

Social Robots Personalisation: At the Crossroads between Engineering and Humanities (CONCATENATE)

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ABSTRACT

Nowadays, robots are expected to interact more physically, cognitively, and socially with people. They should adapt to unpredictable contexts alongside individuals with various behaviours. For this reason, personalisation is a valuable attribute for social robots as it allows them to act according to a specific user's needs and preferences and achieve natural and transparent robot behaviours for humans. If correctly implemented, personalisation could also be the key to the large-scale adoption of social robotics. However, achieving personalisation is arduous as it requires us to expand the boundaries of robotics by taking advantage of the expertise of various domains. Indeed, personalised robots need to analyse and model user interactions while considering their involvement in the adaptive process. It also requires us to address ethical and socio-cultural aspects of personalised HRI to achieve inclusive and diverse interaction and avoid deception and misplaced trust when interacting with the users. At the same time, policymakers need to ensure regulations in view of possible short-term and long-term adaptive HRI. This workshop aims to raise an interdisciplinary discussion on personalisation in robotics. It aims at bringing researchers from different fields together to propose guidelines for personalisation while addressing the following questions: how to

define it – how to achieve it – and how it should be guided to fit legal and ethical requirements.

CCS CONCEPTS

• **Human-centered computing** → **Collaborative and social computing**; • **Applied computing** → **Law, social and behavioral sciences**; **Arts and humanities**; **Education**.

KEYWORDS

Personalisation, Social Robotics, Human-Centred Design, HRI

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LINKS

Workshop's Website: <https://sites.google.com/view/concatenate-hri>

Workshop's Twitter account: <https://twitter.com/PerseoWorkshop>

1 MOTIVATION

Over the last decades, significant efforts in academia and industry have been deployed to achieve cutting-edge personal robots. Nevertheless, the large-scale adoption of robots remains a challenge to be addressed. Personalisation, which is the adaptation of the robot's characteristics and behaviours to different users regarding their needs, preferences, and personalities, could constitute one solution

* Authors contributed equally to this research.

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to this challenge. Indeed, personalisation can improve the quality of human-robot interaction, whether concerning the technical, social, or ethical impacts. However, several research challenges in personalisation remain to be solved.

Personalised robots need to perform a task while following the specific user’s needs, preferences, and context of use. They require the ability to model the interactions with human beings, adapt and parameterise their behaviours to the context and make transparent decisions while taking into account the user’s information.

Alongside the technical challenges that personalisation raises, this process must also be understood in terms of its psychological effects on the user and the individual determinants that would lead a user to prefer one kind of personalisation over another. The extent to which the user is involved in the adaptation has to be considered according to the requirements of both the user and the context of use of the robot.

Moreover, personalisation can bring about significant mid-term and long-term societal impacts. Thus, it is crucial to address the ethical and socio-cultural aspects of personalised human-robot interaction and to propose regulations to ensure short-term and long-term adaptive interactions.

The goal of this workshop is to tackle the aforementioned challenges and contribute to proposing solutions and building guidelines that would lead to transparent, safe, and trustworthy interactions with personalised robots in human society.

2 TOPICS AND TARGET AUDIENCE

The workshop aims to bring together scholars and practitioners interested in building a successful personalised interaction between people and robots and in sparking an interdisciplinary conversation on personalisation in robotics. We strongly encourage submissions from researchers at any stage of their career, including, but not limited to, the following topics of interest:

- Theories and methods of personalisation;
- Physical, cognitive and social adaptation;
- Transparency and XAI in HRI;
- Robot law and ethics on personalisation;
- Inclusion and diversity in personalised HRI;
- User psychology in personalised HRI;
- Modelling and parameterising interactions;
- Metrics for evaluating personalised HRI

The workshop welcomes contributions from researchers who promote inclusive social HRI and personalised robotics. Since we are a team of researchers in various fields — including robotics, engineering, ethics, law, and psychology — our target audience comprises many research environments from around Europe and beyond. We invite authors to submit a 2-page abstract or full papers (up to 6 pages) on original and unpublished research.

