Lab Course
Social Robotics
Summer Term 2018

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http://gki.informatik.uni-freiburg.de/teaching/ss18/robotics-labcourse.html

Practical Courses in General

- „The participants learn to work on tasks from different areas of computer science under the technical conditions given. They will **develop the required systems** and participate in projects. Students will learn to **acquaint themselves with a given topic**, to work in a modern development environment and to observe common quality standards.“
- 6 ECTS = 180 Hours Workload = 180/13 = **13.8 Hours per Week**
  - Good News: When it's done, it's done: No writing, esp. no exams!
- By the end of the semester: Each group presents their results to an interested audience consisting of the members of the GKI group.

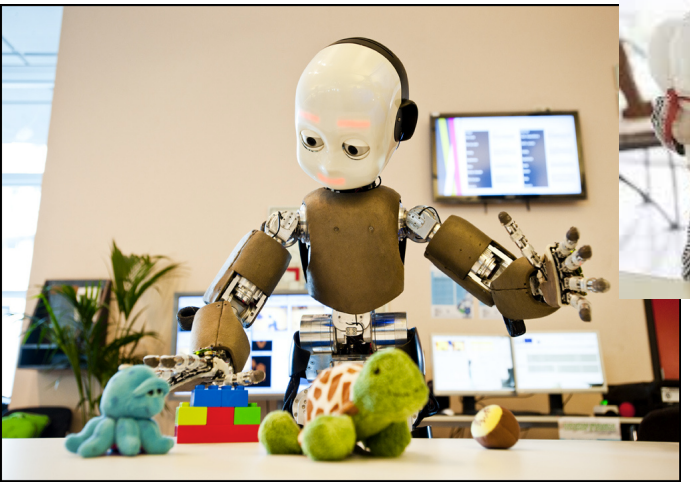
Organization

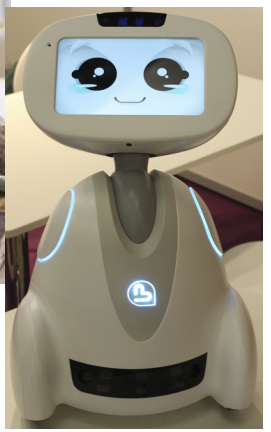
- On mondays we meet in the lab at 14:00 and discuss ideas, exchange experiences, and solve problems.
- You organize yourself in groups of 2 to 4 people.
- To gain access to the lab please send me an e-mail (lindner@informatik....) containing your name and your UB number.

Questions regarding organization?

