17-21 OCTOBER
AARHUS UNIVERSITY

WHAT SOCIAL ROBOTS CAN AND SHOULD DO

ROBOPHILOSOPHY 2016
TRANSOR 2016

AARHUS UNIVERSITY

PROGRAM

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WELCOME BY THE CONFERENCE ORGANIZERS

Dear participants of ROBOPHILOSOPHY 2016/ TRANSOR 2016,

We would like to welcome you to Aarhus University and—made possible by you—to the hitherto largest conference in Humanities research in and on social robotics!

In organizational terms, this meeting is a double conference—it is the second event in the biennial ROBOPHILOSOPHY conference series and the fourth event in the series of research meetings organized by the TRANSOR Research Network (Transdisciplinary Studies in Social Robotics). Two years ago, when we, as members of a small research group, organized the conference *Robo-Philosophy 2014 — Sociable Robots and the Future of Social Relations* (August 19-22, Aarhus University, Denmark), we hoped to be able to coin a concept that would open up a new line of research: "philosophy of, for, and by social robotics." We established a biennial conference series in Robophilosophy, scheduled to run into the 2020s in different locations. At the same time we joined forces with colleagues working on social robotics from the perspectives of other areas in the Humanities to create the TRANSOR network, at present listing 89 members. Since its beginning in 2015 the TRANSOR network so far organized in three international workshops: *Methodological Problems of Social Robotics* (Aarhus), *The Significance of Simulation* (Kolding) and *Social Robotics and Imagination* (Copenhagen).

The decision to combine Robophilosophy 2016 with a TRANSOR event was motivated by the requirements of the domain, social robotics, and the prospect of increased impact. Human Robot Interaction Studies (HRI) so far largely proceed without drawing on the expertise on socio-cultural interactions that Humanities research can offer. We felt that this was the right time to send out a strong signal that the rapid development of social robotics research and industry calls for a concerted and integrated effort across the disciplines of the Humanities to contribute to a better understanding of the transformative potentials of human-robot interaction.

The conference title alerts to the fact that in our current situation we cannot wait until we know what robots can do and then decide on what they should do. Rather, we need to keep descriptive and normative questions of social robotics in close vicinity. The normative questions of what social robots should do require a deeper and, in particular, a more comprehensive analysis of the facts of human-robot interaction than HRI so far has provided. What social robots should do we can best determine if our analysis of what they can do includes the methods and categories of human self-understanding, which belongs to the specific expertise of the Humanities.

To promote a new line of research is hard work and only possible as a joint effort. We would like to thank all those who have supported this enterprise and carried it further, especially our colleagues in the TRANSOR Steering Committee, Gunhild Borggreen, Kerstin Fischer, and Cathrine Hasse. Among those who made this conference possible we first want to thank you, the speakers and participants of this conference, and in particular also the organizers of our six conference workshops. We would like to thank our 'offsite' co-organizers, Gunhild Borggreen, Kerstin Fischer, and Cathrine Hasse, who provided valuable support throughout—during planning, announcement, and review. We are grateful to all additional members of our program committee and to all conference chairs for devoting their time and effort. We thank Vibeke Holm and Christina Vestergaard for energetically facilitating the art exhibition on "Children's Imagined Robots" by Victor van den Bergh and David Robert (including contributions by Cathrine Hasse). We would like to thank Gitte Grønning Munk and Ib Jensen at AU-Communication/Conference Support for help with many practical tasks, and their colleague Nikolai Lander for providing the conference with another striking graphical theme.

Particular acknowledgement is due to our conference staff manager Søren Schack Andersen, who also assisted us with great circumspection and efficiency in preparing the Proceedings and this program book. We thank our intern, Oliver Quick, for conference blogging and onsite interviews and all student conference staff members for agreeing to work during a vacation week. Finally, we would like to thank the Head of the School for Culture and Society, Bjarke Paarup, for his continuous moral support of our engagement for robophilosophy.

The conference was made possible by the financial support by the *Danish Research Council in the Humanities*, as well as—in the context of funding for two larger projects—the *Velux Foundation* (2012-2015) and the *Carlsberg Foundation* (2016-2021).

It is ironic that education and research in the Humanities are drastically reduced in some countries at a time when the voice of the Humanities is most needed to inform policy makers and to provide inspiration to robotics research and industry. Soon we may say: 'each country has the robots it deserves.' It is ironic that the politicians of some countries stress the significance of "cultural identity" in the migration debate or promise to "create new jobs" for unemployed youth at a time when it should be clear that the "robot revolution" threatens both, jobs and cultural values. The only route to *culturally sustainable robotics* is via a strengthening of Humanities research and its new link to robotics. Such political themes are not, as such, on the conference program but we are very glad that both of the two global networks of 'concerned researchers', the *Foundation for Responsible Robotics* (FRR) and the *Global Initiative for Ethical Considerations in Automated Information Systems* (IEEE) decided to participate with a research workshop, thereby creating explicitly a resonance space for the political and legislative implications of the research presented.

We very much hope that during the next five days we will jointly succeed in creating a meeting of (still exclusively human) minds that will clarify how we, in our theoretical and practical engagements, can live the "robotic moment" of human history which, as Sherry Turkle put it so felicitously, is not whether but "how we let robots into our lives and who we are willing to become."

We wish you a productive and pleasant stay in Aarhus!

Johanna Seibt and Marco Nørskov

OVERVIEW OVER CONFERENCE PROGRAM

MONDAY OCTOBER 17

11.00-13.00 Registration (Conference Foyer, Building 1441)

13.00-13.15 **Welcome**
Auditorium A

	Session 1: Methodological Issues I (Auditorium B)	Workshop 1: Artificial Empathy (Seminar Room A)
13.15-13.45	Kerstin Fischer: Robots as Confederates	Franco Molteni: Wearable Robotics and Gait Training after Stroke
13.45-14.15	Raya Jones: "If It's Not Broken, Don't Fix It?"	Nadia Berthouze: Affective Body Expression
14.15-14.45	Johanna Seibt: Integrative Social Robotics	Antonio Chella: Robots as Empathic Mediators

14.45-15.15 Coffee Break (Conference Foyer)

	Session 2: Ethical Tasks and Implications I (Auditorium B)	Workshop 1: Artificial Empathy (continued) (Seminar Room A)
15.15-15.45	Arto Laitinen et al: Social Robotics, Elderly Care, and Human Dignity	Lola Cañamero: Empathy and Embodied Affect in Autonomous Robots
15.45-16.15	Raul Hakli and Pekka Mäkelä: Robots, Autonomy, and Responsibility	Discussion
16.15-16.45	Nolen Gertz: The Master/iSlave Dialectic	

16.45-17.15 Reception (Conference Foyer, Building 1441)

17.15.-18.45 **Plenary 1: Noel Sharkey**
Human Responsibility in a World Full of Robots
Auditorium A

TUESDAY OCTOBER 18

08.30-09.00 Registration (Conference Foyer, Building 1441)

09.00-10.20 **Plenary 2: Christoph Bartneck**
Can Phronetic Robots be Engineered by Computational Logicians?
Auditorium A

10.20-10.40 Coffee Break (Conference Foyer, Building 1441)

10.40-12.00 **Plenary 3: Mark Coeckelbergh**
Is It Wrong to Kick a Robot?
Auditorium A

12.00-13.00 Lunch (Conference Foyer, Building 1441)

Session 3: Emotions in Human Robot Interactions
Auditorium B

13.00-13.30 Jaana Parviainen et al:
Motions with Emotions?

13.30-14.00 Eduard Fosch-Villaronga et al:
An Interdisciplinary Approach towards a Better Cognitive Human-Robot Interaction

14.00-14.30 Maike Klein:
Can Artificial Systems Have Genuine Emotions?

Workshop 3: Human-Robot Joint Action
Auditorium C

13.30-13.40 Aurélie Clodic:
Introduction

13.40-14.05 Francesca Bonalumi:
Psychological Foundations of Commitment

14.05-14.30 Raja Chatila:
Human-Robot Interaction

Workshop 2: Co-Designing Child-Robot Interactions
Seminar Room A

13.00-13.15 The Center for Children's Speculative Design:
Introduction

13.15-14.00 Victor van den Bergh, David Robert, and Nadezdha Zilberman:
Speculative Co-Design of Robots

14.00-14.30 Franziska Kirstein and Rikke Risager:
Experiences from Long-Term Implementation of Social Robots in Danish Educational Institutions

14.30-15.00 Coffee Break (Conference Foyer)

Session 4: Education, Art, and Innovation
Auditorium B

15.00-15.30 Eduard Fosch-Villaronga:
Robot Enhancement of Human Capabilities

15.30-16.00 Bojana Romic:
"Are You Talkin' to Me?"

16.00-16.30 Sofia Serholt et al:
Students' Normative Perspectives on Classroom Robots

Workshop 3: Human-Robot Joint Action (continued)
Auditorium C

15.00-15.25 Aurélie Clodic and Rachid Alami:
Commitment Management in Human-Robot Joint Action

15.25-15.50 John Michael:
The Sense of Commitment in Human-Robot Interaction

15.50-16.15 Henry Powell:
Commitment, Cooperation and Coordination in HRI

16.15-16.30 Panel Discussion

Workshop 2: Co-Designing Child-Robot Interactions (continued)
Seminar Room A

15.00-16.30 Group Activity:
Group Roboethics Imaginative Exercise using artwork from the Children's Imagined Robots exhibition

16.30-17.00 Reception (Conference Foyer, Building 1441)

17.00-18.20 **Plenary 4: John P. Sullins**
Artificial Phronesis and the Social Robot
Auditorium A

19.00-20.00 Reception at the Mayor's House of Aarhus

WEDNESDAY OCTOBER 19

08.30-09.00 Registration (Conference Foyer, Building 1441)

09.00-10.20 **Plenary 5: Selmer Bringsjord**
Can Phronetic Robots be Engineered by Computational Logicians?
Auditorium A

10.20-10.40 Coffee Break (Conference Foyer, Building 1441)

10.40-12.00 **Plenary 6: Jennifer Robertson**
Cyborg Able-ism and Recuperative Robotics: Forecasts from Japan
Auditorium A

12.00-13.00 Lunch (Conference Foyer, Building 1441)

	Session 5: Artificial Meaning and Rationality Auditorium B	Session 7: Methodological Issues II Auditorium C		Workshop 4: Robots in the Wild Seminar Room A
13.00-13.30	Ahti-Veikko Pietarinen: What Your Computer Still Can't Know	Elizabeth Jochum and Damith Herath: Robot Choreography	13.00-13.10	Cathrine Hasse: Welcome and Introduction
13.30-14.00	S.M. Amadae: Computation of Rational Action	Glenda Hannibal: Bringing the Notion of Everyday Life Back to the Center of Social Robotics and HRI	13.10-13.30	Christina Leeson: Did You Forget Your Feet at Home?
14.00-14.30	Martin M. Bentzen: The Principle of Double Effect Applied to Ethical Dilemmas of Social Robots	Luis de Miranda et al: We, Anthrobot	13.30-13.50	Lasse Blond: Travelling Robots and Their Cultural Baggage
			13.50-14.10	Birgitte Halle and Michelle Nielsen: Practical Experience by Using Robots
			14.10-14.30	Discussion and demonstration of the robots Nao and RETRAINER