3 PLAN FOR RECRUITING PARTICIPANTS

We commit to promoting and increasing the visibility of the workshop through the most popular channels to reach the appropriate audience, such as robotics mailing lists (e.g. EU-robotics, HRI, Robotics-worldwide), social media (Twitter, LinkedIn), and to inviting leading researchers in the fields.

4 PROGRAM

The workshop is offered in a hybrid fashion and is organised in four main sessions. Each session covers a different topic of HRI and personalisation and lasts 90 minutes, as depicted in Table 1. Each session includes 40 minutes of keynote speech and questions and 50 minutes of accepted paper/poster presentations. A fifth session is dedicated to a discussion, where attendees are invited to engage the keynote speakers and the group in a conversation about the perspectives and challenges of social robot personalisation. The workshop is interspersed with coffee-break sessions during which attendees can network and discuss further.

Confirmed Keynote Speakers

- **Hae Won Park**, Massachusetts Institute of Technology, USA: “Personalising HRI through Social, Emotional and Relational AI”.
- **Antonio Sgorbissa**, University of Genoa, Italy: “Social robots that know people”.
- **Maartje de Graaf**, Utrecht University, Netherlands: “Tailoring HRIs to the specific user needs at different stages in the technology acceptance process”.
- **Astrid Weiss**, Vienna University of Technology, Austria: “Co-shaping the social human-robot relation. Yes please, but how?”.

5 EXPECTED PARTICIPANTS

We believe that the interdisciplinary nature of our workshop is of high relevance and interest to the specific edition of the HRI conference. We expect a strong attendance with a minimum of 20 submissions and 50 participants. We already have 30 participants within the European Training Network PERSEO, i.e. 15 early-stage researchers and their supervisors.

6 PLAN FOR DOCUMENTING THE WORKSHOP

The information about the workshop and other relevant material will be available on our website. The accepted papers will be published on the workshop website, in arXiv and in the website of the European Training Network PERSEO, as it supports this workshop. Furthermore, we are also aiming to organise a follow-up special issue in a journal, where accepted authors will be invited to send extended versions of their papers.

7 ORGANISERS

The organising team consists of researchers from different geographic locations, genders, and levels of seniority. The diversity of disciplinary backgrounds in the organising team will ensure the recruitment of a multidisciplinary audience. Specifically, the organisers are:

Imene Tarakli is an Early Stage Researcher (ESR) for the ETN PERSEO project. Her PhD research focuses on developing and evaluating the use of personalised cognitive robotics in education. She received her BEng degree from Ecole Nationale Polytechnique and her M.Sc. degree in Intelligent Systems from Sorbonne University.

Georgios Angelopoulos is an ESR at the PERSEO project and is working toward a PhD degree at the University of Naples Federico

Table 1: The schedule consists of 4 thematic sessions and a discussion panel. Each thematic session starts with a keynote speech on the topic followed by 5 article presentations.

8:00 - 8:30	Workshop Introduction
8:30 - 9:10	Session 1 - Keynote - Antonio Sgorbissa: "Social robots that know people"
9:10 - 10:00	Session 1 - Paper Presentations
10:00 - 11:00	Posters & Coffee Break
11:00 - 11:40	Session 2 - Keynote - Astrid Weiss: "Co-shaping the social human-robot relation. Yes please, but how?"
11:40 - 12:30	Session 2 - Paper Presentations
12:30 - 14:00	Lunch
14:00 - 14:40	Session 3 - Keynote - Hae Won Park: "Personalising HRI through Social, Emotional and Relational AI"
14:40 - 15:30	Session 3 - Paper Presentations
15:30 - 15:50	Coffee Break
15:50 - 16:30	Session 4 - Keynote - Maartje de Graaf: "Tailoring HRIs to the specific user needs at different stages in the technology acceptance process"
16:30 - 17:20	Session 4 - Paper Presentations
17:20 - 18:00	Session 5 - Discussion Panel with Keynote Speakers

II. His main goal is to investigate the role of dynamical properties of the body movements and non-verbal cues in making the robot's motion and interaction behaviour transparent to humans. He received his M.Sc. degree in Intelligent and Interactive Systems from the Universitat Pompeu Fabra, Spain.