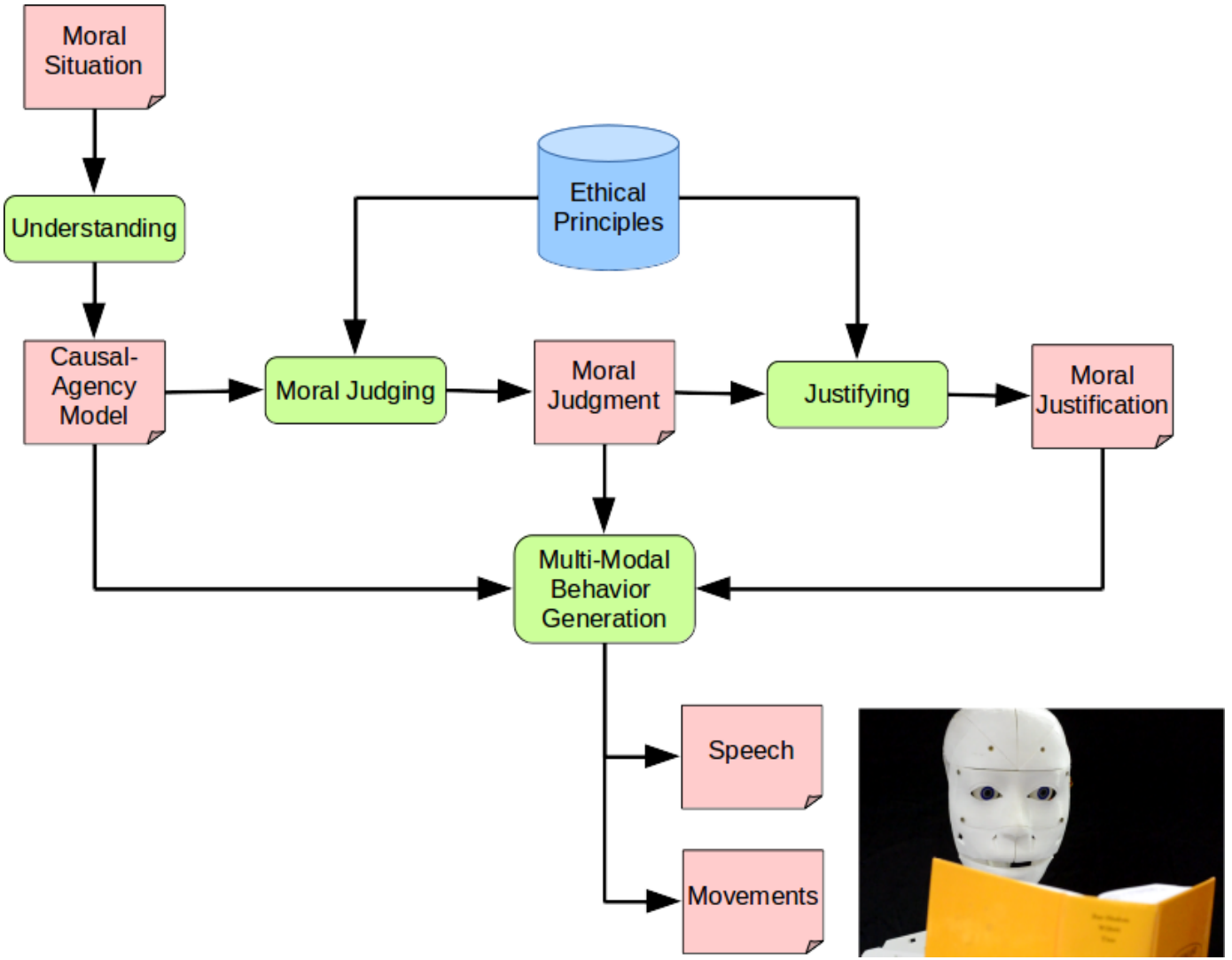
Social Robotics: Definitions

- *Fong, Nourbakhsh, Dautenhahn (2003)*: „Social robots are embodied agents that are part of a heterogeneous group: a society of robots or humans. They are ***able to recognize each other*** and ***engage in social interactions***, they ***possess histories*** (perceive and interpret the world in terms of their own experience), and they ***explicitly communicate*** with and ***learn from each other***.“
- *Breazeal (2002)*: „We interact with [a sociable robot] as if it were a person, and ultimately as a friend.“





Ethical Reasoning Robot Immanuel



Current & Past Projects and Theses

- „Implementation of a Domain-Specific Language for Controlling an Anthropomorphic Robot Head“ (I. Dobrusin)
- „Schalllokalisation für einen anthropomorphen Roboterkopf“ (J. Denk)
- „Erkennen von Backchannel-Möglichkeiten in Sprachsignalen mit Praat“ (F. Buerkle)
- „The Effect of a Robots Uncertainty on Humans' Blame Attribution and Impression Formation“ (H. Stellmach)
- „Automated gaze behaviour generation based on information structural components“ (M. Ingold)
- „Sentimentanalyse für IMMANUEL“ (T. Probst)
- Without title:
  - Human tracking (V. Bheed)
  - Human-Robot Asymmetry (L. Wächter)
  - Uncertainty and Moral Character (H. Stellmach)
  - Object detection in depictions of moral dilemmas (V. Rao)
  - Expressing Tearfulness (J. Götz)

Broader Survey

- „Snoozle, an actuated pillow that supports consistent bedtimes by inviting users to bed, and improves the sleeping experience by enhancing the feeling of co-presence“ https://www.youtube.com/watch?v=JW3wuDQ3vFA
- The caring bear Huggable: https://www.youtube.com/watch?v=QwTCmbq9C4o
- The musical companion Travis: https://www.youtube.com/watch?v=JgGvArz1X40
- Handmade Social Robot Blossom: https://www.youtube.com/watch?v=okFoKJK_N3w

Possible Projects

- A Wizard-of-Oz interface for Immanuel, e.g., enabling speech input to be converted into robot behavior (see Huggable)
- Using Immanuel as a companion for Co-X-ing, e.g., Co-listening to music (see Travis), Co-watching movies (see Blossom), Co-playing games (e.g., text adventures using the projector).
- Design, 3D print, and animate body parts: E.g., arms/hand to enable giving hands or making gestures, more realistic eye mechanism (eye brows, eyelids), enhanced torso that exhibits breathing behavior and heart beat.
- Something totally different like e.g. turning an every-day object to a social robot (see Snoozle).

Materials

- 3D printer
- Servo motors
- Arduino boards
- OpenCM9.04 boards
- Cameras (ceiling camera, webcams, kinects)
- Laser scanners
- Special equipment can possibly be purchased

Now:

Collect your ideas &
Form groups of 2 to 4 people

Task for next time:

Prepare a short presentation of your idea so that it can be discussed next monday

&

Make up a time plan that defines milestones and when you want to reach these.

(slides not necessary)

Next Monday

- Each group presents their ideas and time plans.
- We will discuss in plenum to what extend your idea can realistically be realized within the time available.
- We will identify the technical means you may want to use to realize your idea.

The End.