14.30-15.00 Coffee Break (Conference Foyer)

	Session 6: Realizing Value-Oriented Design Auditorium B	Session 7: Methodological Issues II (continued) Auditorium C		Workshop 4: Robots in the Wild (continued) Seminar Room A
15.00-15.30	Raja Chatila and John C. Havens: Values By Design	Malene Damholdt et al: A Generic Scale for Assessment of Attitudes towards Social Robots	15.00-15.20	Mia Krogager Mathiasen: A Preview of Parenthood
15.30-16.00	Raja Chatila and John C. Havens: Values By Design (continued)	Sara Ljungblad et al: Are we Really Addressing the Human in Human-Robot Interaction?	15.20-15.50	Maja Hojer Bruun: A Place for Robots in Health Care Sociality?
16.00-16.30	Discussion	Lars C. Jensen: Using Language Games to Assess Engagement	15.50-16.10	Cathrine Hasse: Robot Learning
			16.10-16.30	Discussion and demonstration of the robots Nao and RETRAINER

16.30-16.50 Reception (Conference Foyer, Building 1441)

16.50-18.10 **Plenary 7: Kathleen Richardson**
Are Sex Robots as Bad as Killer Robots?
Auditorium A

19.00-22.30 Conference Dinner at the ARoS Museum Restaurant with performance by Grethe Mo - "Solaris Korrigert"

THURSDAY OCTOBER 20

08.30-09.00	Registration (Conference Foyer, Building 1441)		
09.00-10.20	Plenary 8: Amanda Sharkey Should We Place Robots in Social Roles? Auditorium A		
10.20-10.40	Coffee Break (Conference Foyer, Building 1441)		
10.40-12.00	Plenary 9: Simon Penny Robotics and Art, Computationalism and Embodiment Auditorium A		
12.00-13.00	Lunch (Conference Foyer, Building 1441)		
	Session 8: Social Norms and Robot Sociality Auditorium B	Session 9: Ethical Tasks and Implications II Auditorium C	Workshop 5: Artificial Phronesis Seminar Room A
13.00-13.30	Christian Brems and Anne Arnfred: The Third Space	Matthijs Smakman: Robots and Moral Obligation	Charles Ess: Introductory Remarks
13.30-14.00	Felix Lindner: How to Count Multiple Personal-Space Intrusions in Social Robot Navigation	Michael Funk: Tacit Security?	Shannon Vallor: Artificial Phronēsis as a Regulative Ideal in Robot Ethics
14.00-14.30	Arto Laitinen: Robots and Human Sociality	Myrthe van Nus: Social Robots, Privacy, and Ownership of Data	Mariarosaria Taddeo: Relying on Phronēsis to Understand Robot Ethics
14.30-15.00	Coffee Break (Conference Foyer)		
	Session 8: Social Norms and Robot Sociality (continued) Auditorium B	Session 9: Ethical Tasks and Implications II (continued) Auditorium C	Workshop 5: Artificial Phronesis (continued) Seminar Room A
15.00-15.30	Luciana Benotti and Patrick Blackburn: Polite Interactions with Robots	Yvette Pearson et al: The Ethical Impact of an Increased Presence of Robots on Human-Human Interaction (HHI) within Ageing Populations	Anne Gerdes: The Role of Phronēsis in Robot Ethics
15.30-16.00	Ingar Brinck et al: Robots, Social Norms and the Dynamics of Interaction	Filippo Santoni de Sio: Consent to the Use of Companionship Robots by Mentally Disordered Persons	Charles Ess: Phronēsis, Love, and "Complete Sex"
16.00-16.30	Marek Rosa: AI Roadmap Institute	Hin-Yan Liu: Structural Discrimination and Autonomous Vehicles: Immunity Devices	Discussion
16.30-17.00	Reception (Conference Foyer, Building 1441)		
17.00.-18.20	Plenary 10: Wendy Ju Power in Human Robot Interactions Auditorium A		

FRIDAY OCTOBER 21

08.30-09.00 Registration (Conference Foyer, Building 1441)

09.00-10.20 **Plenary 11: Domenico Parisi**
Robots That Have Free Will
Auditorium A

10.20-10.40 Coffee Break (Conference Foyer, Building 1441)

10.40-12.00 **Plenary 12: Benjamin Kuipers**
Why and How Should Robots Behave Ethically?
Auditorium A

12.00-13.00 Lunch (Conference Foyer, Building 1441)

Session 10: Perceptions of Social Robots
Auditorium B

13.00-13.30 Dennis Küster and Aleksandra Świderska:
Moral Patients

13.30-14.00 Maciej Musiał:
Magical Thinking and Empathy Towards Robots

14.00-14.30 Veronika Váňová:
Trust in Human-Robot Interaction

Workshop 6: Responsible Robotics
Auditorium C

13.00-13.20 Shannon Vallor:
Responsible Robotics and Moral Philosophy

13.20-13.40 Arto Laitinen et al:
Robotics and Philosophical Questions of Responsibility

13.40-14.00 Peter Asaro:
Responsibility and Liability in Increasingly Autonomous Agents

14.00-14.20 John Sullins:
Multilevel and Hidden Responsibility in Autonomous Systems

14.30-15.00 Coffee Break (Conference Foyer)

Session 10: Perceptions of Social Robots (continued)
Auditorium B

15.00-15.30 Nello Barile and Satomi Sugiyama:
I Am Her(e)

15.30-16.00 Hironori Matsuzaki:
Sense of Social Atmosphere (*Kūki*) and Robots That Should Read the Situation to Be Safe

16.00-16.30 Karolina Zawieska:
Human-Animal Analogy in Human-Robot Interaction

Workshop 6: Responsible Robotics (continued)
Auditorium C

15.00-15.20 Michael Nagenborg:
Urban Robotics and Responsible Urban Innovation

15.20-15.40 Deborah G. Johnson and Astrid Gynnild:
Responsible Flying Camera Robots and the Media

15.40-16.00 Peter Novitzky:
Present and Future Impact of Drones

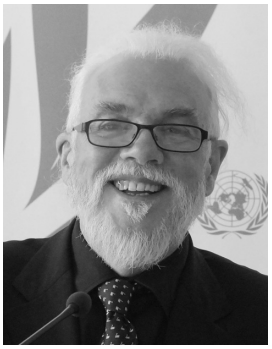
16.00-16.20 Alan Winfield:
Ethical Governance is needed to build Trust

16.30-17.00 Reception (Conference Foyer, Building 1441)

17.00.-18.20 **Plenary 13: David Gunkel**
Other Problems
Auditorium A

PLENARY LECTURES

NOEL SHARKEY



Name Noel Sharkey, Professor Emeritus

Affiliation **AI and Robotics University of Sheffield, UK**

Title Human Responsibility in a World Full of Robots

Session Plenary Talk 1

Time and location Monday, October 17, 17:15-18:45; Auditorium A

Abstract

Robots are increasingly moving out of the factories to automate many aspects of our daily lives. In 2014 alone, 4.7 million robots were sold for personal and domestic use with the figure predicted to rise to 35 million by 2018. Yet we appear to be rushing into this robot revolution without due consideration being given to the many unforeseen problems lying around the corner. It is difficult for policy makers and legislators to keep up with the rapidly emerging developments. So it is vitally important that the scientists, researchers and manufacturers develop a socially responsible attitude to their work and are willing to speak out. This talk will consider some of the societal dangers and open a discussion about how we can keep the dream of beneficial robots while avoiding the nightmares.

About the speaker

Noel Sharkey PhD DSc FIET FBCS CITP FRIN FRSA Emeritus Professor of AI and Robotics University of Sheffield, co-director of the Foundation for Responsible Robotics http://responsiblerobotics.org and chair elect of the NGO: International Committee for Robot Arms Control (ICRAC) http://icrac.net. He has moved freely across academic disciplines, lecturing in departments of engineering, philosophy, psychology, cognitive science, linguistics, artificial intelligence, computer science, robotics, ethics, law, art, design and military colleges. He has held research and teaching positions in the US (Yale and Stanford) and the UK (Essex, Exeter and Sheffield).

Noel has been working in AI/robotics and related disciplines for more than 3 decades and is known for his early work on neural computing and genetic algorithms. As well as writing academic articles, he writes for national newspapers and magazines. Noel has created thrilling robotics museum exhibitions and mechanical art installations and he frequently appears in the media. His research since 2006 has been on ethical/legal/human rights issues in robot applications in areas such as the military, child care, elder care, policing, autonomous transport, robot crime, medicine/surgery, border control, sex and civil surveillance. Much of his current work is advocacy (mainly at the United Nations) about the ethical, legal and technical aspects of autonomous weapons systems.

CHRISTOPH BARTNECK

Name

Christoph Bartneck, Assoc. Professor

Affiliation

Human Interface Technology Laboratory New Zealand,
University of Canterbury, NZ

Title

How human are robots and how robotic are humans?

Session

Plenary Talk 2

Time and location

Tuesday, October 18, 09:00-10:20; Auditorium A

Abstract

Robots are being perceived as human-like and the borderline between what is a human and what is a robot becomes increasingly blurred. I will present several studies that try to explore the boundaries between what we dare to do with robots and humans.

About the speaker

Dr. Christoph Bartneck is an associate professor and director of postgraduate studies at the HIT Lab NZ of the University of Canterbury. He has a background in Industrial Design and Human-Computer Interaction, and his projects and studies have been published in leading journals, newspapers, and conferences. His interests lie in the fields of Social Robotics, Design Science, and Multimedia Applications. He has worked for several international organizations including the Technology Centre of Hannover (Germany), LEGO (Denmark), Eagle River Interactive (USA), Philips Research (Netherlands), ATR (Japan), Nara Institute of Science and Technology (Japan), and The Eindhoven University of Technology (Netherlands). Christoph is a member of the New Zealand Institute for Language Brain & Behavior, the IFIP Work Group 14.2 and ACM SIGCHI.

MARK COECKELBERGH

Name Mark Coeckelbergh, Professor

Affiliation Department of Philosophy, University of Vienna, AT

Title **Is it wrong to kick a robot? Towards a relational and critical robot ethics and beyond**

Session Plenary Talk 3

Time and location Tuesday, October 18, 10:40-12:00; Auditorium A

Abstract

Some robots seem to invite either empathy and desire or "violent" behaviour and "abuse". This raises a number of questions. We can try to understand what is happening in such cases, which seem puzzling at first sight, given that these robots were supposed to be, and designed as, machines - "social" robots since they interact with humans but machines nevertheless. We can also conceptualize the problem in terms of the moral status of the robot and what the human ought (not) to do with the robot.

A different approach to robot ethics is explored which is critical of the moral language used in these discussions and which can cope with - or even requires – destabilization and uncertainty with regard to the moral status of entities. This approach thus questions the very question regarding moral status and ontological classification.

