

## Social Robotics

Albert-Ludwigs-Universität Freiburg



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Barbara Kuhnert, Laura Wächter  
WS 2017/18

## Lecturers



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## Brief CV



- **2002-2009:** Student of Computer Science at University of Hamburg
- **2009:** Diploma Thesis on robots using natural-language route instructions for navigation.
- **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/>)



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## Teaching Assistants



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### Where

SR 01 – 018, Building 101

### When

Lecture: Tuesday 14:00 – 16:00

### Web page

<http://gki.informatik.uni-freiburg.de/teaching/ws1718/socrob/>

### Where

Building 101, Room 01–018

### When

Thursday 14:00 – 16:00

- 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>

- **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

17.10.	L: Organization & Expectations
19.10.	L: Video-Session: Social Robots in the Media
24.10.	L: Introduction to Social Robotics as a Science
26.10.	Tutorial: Introduction to R
02.11.	P: Presentation of self-designed social robots
07.11.	L: Empirical Methods & Descriptive Statistics
09.11.	Classroom training
14.11.	L: Inferential Statistics
16.11.	Classroom training
21.11.	L: Chi-Square & Fisher's Exact Test
23.11.	Classroom training
28.11.	L: Special Topic „Trust in HRI“
30.11.	Reading Group
05.12.	L: Comparing means using t-Test
07.12.	Classroom training
12.12.	L: Comparing means using ANOVA
14.12.	Classroom training
19.12.	L: Non-parametric tests
21.12.	Classroom training
09.01.	VL: Special Topic „Robotic Companions“
11.01.	Reading Group
16.01.	L: Correlations
18.01.	Classroom training
23.01.	L: (Linear) Regression
25.01.	Classroom training
30.01.	Barbara on Factor Analysis & Robot Personality
01.02.	Barbara on Factor Analysis & Robot Personality
06.02.	Closing Week & Exam Preparation
08.02.	Closing Week & Exam Preparation

# 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



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