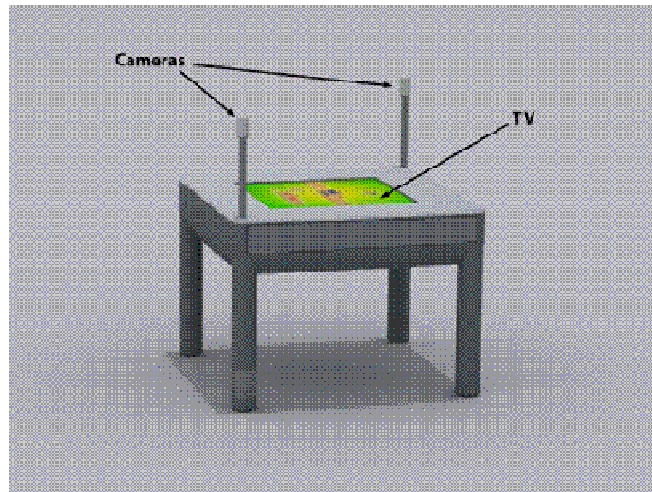
Representative EC Co-funded Research Projects

*(Emphasis on Ergonomic Interfaces and Cognitive
Training)*

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Elder Games

- Motivating Play Environment
- Research on specific needs of elderly people
- Creation of an entertainment offering with high preventive and therapeutic value
- Particular emphasis on cognitive skills of senior citizens
- Could be combined with social interaction services
- More info: <http://www.eldergames.org>



Vital Mind

- Highly cognitive brain fitness content R&D
- Cognitive psychology, the television medium and advanced interactive ICT
- Enable the elderly to actively participate in mind fitness exercises while they are sitting in front of their TV set.
- New methods of UI - Advances UI in front of the iDTV
- Usage of UFD with STB and authoring tools for iDTV content creation
- More Information:
 - <http://www.vitalmind-project.eu/>



HERMES

- FP7 Project Co-funded by the EC (Contract No: 216709) on ICT for Ageing Well
- Memory Aids and Cognitive Training for Ageing Well
- World's top Speech Recognition (IBM) and Video Processing Algorithms (AIT) customized to Elderly needs
- Support in domestic but also outdoor environments
- More Info: <http://www.fp7-hermes.eu>