It acknowledges the violence that is done by theory and classification and redirects our moral attention to the encounter, the visit, and the collaboration. It asks us to take seriously the moral experience of humans as embodied and social-relational beings who respond to other entities in ways that cannot readily be captured by rigid moral or ontological categories, and indeed live their lives in ways that will always resist classification, reasoning, and binary and algorithmic thinking about right and wrong. Given the limits of the moral and theoretical word, therefore, it is necessary for robophilosophy to sometimes bracket normative and textual efforts and learn from, and engage in, anthropological and artistic research on humans and their relation to other entities.

About the speaker

Mark Coeckelbergh is Professor of Philosophy of Media and Technology at the Philosophy Department of the University of Vienna, and (part-time) Professor of Technology and Social Responsibility at De Montfort University, UK. Previously he was Managing Director of the 3TU Centre for Ethics and Technology. His publications include Growing Moral Relations (2012), Human Being @ Risk (2013), Environmental Skill (2015), Money Machines (2015) and numerous articles in the area of philosophy of technology, in particular the philosophy and ethics of robotics and ICTs.

JOHN P. SULLINS

Name John P. Sullins, Professor

Affiliation Department of Philosophy, Sonoma State University, US

Title **Artificial Phronesis and the Social Robot**

Session Plenary Talk 4

Time and location Tuesday, October 18, 17:00-18:20; Auditorium A

Abstract

The problem of artificial phronesis is one that has to be solved by the designers of social robots—otherwise their project to bring robots into our daily lives will fail. At its core, phronesis is a term used by Aristotle to describe the skill some people have for using practical reasoning to navigate the ethics of social interactions with proficiency and excellence. Phronesis is an ability that most humans have but it is also one that requires practice to master. Once attained this skill is used by an ethical agent to assess the appropriately virtuous actions one might take in a given social situation. It is a skillful practice that requires the discernment of the nuances involved in any real-life situation. Since any real-life situation of consequence is one that is encountered only once in a person's lifetime, there is no information from past actions or situations that will be wholly sufficient for deducing a proper reaction.

Social robots have only their programing and machine learning to rely on for deducing their reactions to any given social situation. If phronesis is a real ability humans have and it is not something that can be programed or learned simply form past experience, then the social robot's lack of that capacity will be an insurmountable barrier to the machine's ability to enter into meaningful relations with human agents.

We will explore this problem and look at a possible solution inspired by the philosopher John Dewey where he expands on Aristotle's conception of phronesis. If he is successful, then phronesis would not be the exclusive capacity of human agents, but other kinds of agents might be capable of it as well. Might that expanded set of agents include social robots? Let's find out

About the speaker

John P. Sullins is a professor of philosophy at Sonoma State University in California where he has taught since 2004. He is the 2011 recipient of the Herbert Simon Excellence in Research award from the International Association of Computers and Philosophy and he regularly publishes on the topics of the philosophical implications of military and personal robotics technologies.
Website: https://sonoma.academia.edu/JohnSullins

SELMER BRINGSJORD

Name Selmer Bringsjord, Professor

Affiliation Cognitive Science Department, Rensselaer Polytechnic Institute, US

Title **Can Phronetic Robots be Engineered by Computational Logicians?**

Session Plenary Talk 5

Time and location Wednesday, October 19, 09:00-10:20; Auditorium A

Abstract

Confronted with a moral dilemma, a phronetic robot is one that navigates in this situation to a decision (and corresponding action) on the basis of /phronesis/ --- that is, on the basis of a form of wise, practical reasoning that, at its heart, is holistic, affective, balanced, and creative. So, can phronetic robots be engineered by computational logicians? Obviously the question, given only the foregoing, is premature, for the stark reason that such engineering requires, by definition, logico-mathematical formalization, and the h-a-b-c list is patently /in/formal. Turning to Aristotle and Kant, both of whom can be viewed as giving a version of /phronesis/ in line with the h-a-b-c skeleton, and to my own Leibnizian account, I venture initial formalization sufficient to enable a two-part answer to the driving question: viz., "(1) No. (2) But, a /zombie/ phronetic robot /can/ beengineered, in fact right in my lab, as the following videos show."

About the speaker

Selmer Bringsjord specializes in building AI systems and robots with human-level powers, and in the philosophical and logico-mathematical foundations of AI, where such questions as to whether a machine with super-human intelligence could ever be engineered, are addressed. At the present conference at Aarhus, the key question to be addressed by him is whether a robot having the moral virtue of a "saintly" human can be engineered. Bringsjord is the author of numerous publications, most of which are offered at www.rpi.edu/~brings, where his full cv is available.

JENNIFER ROBERTSON

Name Jennifer Robertson, Professor

Affiliation Departments of Anthropology and the History of Art
University of Michigan, US

Title **Cyborg Able-ism and Recuperative Robotics: Forecasts from Japan**

Session Plenary Talk 6

Time and location Wednesday, October 19, 10:40-12:00; Auditorium A

Abstract

I explore and interrogate the development and application in Japan--with cross-cultural comparisons--of robotic prosthetic devices that effectively transform disabled persons into cyborgs. Cyborgs or bio-machines, are arguably a type of "social robot." The impetus for the development of robotic prostheses, and, by extension, the valorization of what I term "cyborg able-ism," grew out of national and international initiatives, such as the Paralympics, to improve the lives of persons with mobility disabilities of various origins. The majority of prosthetics engineers and manufacturers in Japan create "natural looking" artificial limbs that enable disabled individuals to "pass" as bodies without physical disabilities. However, "natural looking" is not the same as "natural functioning," and as I argue, prosthetics that most closely duplicate limb and body movements may not look at all like the missing limb(s). My paper focuses on both the anthropological and the phenomenological dimensions of cyborg-ableism. Specifically, I both examine the types of human bodies that are privileged in the discourse of machine-enhanced mobility, and analyze the modes of sociality, and attendant social structures, that robotic devices and prosthetics are imagined to recuperate.

About the speaker

Jennifer Robertson is Professor of Anthropology and the History of Art at the University of Michigan, Ann Arbor. She is a former director, and current director of graduate studies, of the Center for Japanese Studies, and a faculty associate in the Science, Society and Technology Program, among others. Robertson earned her Ph.D. in Anthropology from Cornell University in 1985, where she also earned a B.A. in the History of Art in 1975. The author of several books and over seventy articles, her new book, Robo sapiens japanicus: Robots, Eugenics, and Posthuman Aesthetics, is forthcoming from the University of California Press. www.jenniferrobertson.info

KATHLEEN RICHARDSON

Name Kathleen Richardson, Senior Research Fellow

Affiliation The Ethics of Robotics at the Centre for Computing and Social Responsibility, De Montfort University, UK

Title **Are sex robots as bad as killer robots?**

Session Plenary Talk 7

Time and location Wednesday, October 19, 16:50-18:10; Auditorium A

Abstract

In 2015 the Campaign Against Sex Robots was launched to draw attention to the technological production of new kinds of objects: sex robots of women and children. The campaign was launched shortly after the Future of Life Institute published an online petition: "Autonomous Weapons: An Open Letter From AI and Robotics Researchers" which was signed by leading luminaries in the field of AI and Robotics. In response to the Campaign, an academic at Oxford University opened an ethics thread "Are sex robots as bad as killer robots ?" writing 'I did sign FLI's [Future of Life Institute] open letter advocating a ban on autonomous weapons. I would not sign a similar letter arguing for a ban on sex robots.' Are sex robots really an innocuous contribution to the robotics industry and human relations that we should not worry about? And to what extent would challenging sex robots threaten male power and sexuality with males the primary buyers of women and children's bodies? Robotics and AI are fields overwhelming dominated by men, how does the politics of gender shape what technologies are considered ethically problematic or permissible? This talk will examine these themes.

About the speaker

Dr Kathleen Richardson is a Senior Research Fellow in the Ethics of Robotics at the Centre for Computing and Social Responsibility and part of the DREAM Project exploring robot enhanced technologies for children with autism.
Kathleen completed her PhD at the Department of Social Anthropology, University of Cambridge. Her fieldwork was an investigation of the making of robots in labs at the Massachusetts Institute of Technology. After her PhD she was a British Academy Postdoctoral Fellow, a position she held at the University College London's Department of Anthropology. Her postdoctoral work was an investigation into the therapeutic uses of robots for children with autism spectrum conditions. At De Montfort University she has initiated a research initiative called Freedom Ethics and Technology, which examines how ideas about freedom are constructed through sex, technology, free speech and narratives of free subjectivity.

AMANDA SHARKEY

Name Amanda Sharkey, Assoc. Professor

Affiliation Department of Computer Science, University of Sheffield, UK

Title **Should we place robots in social roles?**

Session Plenary Talk 8

Time and location Thursday, October 20, 09:00-10:20; Auditorium A

Abstract

Great progress has been made in the development of social robots that can interact with us in entertaining and sometimes useful ways, and that appear to understand us. It has been suggested that robots could be placed in social roles such as those of children's nannies, or teachers, or as carers and companions of older people. Before this happens, we must look at the available evidence and consider the likely effects. I will identify and discuss the ethical concerns that robots give rise to in different scenarios, as well as the potential benefits, focusing on those that involve the more vulnerable members of society. There is a pressing need to be aware of the risks of trusting robots too much and placing them in roles that they cannot adequately fulfill.

About the speaker

Amanda Sharkey is a Senior Lecturer (Associate Professor) in the Department of Computer Science, University of Sheffield, a member of Sheffield Robotics, and on the executive board of the Foundation for Responsible Robotics. She comes from an interdisciplinary background. After a first degree in Psychology, she held a variety of research positions at University of Exeter, MRC Cognitive Development Unit, and Yale and then Stanford, USA. She completed her PhD in Psycholinguistics in 1989 at University of Essex. Since then she conducted research in neural computing at University of Exeter, before moving to University of Sheffield. Her current research interests are in robot ethics, particularly the ethics of robot care, and human-robot interaction. Amanda has over 90 publications. She was a founding member of the scientific committee for an international series of workshops on Multiple Classifier Systems and was the editor of the journal Connection Science (now associate editor) and is a member of IET.

SIMON PENNY

Name Simon Penny, Professor

Affiliation Studio Art, University of California, US

Title **Robotics and Art, Computationalism and Embodiment**

Session Plenary Talk 9

Time and location Thursday, October 20, 10:40-12:00; Auditorium A

Abstract

Robotic Art and related practices provide a context in which real-time computational technologies and techniques are deployed for cultural purposes. This practice brings the embodied experientiality, (so central to art) hard up against the tacit commitment to abstract disembodiment inherent in the computational technologies. In this essay I explore the relevance of post-cognitivist thought to robotics in general, and in particular, questions of materiality and embodiment with respect to robotic art practice – addressing philosophical, aesthetic-theoretical and technical issues.

About the speaker

Simon Penny has worked at the intersections of computing and the arts for 30 years, building interactive systems that attend to embodied experience and gesture. In artistic and scholarly work he explores problems encountered when machines for abstract mathematico-logical procedures are interfaced with cultural practices (such as aesthetic creation and reception) whose first commitment is to the engineering of persuasive perceptual immediacy and affect. His current book project Making Sense – Art, Computing, Cognition and Embodiment focuses on articulating new aesthetics based in contemporary embodied and post-cognitivist perspectives.