Mehdi Hellou is an ESR at the University of Manchester. He received his engineering degree from Polytech Sorbonne and master degree in AI from Sorbonne University. His PhD focuses on applying the Theory of Mind's (ToM) for personalised interactions by designing and testing an artificial cognitive system for social robots.

Camille Vindolet is an ESR for the ETN PERSEO project. Her PhD topic is on interactive kinesthetic teaching for conditional tasks. She has an engineering (Mines de Saint-Etienne) and Master degree (Centrale Nantes, Advanced Robotics CORO-IMARO).

Boris Abramovic is MSCA Fellow in the ETN PERSEO and the research group of the Chair Philosophy of Media and Technology at the University of Vienna. His research bridges social robotics, ethics and art. He has a Master of Arts degree in Media Art Cultures from Aalborg University in Denmark.

Rocco Limongelli is a qualified Solicitor of the Senior Courts of England and Wales, and a member of the Law Society of England and Wales. His research focus is on regulating social robots, with a particular interest in the phenomenon of deception and manipulation in Human-Robot Interaction (HRI). Rocco has also been included by Forbes Italia in the 30 Under 30 List for 2022.

Dimitri Lacroix is an ESR at the Center for Cognitive Interaction Technology (CITEC), in Bielefeld University. His work in the PERSEO project focuses on the influence of personalisation vs. customisation on trust towards robots. He received his master's degree in Computer Science from Tours University and a master's degree in Cognitive Psychology from Paris 8 University.

Andrea Bertolini is Assistant Professor of Private Law at the Dirpolis Institute, Scuola Superiore Sant'Anna, and adjunct professor in private law at the University of Pisa. He is the director and scientific coordinator of the European Centre of Excellence on the Regulation of Robotics and AI. His published research ranges from private law to regulation of robotics and AI and technoethics, with a comparative and law and economics approach, and a focus on

alternative liability models, product safety regulation and certification, insurance and risk management, human machine interaction, user manipulation and deception.

Silvia Rossi is an associate professor at the Department of Electrical Engineering and Information Technologies, University of Naples Federico II. She is Associate Editor for IEEE Robotics and Automation Letters (RA-L), the International Journal of Social Robotics, Pattern Recognition Letters, and for Intelligent Service Robotics journal. She is the general chair of RO-MAN 2020 and RO-MAN 2022. Her research interests include Multi-agent Systems, Human-Robot Interaction, Cognitive Architectures, Behavior-based Robotics, and User Profiling and Recommender Systems.

Alessandro Di Nuovo, Professor of Machine Intelligence at Sheffield Hallam University, PI of the PERSEO network. He serves as the Topic Editor-in-Chief of the International Journal of Advanced Robotic Systems (Sage). He was Finance Chair of IEEE RO-MAN 2020 and 2022, Publication Chair of FUZZ-IEEE 2017, General Chair of 10th International Workshop on Hybrid Metaheuristics (HM 2016) and IEEE RO-MAN 2014 Workshop on New Frontiers of service robotics for elderly.

Angelo Cangelosi is a Professor of Machine Learning and Robotics at the University of Manchester (UK). He is a Turing Fellow at the Alan Turing Institute, a fellow of the British Computer Society and a senior member of the IEEE. He has produced more than 250 scientific publications and has been general/bridging chair of numerous workshops and conferences including the IEEE ICDL-EpiRob Conferences (Frankfurt 2011, Osaka 2013, Lisbon 2017, Tokyo 2018).

Gordon Cheng founded and holds the Chair for Cognitive Systems at the Technical University of Munich (TUM), Germany. He has made pioneering contributions in Humanoid Robotics, Neuroengineering, and AI for the past 20 years, is the co-inventor of approximately 20 patents and author of over 300 technical publications, proceedings, editorials, and book chapters. He was named IEEE Fellow in 2017 for his "contributions in humanoid robotic systems and neurorobotics".

8 ACKNOWLEDGMENTS

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