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# Course Guide Summer School Applied Social Robotics

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# 1 Introduction

Are you interested in how social robots can be implemented in daily life, for example in education, in healthcare, and in hospitality? Do you want to come up with innovative solutions for long time societal problems? And do you think robots can be part of these solutions? Then this summer school is designed for you! During this summer school, you will work in a multidisciplinary research team and learn how people interact with robots, how to design social robots, how to set up a human-robot experiment. You and your teammates come from various fields such as psychology, social work, education, healthcare, engineering, media, IT, communication, and business. All of you will bring specific knowledge from your field and together you will find creative ways to utilise these skills. Combining your strengths will give you the opportunity to come up with and design new solutions in the field of social robots.

In this course, both theoretical background and hands-on experience on Social Robotics will be provided. Knowledge about essential theories, concepts, principles, and tooling will be addressed. This knowledge enables the students to design and experiment with applying Social Robotics in a responsible way.

After the course, the student is able to:

- explain and select various design methods applicable to social robots in several domains;
- apply various design methods applicable to social robots in several domains, and thereby can design a social robot for a specific scenario;
- present a social robot scenario to an academic/ professional audience;
- explain the basic theories, concepts, and principles related to the domain of human-robot interaction;
- critically describe how the design (e.g. embodiment and anthropomorphism) of a social robot influences how humans interact with robots;
- build/configure a social robot for a specific purpose within a domain, such as education, healthcare, or hospitality;
- set up an experiment to assess the effect of a social robot;
- analyze and explain experimental data results;
- present a project using a scientific minipaper.

## 1.1 Target audience

Students and professionals who are interested in Social Robots and how to design and apply them in practice. Although a technical background or expertise is not required, affinity with and interest in technology is recommended for this course. The level of difficulty of the course is bachelor/advanced bachelor.

## 1.2 Aim of the course

Provide course members with insights and practical experience on Applied Social Robotics by addressing Design Methods for Social Robots, Human-Robot Interaction, and a project in which you need to design and demonstrate a Social Robot to tackle one or more societal challenges.

## 1.3 Study load

The study load of the Summer School Applied Social Robotics is set at 5 days, 6-8 contact hours per day, 1-2 self-study hours per day.

# 2 Program schedule and literature

*Literature might still be updated*

Date	Time	Subject	Lecture #	Teacher	Literature
13-07-26	9:00 - 12:00	Introduction to Social Robotics And meeting the robots	1	Mirjam	Leite, I., Martinho, C., & Paiva, A. (2013). Social robots for long-term interaction: a survey. <i>International Journal of Social Robotics</i> , 5(2), 291-308. <a href="#">Link</a>
13-07-26	13:00 - 16:00	Design Thinking	2	Mirjam	
14-07-26	9:00 - 12:00	Social robots in education	3	Veerle	Belpaeme, T., Kennedy, J., Ramachandran, A., Scassellati, B., & Tanaka, F. (2018). Social robots for education: A review. <i>Science robotics</i> , 3(21), eaat5954. <a href="#">Link</a>  Konijn, Elly A., Matthijs Smakman, and Rianne van den Berghe. "Use of robots in education." <i>The International encyclopedia of media psychology</i> (2020): 1-8. <a href="#">Link</a>

14-07-27	13:00 - 16:00	Setting up your experiment and programming the robots	4	TBA	<p>Introduction to a social robotics experiment</p> <ul style="list-style-type: none"> <li>- Focal points for experiment-setups</li> <li>- How to prepare for a valid and reliable experiment</li> <li>- Using experimental and control groups</li> <li>- Setting up your own experiment</li> <li>- Q&amp;A</li> </ul>
15-07-26	9:00 - 12:00	Social robots in healthcare	5	Mirjam	<p>Kemenade, M.A., Hoorn, J.F., &amp; Konijn, E.A. (2019). Do You Care for Robots That Care? Exploring the Opinions of Vocational Care Students on the Use of Healthcare Robots. <i>Robotics</i>, 8, 22. <a href="#">Link</a></p> <p>Vallès-Peris, N., Angulo, C., &amp; Domènech, M. (2018). Children's Imaginaries of Human-Robot Interaction in Healthcare. <i>International journal of environmental research and public health</i>, 15(5), 970. doi:10.3390/ijerph15050970 <a href="#">Link</a></p>
15-07-26	13:00 - 16:00	Running the experiment	6	Mirjam	
16-07-26	9:00 - 12:00	Robots in hospitality	7	Veerle	<p>Ivanov, S. H., &amp; Webster, C. (2017). Adoption of robots, artificial intelligence and service automation by travel and hospitality companies—a cost-benefit analysis. <i>Artificial Intelligence and Service Automation by Travel, Tourism and Hospitality Companies—A Cost-Benefit Analysis</i>. <a href="#">Link</a></p>
16-07-26	13:00 - 16:00	Processing the results of the experiment	8	TBA	
17-07-26	9:00 - 12:00	Writing your research letter, questions	9	Veerle	

		and walk-in session			
17-07-26	13:00 - 16:00	Presentations, Q&A and drinks	10	Everyone	

### 3 Assignment

The final assignment of this Summer School course Applied Social Robots is: build/configure a social robot for a specific purpose and test the robot by means of an experiment. For this assignment student will work in small groups (2 to 3 students per group).

#### 3.1 Deliverables

Each group will write a research letter and create a short vlog. The **vlog** should present the research process that each group went through this week: from research design to analysing results. The **research letter** should be a short account of your research; research letters must not exceed 800 words, 3 illustrations or tables and up to 10 references, preferably recent publications. No abstract should be included.

#### 3.2 Assessment criteria

Each assessment element will be assessed using a pass / fail system. To pass the course, students need to pass all assignments

#	Learning objective	Assessment element	Weight	Criteria
1	<i>The student is able to:</i>			
2	explain and select various design methods applicable to social robots in several domains;	Final presentation incl. Q&A	5%	The student can explain why certain design methods are chosen correctly
3	apply various design methods applicable to social robots in several domains, and thereby can design a social robot for a specific scenario;	vlog	5%	The vlog shows how design choices are made and how these affected robot design/behaviour.
4	present a social robot scenario to an academic/ professional audience;	Final presentation incl. Q&A	10%	The student can answer questions on their research project in an academic/professional manner.

5	explain the basic theories, concepts, and principles related to the domain of human-robot interaction;	Final presentation incl. Q&A	5%	The student can answer questions on the basic theories, concepts and principles related to HRI correctly
6	critically describe how the design (e.g. embodiment and anthropomorphism) of a social robot influences how humans interact with robots;	Final presentation incl. Q&A	5%	The student can answer questions on the who the design of a robot affects the HRI correctly
7	build/configure a social robot for a specific purpose within a domain, such as education, healthcare, or hospitality;	Vlog	20%	The vlog shows the build or configured robots abilities and why this is relevant of a specific domain.
8	set up an experiment to assess the effect of a social robot;	Vlog	20%	The vlog shows the set-up of the experiment, and illustrates how participants interacted with the robot
9	analyse and explain experimental data results;	Paper	10%	The research letter describes the empirical data gathered by the experiment and the data is analysed in a critical way.
10	present a project using a research letter	Paper	20%	The research letter describes the research academic relevance, and background, the method, results, conclusions in a concise and critical way, following the criteria of the assignment .