WENDY JU

Name

Wendy Ju, Executive Director (1) & Associate Professor (2)

Affiliation

(1) Interaction Design Research at the Center for Design Research at Stanford University, US
(2) Interaction Design in the Design MFA program at California College of the Arts, US

Title

Power in Human Robot Interactions

Session

Plenary Talk 10

Time and location

Thursday, October 20, 17:00-18.20; Auditorium A

Abstract

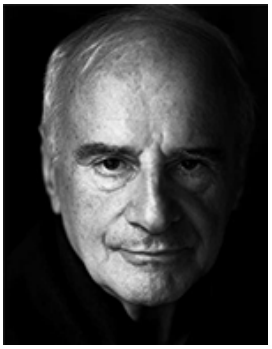
Since the very inception of robotics, the specter of robot power has been a central concern in human-robot relations. In science fiction books, plays and movies, the prospect of these mechanical servants becoming robot overlords is a recurring theme. The concerns about robot labor, about robot power, about the relative social status of robots speak metaphorically to concerns about loss of control and the ways in which technology disrupts the social structures and institutions in our lives. As robotics progress from science fiction to day-to-day reality, the drama of power and status in the human-robot will begin to enter our everyday lives. While much attention has been focused on the people who would be displayed by automated agents, not much thought has been paid to what the effects of robots will be on the people who work around robots, with robots and on robots.

Research in the space of human-robot interactions indicate that people are as sensitive to the social dynamics of power between people and robots as they are to the dynamics between people--perhaps more. Drawing examples from my own research and that of others, I illustrate how the dynamics of structure, class and power affect people's expectations for machines, present design guidelines that emerge from research findings, and consider some of the moral and philosophical implications of robot power.

About the speaker

Dr. Wendy Ju is Executive Director for Interaction Design Research at the Center for Design Research at Stanford University, and Associate Professor of Interaction Design in the Design MFA program at California College of the Arts. Her work in the areas of human-robot interaction and automated vehicle interfaces highlights the ways that interactive devices can communicate and engage people without interrupting or intruding. She has innovated numerous methods for early-stage prototyping of automated systems to understand how people will respond to systems before the systems are built. She has a PhD in Mechanical Engineering from Stanford, and a Master's in Media Arts and Sciences from MIT. Her monograph on The Design of Implicit Interactions was published in 2015.

DOMENICO PARISI



Name Domenico Parisi, Ph.D

Affiliation Institute of Cognitive Sciences and Technologies, National Research Council, IT

Title **Robots that have free will**

Session Plenary Talk 11

Time and location Friday, October 21, 09:00-10:20; Auditorium A

Abstract

Robots that resemble human beings can have practical applications (humanoid robots) or they can be a new science of human beings that will allow science to understand human beings as it understands everything else (human robots). While humanoid robots physically resemble human beings and do only a few things that human beings do, human robots must do everything that human beings do and, since human beings have free will, human robots must have free will, and my talk will describe the first steps towards the construction of robots that have free will. We must begin by recognizing that the most important difference between humanoid robots and human robots is that, while humanoid robots must do what we want them to do, human robots must do what they want to do. Robots that have free will are robots with an artificial brain, which is able to predict the consequences of their actions before actually executing the actions. In addition, robots that have free will must possess a human-like language with which they can use to talk to other robots and use to articulate and reason about the consequences of their actions. Living with robots that have free will, either physically realized or simulated in a computer, will pose more serious problems to human beings than living with today's robots. In fact, in the future human beings will be confronted with a very difficult choice: either accepting to deal with these problems or renouncing to understand themselves as science understand everything else.

About the speaker

Domenico Parisi got a BA in philosophy at the University of Rome, a MA in psychology at the University of Illinois, Urbana, and a PhD in psychology at the University of Rome. He has taught in various Italian Universities and at the University of California, Berkeley. Currently, he does research at the Institute of Cognitive Sciences and Technologies, National Research Council, Rome, where he constructs simulated robots that must progressively do everything that human beings do. Most of this work is described in his book "*Future Robots. Towards a Robotic Science of Human Beings*" (Amsterdam, Benjamins, 2014)

BENJAMIN KUIPERS

Name Benjamin Kuipers, Professor

Affiliation Computer Science & Engineering, University of Michigan, US

Title **Why and How Should Robots Behave Ethically?**

Session Plenary Talk 12

Time and location Friday, October 21, 10:40-12:00; Auditorium A

Abstract

Robots and other AIs are becoming increasingly numerous, and they are increasingly acting as members of our society. They perform tasks that sometimes present difficult and time-critical choices. How should robots and AIs make morally and ethically significant choices? The standard notion of rationality in artificial intelligence, derived from game theory, says that a rational agent should choose the action that maximizes its expected utility. In principle, "utility" can be very sophisticated, but in practice, it typically means the agent's own reward. Unfortunately, scenarios like the Tragedy of the Commons and the Prisoner's Dilemma show that self-interested reward-maximization can easily lead to very poor outcomes both for the individual and for society.

As a step toward resolving this problem, we ask what are the pragmatic benefits of acting morally and ethically, both for individuals and for society as a whole. Recent results in the cognitive sciences shed light on how humans make moral and ethical decisions. Following ethical and moral constraints often leads both the individual and the society as a whole to reap greater benefits than would be available to self-interested reward-maximizers.

Based on the human model, we can begin to define a decision architecture by which robots and AIs can judge the moral and ethical properties of proposed or observed actions, and can explain those judgments and understand such explanations, leading to feedback cycles at several different time-scales.

About the speaker

Benjamin Kuipers is a Professor of Computer Science and Engineering at the University of Michigan. He previously held an endowed Professorship in Computer Sciences at the University of Texas at Austin. He received his B.A. from Swarthmore College, and his Ph.D. from MIT. He investigates the representation of commonsense and expert knowledge, with particular emphasis on the effective use of incomplete knowledge. His research accomplishments include developing the TOUR model of spatial knowledge in the cognitive map, the QSIM algorithm for qualitative simulation, the Algernon system for knowledge representation, and the Spatial Semantic Hierarchy models of knowledge for robot exploration and mapping. He has served as Department Chair at UT Austin, and is a Fellow of AAAI, IEEE, and AAAS.

DAVID GUNKEL

Name David Gunkel, Professor

Affiliation Department of Communication, Northern Illinois University, US

Title **Other Problems: Rethinking Ethics in the Face of Social Robots**

Session Plenary Talk 13

Time and location Friday, October 21, 17:00-18:20; Auditorium A

Abstract

In this presentation, I will 1) review and critically assess the three responses that have typically been offered to contend with the unique status and situation of social robots: a) strict application of the instrumental theory of technology, b) proposals for a vindication of the rights of machines or robot ethics, and c) various hybrids of these two positions with names like "actor network theory" and the "ethics of things." 2) In the process, I will demonstrate how all three formulations, despite considerable promise and support, fail to provide a sustainable account that can scale to the unique opportunities and challenges of social robots. 3) Finally, and in response to this demonstrated failure, I will conclude by formulating a fourth alternative that does not seek to resolve the existing debate by identifying some common ground or brokering a deal between competing factions but by working to undermine and collapse the shared philosophical assumptions that all three positions already endorse and operationalize from the outset. The objective of the effort, therefore, is not simply to criticize the application of existing mode of thinking to social robotics, but also to use social robots as an occasion and opportunity to do some important and much needed reflection on the current state and configuration of moral philosophy.

About the speaker

David J. Gunkel (PhD, DePaul University, USA) is Distinguished Teaching Professor of Communication Technology at Northern Illinois University (USA). He is the author of seven books, including Thinking Otherwise: Philosophy, Communication, Technology (Purdue University Press, 2007), The Machine Question: Critical Perspectives on AI, Robots and Ethics (MIT Press, 2012), and Of Remixology: Ethics and Aesthetics After Remix (MIT Press, 2016). Dr. Gunkel has taught, lectured, and delivered award-winning papers throughout North and South America and Europe and is the founding co-editor of the International Journal of Žižek Studies and the Indiana University Press book series Digital Game Studies. More information can be obtained from gunkelweb.com

SESSION TALKS

KERSTIN FISCHER

Name Kerstin Fischer, Professor MSO

Affiliation University of Southern Denmark, Denmark

Title **Robots as Confederates:**
How Robots Can and Should Support Research in the Humanities

Session Session 1: Methodological Issues I

Time and location Monday, October 17, 13:15-13:45; Auditorium B

Abstract This paper addresses the use of robots in experimental research for the study of human language, human interaction, and human nature. It is argued that robots make excellent confederates that can be completely controlled, yet which engage human participants in interactions that allow us to study numerous linguistic and psychological variables in isolation in an ecologically valid way. Robots thus combine the advantages of observational studies and of controlled experimentation.

About the speaker Kerstin Fischer is professor (MSO) for Language and Technology Interaction at the University of Southern Denmark. She received her PhD in English Linguistics from Bielefeld University in 1998, after which she did postdoctoral work at the University of Hamburg on emotion in human-computer interaction. She was assistant professor in Bremen 2000-2006 and associate professor for English Linguistics at the University of Southern Denmark 2007-2015. Her research focuses on the verbal interaction between humans and robots, her most important concern being how interaction succeeds, what mechanisms and processes are involved, what robot behaviors human users easily adapt to, what behaviors robots should be endowed with and how human-like these behaviors have to be.

RAYA A. JONES

Name Raya A. Jones, Dr.

Affiliation School of Social Science, Cardiff University, United Kingdom

Title **"If It's Not Broken, Don't Fix It?"**
An Inquiry Concerning the Understanding of Child-Robot Interaction

Session Session 1: Methodological Issues I

Time and location Monday, October 17, 13:45-14:15; Auditorium B

Abstract Ethical standpoints regarding robots for children are polarized, yet there is insufficient evidence to substantiate either position. This is compounded by the multiplicity of lenses through which child-robot interactions are investigated. This paper explores implications for translating knowledge from robotics to developmental psychology. The concept of a 'care-receiving robot' is a case in point, favorably reviewed here though the manner of its testing discloses the need for a conceptual framework that takes into robotics, processes of child development, sociocultural expectancies about optimal development, and factors affecting research priorities.

About the speaker Raya Jones, Reader, teaches developmental psychology and personality studies. Her primary interests are theories of the self, identity and personhood. This has to her latest book, *Personhood and Social Robotics* (Routledge, 2016). Previous work centre on Jungian, narrative and dialogical perspectives, and earlier work investigated child mental health in school settings. Other books include *Jung, Psychology, Postmodernity* (Routledge, 2007), *The Child-School Interface* (Cassell, 1995), and several edited volumes.

JOHANNA SEIBT

Name Johanna Seibt, Professor MSO

Affiliation Research Unit for Robophilosophy, Department of Philosophy and the History of Ideas, Aarhus University, Denmark

Title

"Integrative Social Robotics"
A New Method Paradigm to Solve the Description Problem And the Regulation Problem?

