Social Robotics

Albert-Ludwigs-Universität Freiburg

Bernhard Nebel, Felix Lindner, Thorsten Engesser, Barbara Kuhnert, Laura Wächter

WS 2017/18
Lecturers

**Prof. Dr. Bernhard Nebel**  
Room 52-00-028  
Phone: 0761/203-8221  
email: nebel@informatik.uni-freiburg.de

**Dr. Felix Lindner**  
Room 52-00-043  
Phone: 0761/203-8251  
email: lindner@informatik.uni-freiburg.de
Brief CV

- **2002-2009**: Student of Computer Science at University of Hamburg
- **2009-2015**: Research Assistant at University of Hamburg
- **2015**: Dissertation on robot social navigation
- **Since 2015**: Lecturer at University of Freiburg
  - **Research Interest**: Robot Companions, Machine Ethics
    (http://www.hera-project.com/)
Teaching Assistants

Thorsten Engesser  Room 52-02-019
Phone: 0761/203-8278  email: engesser@informatik.uni-freiburg.de

Dipl.-Psych. Barbara Kuhnert
email: kuhnertb@informatik.uni-freiburg.de

Laura Wächter
email: waechter.iig@gmail.com
Lectures

Where
SR 01 – 018, Building 101

When
Lecture: Tuesday 14:00 – 16:00

Web page
http://gki.informatik.uni-freiburg.de/teaching/ws1718/socrob/
Classroom Training

Where
Building 101, Room 01–018

When
Thursday 14:00 – 16:00
Exercises: Procedure

- Exercise sheets will be handed out and posted on the web page on Monday.
  - Exercise sheets contain **in-class exercises** and **homework exercises**.
  - In-class exercises are solved live on Thursday.
  - Homework exercises are solved at home and handed in for marking.
- For the homework exercises you work in groups of size 2–3.
- Each group hands in one solution (in English or in German).
- Solutions have to be handed in until Monday a week after.
  - Every group gets access to a git repository (see current exercise sheet for instruction
    [http://gki.informatik.uni-freiburg.de/teaching/ws1718/socrob/exercises.html](http://gki.informatik.uni-freiburg.de/teaching/ws1718/socrob/exercises.html))
Examination

- **Admission to the exam:** necessary to have reached at least 50% of the points on exercises.
- An oral or written examination takes place in the semester break.
- The examination is obligatory for all Bachelor students (oral) and Master students (oral or written).
Discussion

Expectations
# Course Outline

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<th>Date</th>
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<td>17.10</td>
<td>L: Organization &amp; Expectations</td>
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<td>19.10</td>
<td>L: Video-Session: Social Robots in the Media</td>
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<td>24.10</td>
<td>L: Introduction to Social Robotics as a Science</td>
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<td>26.10</td>
<td>Tutorial: Introduction to R</td>
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<td>02.11</td>
<td>P: Presentation of self-designed social robots</td>
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<td>07.11</td>
<td>L: Empirical Methods &amp; Descriptive Statistics</td>
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<td>L: Inferential Statistics</td>
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<td>21.11</td>
<td>L: Chi-Square &amp; Fisher’s Exact Test</td>
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<td>26.11</td>
<td>L: Special Topic „Trust in HRI“</td>
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<td>30.11</td>
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<td>05.12</td>
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<td>12.12</td>
<td>L: Comparing means using ANOVA</td>
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<td>L: Non-parametric tests</td>
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<td>30.01</td>
<td>Barbara on Factor Analysis &amp; Robot Personality</td>
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<td>01.02</td>
<td>Barbara on Factor Analysis &amp; Robot Personality</td>
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<td>06.02</td>
<td>Closing Week &amp; Exam Preparation</td>
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<td>08.02</td>
<td>Closing Week &amp; Exam Preparation</td>
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Objectives of this Course

- You have an idea about how to conduct your own empirical research in social robotics (or on some other HCI related topics) as your BA/MA project and/or BA/MA thesis:
  - You can read and understand scientific publications on social robotics.
  - You can formulate your own research questions.
  - You are able to operationalize these research questions.
  - You know how to report your own research results.

6.1 Results
We recruited 20 participants (8 female) from the local university population. The mode age (collected in ranges) was 26-30, at 35%.

Repeated-measures ANOVA comparing all cue against the no-cue case) showed an effect of cue type on response time (Figure 4b, $F_{2,8,52.3}=41.9, \eta^2=.69, p<.001$, Greenhouse-Geisser correction), accuracy (Figure 4c, $F_{2,0,38.3}=30.8, \eta^2=.62, p<.001$, Greenhouse-Geisser correction), and cognitive load (Figure 4a, $F_{2,2,41.8}=6.5, \eta^2=.26, p=.003$, Greenhouse-Geisser correction). Planned contrasts against no cue showed all others to be more accurate and to have lower cognitive load ($p<.002$), while circle, bounce, and dark had faster response time; no response-time difference was found against target ($p<.01$). While Figure 4 shows overall means and confidence intervals, the within-participants statistics uses relational scores.

A Wilcoxon signed-rank test (one-tailed) confirms hypothesis H.1A predicting that Immanuel is perceived as more moral after the interaction than the participants’ a-priori attribution of morality to robots in general ($Z(20) = -3.4, p < .001$). Further exploration of the semantic differential using two-tailed Wilcoxon signed-rank tests indicate that Immanuel appears more talkative ($Z(20) = -3.23, p = .001$), more
What the Social Robotics lecture is not

- It’s not a robotics course
- It’s not an AI course
- It’s not a machine learning course
Literature

DISCOVERING STATISTICS USING R
ANDY FIELD | JEREMY MILES | ZOE FIELD

Bortz
Schuster
Statistik
für Human- und Sozialwissenschaftler
7. Auflage

www.lehrbuch-psychologie.de

Designing Sociable Robots
CYNTHIA L. BREAZEAL

Springer
Cliffhanger: Social Robots in the Media and Beyond

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