Studying Contextual Human-Robot Interaction

Usability and Beyond

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1 Introduction

• Up to now: Developers and expert users interacted with robotic systems

• Trend: new generation of service robots for interaction with naive users
  - From developer-centered robotic interface to user-friendly, intuitive natural interaction

• Topics:
  - Long term human-robot interaction
  - Recognize and understand human behavior
  - Robots in education, therapy and elderly care
  - Social learning and learning by demonstration
  - Cooperation and collaboration of human-robot teams
Topics of the ICT&S Centers

- **Usability**
  - How to design a robot for inexperienced users? How to support effective, efficient and intuitive Human-robot interaction?

- **User Experience**
  - Which robotic design is positive experienced in which context? (humanoid vs. functional design, simulation of social cues, emotion recognition and presentation)?

- **Social Acceptance**
  - Which factors support that users are willing to employ robotic systems on a long term? Which factors cause rejection?

- **Societal Impact**
  - How does the usage for robots in everyday contexts influence the society (ethics, education, legal aspects etc.)?
Methods of the ICT&S

- Focus groups
- Controlled experiments
- Field trials
- Prototypical implementation of HRI
- Expert evaluations
- Expert interviews
ICT&S Center and ROBOT@CWE

• Role:
  - concerned with the interactions and the interplay between humans and robots from the individual to the society
  - analyse the requirements, give design recommendations and evaluate the robotic systems
  - contribute to the design and development of human-centred, usable and socially acceptable robotic work environments

• Main Tasks:
  - usability & user experience evaluations
  - interaction models
  - technology acceptance assessment & social appliance recommendations

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http://www.hciunit.org
Case study: Interaction with AIBO

• Goal: first time reactions in child-robot interaction (how does emotional attachment of children evolve?)
  - Investigating interaction on the visceral, behavioural and reflective level

• Study setting:
  - AIBO in the free exploration mode – direct HRI via toys (ball & bones), voice control and AIBO-cards
  - Shopping center in Salzburg
Case study: Teaching HOAP-3

A user study with HOAP-3 was conducted at EPFL in Lausanne (CH) from 11th to 14th of August 2008.

• **Goal:** Controlled Experiment on learning by demonstration
  - How do novice users experience the teaching of the humanoid robot HOAP-3?

• **Tasks**
  - 1) Teach the robot to push a box away from its working space into your direction.
  - 2) Teach the robot to close a box by its own.
Contact

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