Session Session 1: Methodological Issues I

Time and location Monday, October 17, 14:15-14:45, Auditorium B

Abstract

I will sketch the basic motivations for "Integrative Social Robotics" (ISR), a new paradigm for how to approach research, design, and development of social robotics applications that are culturally sustainable. I argue that social robotics saddles us with normative-regulatory and descriptive questions that currently are kept too far apart. Currently HRI research investigates what social robots can do and robo-ethicists deliberate afterwards what robots should do. However, given the rapid pace of the robotics industry, descriptive and regulatory questions must be treated in combination. On the ISR approach research in social robotics turns on what social robots can and should do--design and development are from the very beginning informed by value-theoretic and cultural research. ISR thus is a form of research organization that integrates robotics with empirical, conceptual, and value-theoretic research in the Humanities, the Social Sciences, and the Human Sciences. The resulting paradigm is user-driven design writ large: research, design, and development of social robotics applications are guided—with multiple feedback—by the reflected normative preferences of a cultural community.

About the speaker

JS has published widely in analytical (process) ontology; since 2011 she also works in "robophilosophy," with focus on the ontology of human-robot interaction (see "Towards an Ontology of Simulation – Varieties of the As-If" (2016, uploaded on academia.edu). She is coordinator of the Research Unit for Robophilosophy (since 2012, formerly called PENSOR group), and currently leads a project on "Integrative Social Robotics" supported by the Carlsberg Foundation, involving an international team of 25 researchers. Together with M. Nørskov she organizes the Robophilosophy conference series. Editions (with R. Hakli and M. Nørskov): *Robophilosophy 2014: Sociable Robots and the Future of Social Relations* (IOS Press 2014), *Robophilosophy 2016 – What Social Robots Can and Should Do* (IOS Press 2016), *Robophilosophy – Philosophy of, for, and by Social Robotics* (MIT Press (in preparation, to appear 2017).

ARTO LAITINEN (ET AL.)

Names

Arto Laitinen, Professor;
Marketta Niemelä, Senior Scientist;
Jari Pirhonen, Researcher.

Affiliation

School of Social Sciences and Humanities, University of Tampere, Finland

Title

Social Robotics, Elderly Care, and Human Dignity: A Recognition-theoretical Approach

Session

Session 2: Ethical Tasks and Implications I

Time and location

Monday, October 17, 15:15-15:45; Auditorium B

Abstract

Attitudes towards robots in elderly care are systematically sceptical: a central worry is that a robot caretaker will rob the elderly of their human contacts. Are such worries justified? Will robotics change something relevant concerning the human dignity of elders? Are some specific robots especially dubious, or can robotics, as a generic technology, change the practices of care so that human dignity would be under threat? In this paper, we ask what human dignity entails in elderly care, and what kinds of threats and possibilities social robotics may bring with it. Earlier studies have approached this question, for example, in light of the capability theories of human life, consistent with human dignity. Our starting point are theories of recognition of persons, which have distinguished three main kinds of needs for recognition: the need for respect as a person, the need to feel esteemed as a contributor to the common good, and the need to be loved.

About the speakers

Arto Laitinen is Professor in Social Philosophy at University of Tampere, co-editor of the *Journal of Social Ontology,* and vice director of the multidisciplinary project *Robots and the Future of Welfare Services* (ROSE) funded by the Strategic Research Council (SRC) of the Academy of Finland. Dr. Marketta Niemelä is Senior Scientist at VTT Technical Research Center of Finland with projects on service robots and human-robot interaction for elderly care and public places. Jari Pirhonen, MSSc, is a doctoral student, University of Tampere, School of Health Sciences Gerontology Research Center, working on the well-being of the elderly in long-term care.

RAUL HAKLI AND PEKKA MÄKELÄ

Names

Raul Hakli, postdoctoral researcher;
Pekka Mäkelä, coordinator.

Affiliation

Academy of Finland Centre of Excellence for the Philosophy of the Social Sciences (TINT), Department of Political and Economic Studies, University of Helsinki, Finland

Title

Robots, Autonomy, and Responsibility

Session

Session 2: Ethical Tasks and Implications I

Time and location

Monday, October 17, 15:45-16:15; Auditorium B

Abstract

We study whether robots can satisfy the conditions for agents fit to be held responsible in a normative sense, with a focus on autonomy and self-control. An analogy between robots and human groups enables us to modify arguments concerning collective responsibility for studying questions of robot responsibility. On the basis of Alfred R. Mele's history-sensitive account of autonomy and responsibility it can be argued that even if robots were to have all the capacities usually required of moral agency, their history as products of engineering would undermine their autonomy and thus responsibility.

About the speakers

Raul Hakli and Pekka Mäkelä work at the Academy of Finland Centre of Excellence for the Philosophy of the Social Sciences (TINT) at the Department of Political and Economic Studies, University of Helsinki, Finland. Their interests include collective intentionality, social ontology, collective responsibility, and philosophy of social robotics.

NOLEN GERTZ

Name Nolen Gertz, Assistant Professor of Applied Philosophy

Affiliation University of Twente, The Netherlands

Title **The Master/iSlave Dialectic: Post (Hegelian) Phenomenology and the Ethics of Technology**

Session Session 2: Ethical Tasks and Implications I

Time and location Monday, October 17, 16:15-16:45; Auditorium B

Abstract In part one of this paper I turn to Don Ihde to show how a technological object can occupy the role that "the other" plays for Hegel in his phenomenology as the structural features of Hegel's analyses of self-other relations can be found in Ihde's analyses of human-technology relations. I then turn to Singer's Wired for War and Gertz's Philosophy of War and Exile. These texts show how the way soldiers treat robots by naming them, protecting them, and by even risking their lives to save them, illustrates Hegel's central claim: ethical life develops based on the process of discovering that to recognize others (whether human or technological) is to recognize ourselves and that to misrecognize others is to misrecognize ourselves. I conclude by offering suggestions as to how this understanding of ethical life as based on recognition and misrecognition can be applied to design ethics.

About the speaker Nolen Gertz is the author of *The Philosophy of War and Exile: From the Humanity of War to the Inhumanity of Peace* (Palgrave, 2014). He is the coordinator of the 4TU.Centre for Ethics and Technology's Task Force on Risk, Safety, and Security, as well as a Research Associate in Military Ethics at the Inamori International Center for Ethics and Excellence at Case Western Reserve University. His research interests include applied ethics, social and political philosophy, phenomenology, existentialism, and aesthetics.

JAANA PARVIAINEN (ET AL.)

Names

Jaana Parviainen, Senior Researcher
Lina Van Aerschot, Postdoc Researcher
Tuomo Särkikoski, Senior Researcher
Satu Pekkarinen, Senior Researcher
Helinä Melkas, Professor
Lea Hennala, Senior Researcher

Affiliation

School of Social Sciences and Humanities/Philosophy, University of Tampere, Finland

Title

Motions with Emotions?

Session

Session 3: Emotions in Human Robot Interactions

Time and location

Tuesday, October 18, 13:00-13:30; Auditorium B

Abstract

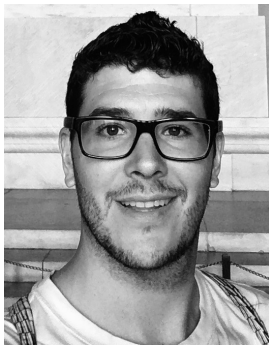
This paper seeks to answer the question of how the interactive capabilities of social robots are related to their embodied character. Contributing to the discussions on the role of physical appearance in robotics, we apply a phenomenological theory of the body to develop a new understanding of the robot body. Drawing on Edmund Husserl's phenomenological distinction between the material and the lived body, we consider the robot body as "double" since it entails both objective and subjective aspects. We assume that the expressivity of "double bodies" can be seen as central in understanding the phenomenon of aliveness in social robots.

About the speaker

Dr. Jaana Parviainen received her doctorate in philosophy from the University of Tampere. Her research interests include phenomenology and social epistemology especially relating to embodiment, movement and digital technology in the post-industrial economy. Her recent publications include "Quantified Bodies in the Checking Loop: Analysing the Choreographies of Biomonitoring and Generating Big Data (*Human Technology* 12,1, pp. 56–73, 2016) and "The Performativity of 'Double Bodies': Exploring the Phenomenological Conception of *Leib/Körper* Distinction in Interactive Bodywork (*The International Journal of Work Organisation and Emotion* 6,4, pp. 311-326, 2014).

All authors of the paper, Parviainen, Van Aerschot and Särkikoski from University of Tampere and Pekkarinen, Melkas and Hennala from Lappeenranta University of Technology, are currently involved in the research project "Robots and the Future of Welfare Services" (ROSE). Their collaborative research focuses on service robots in eldercare.

EDUARD FOSCH VILLARONGA (ET AL.)



Names

Eduard Fosch Villaronga, Ph.D. Student. (1)
Alex Barco (2)
Beste Özcan (3)
Jainendra Shukla, PhD Student (4)

Affiliations

(1) Centro Interdipartimentale di Ricerca in Storia del Diritto, Filosofia, e Sociologia del Diritto e Informatica Giuridica (CIRSFID), Alma Mater Studiorum – Università di Bologna, Italy
(1) Institute of Law and Technology, Universitat Autònoma de Barcelona, Spain
(2) La Salle – Universitat Ramon Llull, Barcelona, Spain
(3) Institute of Cognitive Sciences and Technologies, ISTC-CNR, Roma, Italy.
(4) Universitat Rovira i Virgili, Tarragona, Spain. Instituto de Robótica para la Dependencia, Sitges, Spain

Title

An Interdisciplinary Approach To Improving Cognitive Human-Robot Interaction – A Novel Emotion-Based Model

Session

Session 3: Emotions in Human Robot Interactions

Time and location

Tuesday, October 18, 13:30-14:00, Auditorium B

Abstract

Socially Assistive Robotics (SAR) aims to provide robot-assisted therapy, for physical as well as cognitive rehabilitation. The paper analyzes two distinct use cases of cognitive rehabilitation therapies, one among involving children with Traumatic Brain Injury (TBI); and another one; second among involving individuals with Intellectual Disability (ID), and raises concerns regarding emotional adaptation, personalization, design, and ELS issues of human- robot interaction in such cases. The paper's aim is to provide some guidance on how social robots should be designed in order to accommodate emotions in HRI as well as to respect the rights of the persons with disabilities. We argue that it is critically important to address the concerns highlighted in order to empower robots with empathetic behavior and to deliver effective cognitive rehabilitation therapies.

About the speakers

Eduard Fosch Villaronga's main research focuses on the legal and ethical aspects of personal care robots and on robot therapy for children with autism.
Alex Barco main research interests are Robotics, Social Robotics, Educational Robotics, Therapeutic Robotics and Service Robotics.
Beste Özcan is an interaction, social robot and wearable design researcher for the therapy of children with autism and education.
Jainendra Shukla's research interests include Social and Rehabilitation Robotics, Humanoid Robotics, Machine Learning and Robot Assisted Therapy and its Ethical, Legal and Social Implications (ELSI).

MAIKE KLEIN

Name Maike Klein, M. A. (Junior Researcher)

Affiliation Institute of Philosophy, University of Stuttgart, Germany

Title **Can Artificial Systems Have Genuine Emotions?**
- The Enactive Approach to Affectivity and Artificial Systems

Session Session 3: Emotion in Human Robot Interactions

Time and location Tuesday, October 18, 14:00-14:30; Auditorium B

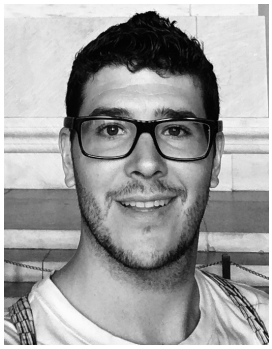
Abstract

In order to investigate whether robots, or, more generally, artificial systems, can have emotions, I will shed a light on Giovanna Colombetti's enactive theory of emotions because the idea of an enactive approach, especially the role it grants biology, seems to be conflicting with the idea of emotional artificial systems. I will take a look at some points of contact between the enactive approach to emotions and its interest regarding artificial systems, first and foremost the enactive notions of autonomy and "sense-making". In what way may these concepts be realized in artificial systems as well? This will entail the question of what living systems are and what distinguishes from an artificial system, in general but especially regarding to their emotions. Having analyzed these concepts, is there any case left in which we can speak of genuine emotions of an artificial system? If not, what kind of emotions may artificial systems then have?

About the speaker

Currently, I am preparing a PhD on the topic of "Emotions in artificial systems", considering the links between Philosophy, Psychology and Computer Science. My main research areas are Philosophy of Mind, Emotion theory, and Embodied Cognition. I am also interested in Roboethics and the Philosophy of Psychiatry. Since March 2016, I work as a researcher at the University of Stuttgart, after having completed a binational M. A. from the Universities of Stuttgart and Paris 8 Vincennes-Saint Denis.

EDUARD FOSCH VILLARONGA (ET AL.)



Names

Eduard Fosch Villaronga, Ph.D. Student. (1)
Vishwas Kalipalya-Mruthyunjaya (2)

Affiliation

(1) Centro Interdipartimentale di Ricerca in Storia del Diritto, Filosofia, e Sociologia del Diritto e Informatica Giuridica (CIRSFID), Alma Mater Studiorum – Università di Bologna, Italy
(1) Institute of Law and Technology, Universitat Autònoma de Barcelona, Spain
(2) Carnegie Mellon University, Pittsburgh, PA, United States

Title

Robot Enhancement of Cognitive and Ethical Capabilities of Humans

Session

Session 4: Education, Art, and Innovation

Time and location

Tuesday, October 18, 15:00-15:30; Auditorium B

Abstract

The aim of this paper is to mold and materialize the future of learning. The paper introduces a Modular Cognitive Educator System (MCES), which aims to help people learn cognitive and ethical capabilities to face one of the indirect impacts of the robot revolution, namely, its impact on the educational system. MCES discusses the importance of agile mindset in future learning processes, which is extended by the inclusion of other values and skills such as effort, perseverance, adaptability, and creativity. Subsequently, MCES interconnects new age technologies and education to induce new approaches in thinking and learning.

About the speakers

Eduard Fosch Villaronga is a Ph.D. Student in the Joint International Doctoral Degree in Law, Science and Technology Erasmus Mundus Programme coordinated by University of Bologna, Italy. His main research focuses on the legal and ethical aspects of personal care robots and on robot therapy for children with autism. His research interests include smart regulations, robotics, education and human-human interaction. Eduard has a legal background holding a double LL.M in European Law from University of Toulouse and Autonomous University of Barcelona, and a MA in IT Law from Autonomous University of Madrid.

Vishwas Kalipalya-Mruthyunjaya graduated with dual masters in robotics from Plymouth university and CMU. He is a specialist in social robotics and his main research is in human robot interaction. He currently focuses on AI and cognitive science aspects in human robot interaction.

BOJANA ROMIC

Name Bojana Romic, Lecturer

Affiliation Malmö University, Sweden

Title **"Are You Talkin' to Me?" A Study of Social Robots Featuring in Robotic Art**

Session Session 4: Education, Art, and Innovation

Time and location Tuesday, October 18, 15:30-16:00; Auditorium B

Abstract

This presentation will introduce my ongoing theoretical research on robotic art, which is seen as a repository of narratives that challenge stereotypical representations of social robots.
I argue that circulation of images of both existing and fictional social robots affects the aesthetics of future robots (including fictional ones). I further argue that robotic art offers a valuable critique of both existing and fictional robots by providing an important discursive space in regard to aesthetics and ethical concerns.

About the speaker

Bojana Romic Ph.D. is a video artist and media researcher based in Copenhagen. She teaches at K3 (Konst, kultur och kommunikation) department, Malmö University.
Her research interest is focused on the analysis of media texts and reception amongst their audiences. Bojana is a member of ROCA (Robot Culture and Aesthetics) group, University in Copenhagen, and a member of CEDAR (Consortium on Emerging Directions in Audience Research).
www.bojanaromic.com

SOFIA SERHOLT (ET AL.)

Name

Sofia Serholt, PhD student; Wolmet Barendregt, Assoc. Professor;
Dennis Küster, PhD; Aidan Jones, PhD student;
Patrícia Alves-Oliveira, PhD student; Ana Paiva, Assoc. Professor

Affiliation

Department of Applied IT, University of Gothenburg, Sweden

Title

Students' Normative Perspectives on Classroom Robots

Session

Session 4: Education, Art, and Innovation

Time and location

Tuesday, October 18, 16:00-16:30; Auditorium B

Abstract

As robots are becoming increasingly common in society and education, it is expected that autonomous and socially adaptive classroom robots may eventually be given responsible roles in primary education. In this presentation, the results of a questionnaire study carried out with students enrolled in compulsory education in three European countries will be presented. The study aimed to explore students' normative perspectives on classroom robots pertaining to roles and responsibilities, student-robot relationships, and perceptive and emotional capabilities in robots.

About the speaker

Sofia Serholt holds a Master's of Education and is currently a PhD student in Applied IT for the Educational Sciences. Her main research areas are child-robot interaction in natural settings, and teachers' and students' perspectives on social and ethical aspects of robots.

Wolmet Barendregt is Assoc. Professor at the Dept. of Applied IT, University of Gothenburg, Sweden. Her main research fields are design and evaluation of ICTs for children.

Dennis Küster specializes in emotion research, and is currently a scientific fellow at the Department of Psychology and Methods, Jacobs University Bremen, Germany.

Aidan Jones is a PhD student within the School of Electronic, Electrical and Computer Engineering, University of Birmingham, UK, mainly studying affective behavioral computing and robotics.

Patrícia Alves-Oliveira is a PhD student in the field of psychology applied to HRI at INESC-ID and Instituto Superior Técnico, Universidade de Lisboa, Portugal.

Ana Paiva is Assoc. Professor at University Institute of Lisbon, Portugal. Her research interests are autonomous and conversational agents, robots and multi-agent simulation systems.

Selected publications:

S. Serholt, C. Basedow, W. Barendregt, M. Obaid, Comparing a Humanoid Tutor to a Human Tutor Delivering an Instructional Task to Children. In *Proceedings of the 2014 IEEE-RAS International Conference on Humanoid Robots*, (2014).

S. Serholt, et al., The case of classroom robots: teachers' deliberations on the ethical tensions, AI & SOCIETY (2016), 1-19.

AHTI-VEIKKO PIETARINEN

Name Ahti-Veikko Pietarinen, Professor

Affiliation Ragnar Nurkse School of Innovation and Governance,
Tallinn University of Technology, Estonia

Title **What Your Computer Still Can't Know: A Refutation of Bringsjord's Refutation of Searle's Refutation of Bostrom and Floridi**

Session Session 5: Artificial Meaning and Rationality

Time and location Wednesday, October 19, 13:00-13:30, Auditorium B

Abstract I refute Bringsjord's attempted refutation of Searle, who has argued against two recent visions: Bostrom's super-intelligence (post-humanism) and Floridi's info-spheres (information revolution). My refutation derives from the impossibility of Turing machines to compute consequential information not linked with observations of its output. Placing post-humanism and information revolution under a philosophical perspective leads to an identification of an unspoken presupposition in both: universalism of meaning. A philosophical theory of information needs a semiotic theory of signs and representations that take information to be a property of signs that are linked with their interpreting minds.

About the speaker Professor Ahti-Veikko Pietarinen PhD (University of Helsinki) directs the Chair of Philosophy and currently teaches as a visiting professor at the Centre for the Study of Language and Cognition at Zheijang University in China and as a professor at the University of Helsinki. In his previous career he has worked at the Harvard University as the Houghton Library Visiting Fellow, as a visiting professor at the Kyung Hee University in Republic of Korea and as an adjunct professor at the University of Turku and at the University of Helsinki. Professor Pietarinen's areas of specialization include Philosophy of Logic & Language, Philosophy of Science, Pragmatism, History of Analytic & American Philosophy and the Philosophy of Mathematics.

S.M. AMADAE

Name S.M. Amadae, PhD, Senior Research Fellow (1) Research Affiliate (2)

Affiliation (1) Academy of Finland Centre of Excellence in the Philosophy of Social Science, University of Helsinki, Finland
(2) Program in Science, Technology, and Society, Massachusetts Institute of Technology, Cambridge, MA, USA

Title **Computability of Rational Action**

Session Session 5: Artificial Meaning and Rationality

Time and location Wednesday, October 19, 13:30-14:00; Auditorium B

Abstract In this talk I argue that the rationality characterizing strategic action in game theory is computable. In making this argument I discuss parametric ordinal decision-theory developed by Kenneth J. Arrow, and the parametric expected utility rankings of John von Neumann and Oskar Morgenstern. I next discuss von Neumann and Morgenstern's two-person zero-sum game theory. I argue that even though von Neumann and Morgenstern introduce rational decision-making predicated on a randomizing device, that this procedure is subject to computation. Moreover, whereas the Arrovian actors and von Neumann Morgenstern expected utility maximizing agents can be subject to indecisiveness due to indifference among elements in an optimal choice set, if we assume repeating choice contexts, then von Neumann and Morgenstern's introduction of randomization in mixed-strategies can solve the problem of computing decisions in these cases. This argument is a fundamental part of a larger project that argues that the strategic rationality formalized by von Neumann and Morgenstern is computable in the sense of the Church thesis. If this is true, then insofar as strategic rationality (also called rational choice) is paradigmatic of instrumental rationality, then these agents are in principle no different from artificial intelligences with the same instructions for action (rules linking choices and outcomes) and identical preferences and beliefs.

About the speaker S.M. Amadae works on questions of scientific imperialism and interdisciplinarity. Other topics of interest include identifying the conditions helpful for promoting individuals' freedom, and the appropriate or legitimate relationship between governance and private market exchange. Amadae's recent book *Prisoners of Reason: Game Theory and Neoliberal Political Economy* (Cambridge University Press 2016) analyses the overuse and misuse of the Prisoner's Dilemma model throughout political science. This text builds on the award-winning *Rationalizing Capitalist Democracy: The Cold War Origins of Rational Choice Liberalism* (University of Chicago Press 2003). This prevous book argues that game theory transformed the study of economics by treating both markets and politics as the outcome of strategic interactions, and that this new understanding transformed liberal theory evident in the work of James M. Buchanan and John Rawls.

MARTIN MOSE BENTZEN

Name Martin Mose Bentzen, Assistant Professor

Affiliation DTU Management Engineering, Technical University of Denmark, Denmark

Title **The Principle of Double Effect Applied to Ethical Dilemmas of Social Robots**

Session Session 5: Artificial Meaning and Rationality

Time and location Wednesday, October 19, 14:00-14:30; Auditorium B

Abstract

The introduction of social robots into society will require that they follow ethical principles which go beyond consequentialism. In this paper, I show how to apply the principle of double effect to solve an ethical dilemma involving robots studied by Alan Winfield and colleagues. The principle of double effect states conditions for ethically acceptable behavior when there are both positive and negative consequences of an action. I propose a formal semantics with actions, causes, intentions, and utilities based upon the work of Judea Pearl, John Horty, and others. With this formal semantics, the question of whether an action is permitted according to the principle of double effect is reduced to deciding whether a certain formula is true or otherwise.

About the speaker

Martin Mose Bentzen is an assistant professor at the Technical University of Denmark where he teaches philosophy of science and ethics in engineering. He has a background in philosophy and wrote his PhD dissertation about deontic logic. Bentzen currently researches philosophical aspects of social robotics, in particular the possibility of devising logical systems for ethical robots.

Contact: mmbe@dtu.dk
Url: www.martinmosebentzen.dk

RAJA CHATILA AND JOHN C. HAVENS

Name

Raja Chatila, IEEE Fellow, Director of Research (1)
John C. Havens, Executive Director (2)

Affiliation

(1) French National Center of CNRS-Sorbonne UPMC Institute of Intelligent Systems and Robotics, Paris, France
(2) The Global Initiative for Ethical Considerations in the Design of Autonomous Systems

Title

Values By Design – Addressing Ethical Concerns for Autonomous Systems and Artificial Intelligence

Session

Session 6: Realizing Value-Oriented Design

Time and location

Wednesday, October 19, 15:00-16:00; Auditorium B

Abstract

The Global Initiative for Ethical Considerations in the Design of Autonomous Systems is an Industry Connections Program of the IEEE Standards Association launched in April, 2016. A primary goal of The Initiative is to create a document called, "Addressing Ethical Concerns for Autonomous and Intelligent System Design" ("ECSD") that is being developed by over one hundred global thought leaders from the artificial intelligence, robotics, ethics, policy, academic and corporate arenas. For this document and for the Global Initiative overall, a key value defining our work is the distinction regarding "human-aligned" autonomous and intelligent systems. By this we mean our insights are informed by a desire to incorporate aspects of human wellbeing that may not automatically be considered in the current design and manufacture of these technologies. Our aspiration along these lines is to reframe the notion of success so human progress can include the intentional prioritization of individual, community, and societal values. In Values by Design, Raja Chatila and John C. Havens, Chair and Executive Director for The Global Initiative, will provide an overview of the ECSD document the Standards Projects already being developed surrounding the Program and how attendees can get involved to join one of our fifteen thriving Committees currently working to update ECSD.

About the speakers

Raja Chatila's research work covers several aspects of autonomous and interactive Robotics such as robot navigation, motion planning and control, cognitive and control architectures, human-robot interaction, and robot learning. He works in projects in the areas of service, field and space robotics. He is author of over 150 international publications on these topics.

John's research focus for the past three years has been on the ethical considerations of Artificial Intelligence that inspired his latest book, Heartificial Intelligence: Embracing Our Humanity to Maximize Machines (Penguin/Random House, 2016).

ELIZABETH ANN JOCHUM AND DAMITH HERATH

Name

Elizabeth Ann Jochum, Assistant Professor
Damith Herath, Assistant Professor

Affiliation

Department of Communication and Psychology
Aalborg University, Denmark

Title

Robot Choreography: Performance Paradigms for Experimental HRI Setups

Session

Session 7: Methodological Issues II

Time and location

Wednesday, October 19, 13:00-13:30; Auditorium C

Abstract

We propose a robust framework for combining performance paradigms with human robot interaction (HRI) research. Following an analysis of several case studies that combine the performing arts with HRI experiments, we propose a methodology and best practices for implementing choreography and other performance paradigms in HRI experiments. Case studies include experiments conducted in laboratory settings, in the wild, and live performance settings. We consider the technical and artistic challenges of designing and staging robots alongside humans in these various settings, and discuss how to combine tools and methods from human computer interaction (HCI) research with established HRI metrics and benchmarks to evaluate these interactions.

About the speaker

Elizabeth Jochum (BA Wellesley College; MA, PhD University of Colorado) is a member of Aalborg U Robotics and Erasmus Mundus Media Arts Cultures faculty. Her research focuses on the intersection of robotics, art, and performance. She collaborated on the Geminoid DK and iSociobot projects, and is the co-founder of Robot Culture and Aesthetics (ROCA) research group. She serves on the editorial board of Global Performance Studies. Her publications appear in *Robots and Art*, *Controls and Art*, *Robotics and Autonomous Systems*, and the *International Journal of Social Robotics*. Her forthcoming book *Robots On Stage* constructs an aesthetics of robot performers.

Damith Herath (B.Sc. University of Peradeniya, Sri Lanka; Ph.D. University of Technology, Sydney,) is an assistant professor at the Human Centered Technology Research Centre, University of Canberra, Australia.

GLENDA HANNIBAL

Name Glenda Hannibal, Junior Researcher

Affiliation Department of Sociology, University of Vienna, Austria

Title **Bringing the Notion of Everyday Life Back to the Center of Social Robotics and HRI**

Session Session 7: Methodological Issues II

Time and location Wednesday, October 19, 13:30-14:00; Auditorium C

Abstract

Notions such as agency, interaction, gender, sociality, animacy, emotions, and empathy have all been favored in critical explorations of social robotics. In this presentation I aim to show that, since the notion of everyday life is motivating the entire field of social robotics and HRI, it is necessary to empirically reconstruct how roboticist within these fields interpret and (re)construct this specific notion. The notion of everyday life with its current meanings and some initial reflections about how such notion gets its content, as well as how this concern differs from the one found in laboratory studies, will be discussed. After these theoretical reflections, very general suggestions will be given about how to empirically study the notion of everyday life when taking into account the ways in which it is being used among the social robotics and HRI engineers themselves.

About the speaker

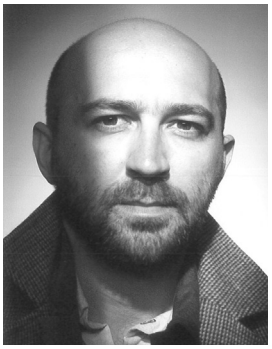
Glenda Hannibal is working on questions related to concept formation within the field of social robotics from the perspectives of philosophy and sociology. During her BA and MA studies in philosophy she explored how people perceive and relate to robots within the areas of ontology and epistemology. Currently working on her PhD in sociology Glenda is studying social robotics engineers working within the context of commercial companies by exploring empirically how they interpret and construct the notion of everyday life.

Publications:

Bertel, L.; Hannibal, G. (2015): "The NAO robot as a Persuasive Educational and Entertainment Robot (PEER) – a case study on children's articulation, categorization and interaction with a social robot for learning". In: Læring & Medier (LOM), Vol. 8, Nr. 14.

Hannibal, G. (2014): 'Dynamic' Categorization and Rationalized Ascription: A Study on NAO". In: Sociable Robots and the Future of Social Relations – Proceedings of Robo-Philosophy 2014, Eds. J. Seibt, R. Hakli, M. Nørskov, pp. 343-347.

LUIS DE MIRANDA



Name Luis de Miranda, PhD student

Affiliation CRAG – Creation of Reality Group, the University of Edinburgh, UK

Title **We, Anthrobot: Learning From Human Forms of Interaction and Esprit de Corps to Develop More Plural Social Robotics**

Session Session 7: Methodological Issues II

Time and location Wednesday, October 19, 14:00-14:30; Auditorium C

Abstract

We contend that our relationship with robots is too often seen within a universalistic and individualistic mind-frame. We propose a specific perspective in social robotics that we call anthrobotics. Anthrobotics starts with the choice to consider the human-machine intertwining as a dynamic union of more or less institutionalised collectives rather than separated discrete realities (individual humans, on one side, and discrete individualised machines on the other). We draw on our research in types of social interaction and esprit de corps to imagine more plural and harmonious forms of shared natural-artificial cognitive systems. We propose to look at four types of organised groups: conformative, autonomist, creative, and universalistic, that may provide guiding principles for the design of more diverse anthrobots.

About the speaker

Luis de Miranda, now a mature PhD student, was previously an independent researcher and novelist. He has published 13 books in French, essays or novels, including *L'Art d'être libres au temps des automates*, a cultural and philosophical history of digital machines. His short monography on Deleuze, *Is a New Life Possible?*, has been recently published by Deleuze Studies Journal. He is the founder of the anthrobotics cluster at the University of Edinburgh.

MALENE FLENSBORG DAMHOLDT

Name

Malene Flensborg Damholdt, assistant professor, Cand.psych.

Affiliation

Unit for Psychooncology and Health Psychology
Department of Psychology and Behavioural Science,
Aarhus University, Denmark

Title

A Generic Scale for Assessment of Attitudes towards Social Robots: The ASOR-5

Session

Session 7: Methodological Issues II

Time and location

Wednesday, October 19, 15:00-15:30; Auditorium C

Abstract

The research field into social robotics is expanding and with it the need for consistent methods for assessing attitudinal stance towards social robots. In this paper we describe the development and planned validation of the Attitudes towards social robots scale (ASOR-5): a generic questionnaire developed by an interdisciplinary taskforce.

About the speaker

Malene F Damholdt has main research interests in individual differences, neuropsychology, geropsychology and HRI. Her HRI research interests especially focus on attitudes towards robots and how these are influenced and determined by individual differences.

SARA LJUNGBLAD (ET AL.)

Name

Sara Ljungblad, Assist. Professor; Sofia Serholt, PhD student;
Wolmet Barendregt, Assoc. Professor; Pamela Lindgren, PhD student;
Mohammad Obaid, Researcher

Affiliation

Department of Applied IT, Chalmers University of Technology and University of Gothenburg, Sweden

Title

**Are we Really Addressing the Human in Human-Robot Interaction?
Adopting the Phenomenologically-Situated Paradigm**

Session

Session 7: Methodological Issues II

Time and location

Wednesday, October 19, 15:30-16:00; Auditorium C

Abstract

In this paper/presentation we present the vision for our newly started research group on Applied Robotics at Chalmers University of Technology and University of Gothenburg. Based on our experiences in previous projects we think it may be time for the HRI field to start exploring the possibilities of adopting and developing a variety of new human-centered design and evaluation approaches. By opening up for co-design and participation to address the phenomenologically-situated paradigm we can start focusing on more holistic and critical perspectives of what humans may need from robots, bringing new and challenging perspectives for robot research. To understand what kind of solutions people really need and desire, we need to take a more situated as well as open perspective towards desired solutions, even if this is challenging. Thus, design activities should take a starting point in people's existing situations and needs, rather than looking for applications or implications for a specific technology.

About the speakers

- Sara Ljungblad (University of Gothenburg) focuses on interaction design, human computer interaction, user experience, and robotics.
- Sofia Serholt (University of Gothenburg) focuses on child-robot interaction from an educational, social and ethical perspective.
- Wolmet Barendregt (University of Gothenburg) focuses on Child-Computer Interaction.
- Pamela Lindgren (Chalmers University of Technology) focuses on user experience acceptance and adoption of products.
- Mohammad Obaid (Chalmers University of Technology) focuses on human-agent and human-robot social behaviours.

LARS CHRISTIAN JENSEN

Name

Lars Christian Jensen, Ph.D. student

Affiliation

Department of Design and Communication,
University of Southern Denmark, Denmark.

Title

Using Language Games as a Way to Investigate Interactional Engagement in Human-Robot Interaction

Session

Session 7: Methodological Issues II

Time and location

Wednesday, October 19, 16:00-16:30; Auditorium C

Abstract

Social robots are employed in many classrooms and have been shown to aid learning. However, studies show that while schools intend for these robots to be social actors, they are not treated as such by the students. As the social factor is crucial for interactional engagement, this talk discusses how students' engagement with a social robot can be systematically investigated and evaluated using Wittgenstein's metaphor of "language games" in a conversation analytical (CA) framework. CA works from an understanding that human conversations are made up of adjacency pairs, a turn-taking procedure, in which two utterances produced by different speakers are functionally dependent on each other. The pair parts of an adjacency pair exemplify very well Wittgenstein's concept of language games, in that there are interactional rules for them that are beyond mere grammar. Specifically, analyses of adjacency pairs show the extent to which ``language games'' initiated by one party is taken up by the other, while analyses of repair initiations and uptake show what happens in the interaction when this happens.
In order to expose how such an analysis can proceed, I present a small user study in which a robot plays a word formation game with single human participants, in which engagement is determined by means of an analysis of the "language games" played with the robot.

About the speaker

Lars Christian Jensen received his MA in Business Communication & Communication Design from the University of Southern Denmark. During his studies, he part-timed as an interaction analyst for both humanistic and technical research groups and thus participated in many international inter-disciplinary collaborations between designers, engineers and linguists. This work introduced him to fields such as Human-Robot Interaction, High-Tech Business Venturing and IT-Product Design. He is currently pursuing a PhD at the University of Southern Denmark in the field Human-Robot Interaction, in which he investigates how social robots can be used as a resource for teachers in foreign language learning environments.

ANNE JULIE ARNFRED AND CHRISTIAN RAVN BREMS

Names

Anne Julie Arnfred, Curator and researcher and
Christian Ravn Brems, Artist and researcher

Affiliation

Department of Arts and Cultural Studies, University of Copenhagen, Denmark

Title

The Third Space - Actualising the Social Robot

Session

Session 8: Social Norms and Robot Sociality

Time and location

Thursday, October 20, 13:00-13:30; Auditorium B

Abstract

The focus of this paper is to suggest a theoretical and conceptual framework for the development of a novel model that can be used for developing social robots, focused on seeing the users' projected abilities onto the robot as decisive for the actualisation of the robot in a series of different social contexts (Breazeal). Focus will be on conceptually grounding the discussion theoretically through an interdisciplinary approach arising from the fields of psychology, sociology, visual culture studies and robotics. We will look at the terms, Projective - psychology (Klein, Giddens etc), animatedness (Ngai) and vison and visuality (Hall Foster), for through that to explore more ways to circle in the actualisation of the robot, in a human - robot interaction.

About the speakers

Anne Julie Arnfred (b. 1977) is a Danish curator and researcher.
She mainly focusses on finding new connections in everyday culture and art, manifesting new connections and insights from a different perspective.
She has been working at the renown Nikolaj Copenhagen Contemporary Art Center (2007 - 2016) and is currently curator and museum inspector at the Museum for Contemporary Art in Roskilde.

Christian Brems (www.christianbrems.com) is a Danish artist and researcher who has exhibited widely since 2010. Brems' artistic work and research investigates the Third Spaces that arise between mediums, especially the textual and visual, and the space that exists between scientific and artistic discourses and contexts. Recently Brems has focused on how artistic research and critical design can innovatively contribute to scientific environments.

FELIX LINDNER

Name Felix Lindner, Lecturer

Affiliation Computer Science Department, Foundations of Artificial Intelligence Group, Albert-Ludwigs-University Freiburg, Germany

Title **How to Count Multiple Personal-Space Intrusions in Social Robot Navigation**

Session Session 8: Social Norms and Robot Sociality

Time and location Thursday, October 20, 13:30-14:00; Auditorium B

Abstract One aspect of social robot navigation is to avoid personal space intrusions. Computationally, this can be achieved by introducing social costs into a robot's path planner's objective function. This article tackles the normative question of how robots should aggregate social costs incurred by multiple personal-space intrusions. Of particular interest is the question whether numbers should count, i.e., whether a robot ought to intrude into one person's personal space in order to avoid intruding into multiple personal spaces. This work proposes four different modes of aggregation of the costs of intrusions into personal space, discusses some of the philosophical arguments, and presents results from a pilot study.

About the speaker

Main research:
- Application of knowledge representation formalisms and technology to robotics
- Spatial reasoning for human-robot interaction
- Human-centered robot decision making
- Models of robot personality

Since 2015, Lecturer in the Foundations of Artificial Intelligence Group, University of Freiburg, Germany.
2009 – 2015, Research and Teaching assistant at the University of Hamburg, Germany.
2002 – 2009, Computer science student at the University of Hamburg, Germany.

PhD thesis on modeling spatial behavior of social robots:
Lindner, F. (2015) *Soziale Roboter und soziale Räume: Eine Affordanz-basierte Konzeption zum rücksichtsvollen Handeln*. PhD Thesis, Universität Hamburg, Hamburg.

ARTO LAITINEN

Name Arto Laitinen, Professor

Affiliation Philosophy, School of Social Sciences and Humanities, University of Tampere, Finland

Title **Robots and Human Sociality: Normative Expectations, the Need for Recognition, and the Social Bases of Self-Esteem**

Session Session 8: Social Norms and Robot Sociality

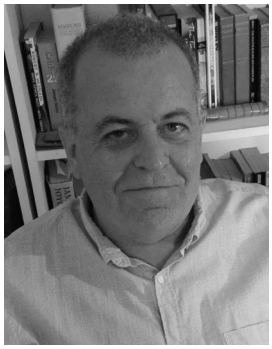
Time and location Thursday, October 20, 14:00-14:30; Auditorium B

Abstract

It has been argued that human sociality has an intrinsically normative grammar: not only do norms guide our own behaviour, we have normative expectations concerning the way others behave, including how they take and treat us. These expectations shape our experiences concerning the social world. This paper explores three theses: 1) The normative grammar need not be a matter of "commitments". 2) While we need to operate in the "intentional stance" in interaction with robots, to implement a fully "personifying" stance would be a category mistake. Social robots form a new category, new vaguely demarcated "social grammar", with genuine normative expectations and experiences. Rewarding experiences caused by responses from robots need not be deceptive, although taking a fully "personifying stance" would be deceptive: the dichotomy between full persons and mere things is too coarse. 3) Recognition from others is central in the social basis of self-esteem. Feedback from robots is an interesting combination of objective non-social feedback and some kind of simulated recognition: robots can send real recognitive messages even when they themselves are not recognizers.

About the speaker Arto Laitinen is Professor in Social Philosophy at University of Tampere, co-editor of the Journal of Social Ontology, and vice director of the multidisciplinary project "Robotics and the Future of Welfare Services" funded by the strategic research council of the Academy of Finland. Laitinen has published on various areas of philosophy including theories of mutual recognition, social ontology, and normativity.

LUCIANA BENOTTI AND PATRICK BLACKBURN



Names

Luciana Benotti, Adjoint Professor
Patrick Blackburn, Associate Professor

Affiliation

Section of Computer Science, Facultad de Matemática, Astronomía, Física y Computación, Universidad Nacional de Córdoba, Argentina

Section of Philosophy and Science Studies, Centre for Communication and Arts, University of Roskilde, Denmark

Title

Polite Interactions with Robots

Session

Session 8: Social Norms and Robot Sociality

Time and location

Thursday, October 20, 15:00-15:30; Auditorium B

Abstract

We sketch an inference architecture that permits linguistic aspects of politeness to be interpreted; we do so by applying the ideas of politeness theory to the SCARE corpus of task-oriented dialogues, a type of dialogue of particular relevance to robotics. The fragment of the SCARE corpus we analyzed contains 77 uses of politeness strategies: our inference architecture covers 58 of them using classical AI planning techniques; the remainder require other forms of means-ends inference. So by the end of the paper we will have discussed in some detail how to interpret automatically different forms of politeness — but should we do so? We conclude with some brief remarks on the issues involved.

About the speakers

Luciana Benotti is Professor of Computer Science at the Universidad Nacional de Córdoba in Argentina. Her research areas are Artificial Intelligence, Natural Language Processing and Human-Computer Interaction. Her research goal is to contribute to the development of communication and interaction skills for artificial autonomous agents. Born in Argentina, she researched at Universities in Italy, Spain, France and the United States before getting a professorship in Argentina in 2010.

Patrick Blackburn is Professor of Formal Philosophy at the Roskilde University in Denmark. His research focuses on logic and its applications in cognitive science, computer science and philosophy. He is especially interested in applications that have to do with ordinary human languages (in particular semantics and pragmatics) and applications of logic in cognitive and social psychology. Originally from New Zealand, he worked at universities and research institutes in England, Scotland, the Netherlands, Germany and France before moving to Denmark in 2011.

INGAR BRINCK (ET AL.)

Names

Ingar Brinck, Professor
Christian Balkenius, Professor
Birger Johansson, Researcher

Affiliation

Department of Philosophy and Cognitive Science,
Lund University, Sweden

Title

Making Place for Social Norms in the Design of Human-Robot Interaction

Session

Session 8: Social Norms and Robot Sociality

Time and location

Thursday, October 20, 15:30-16:00; Auditorium B

Abstract

We argue that social robots should be designed to behave similarly to humans and that social norms constitute the core of human interaction. Whether robots can be designed to behave in human-like ways turns on whether they can be designed to organize and coordinate their behavior with others' social expectations. We suggest that social norms regulate interaction in real time, and agents rely on dynamic information about their own and others' attention, intention and emotion to perform social tasks.

About the speakers

Ingar Brinck has published on development and evolution of attention, metacognition, joint attention, social norms and cooperation in e.g. Mind & Language, Infant & Child Development and Theory & Psychology, Frontiers and Phenomenology & Cognitive Science, taking an embodied, embedded and dynamic perspective.

Christian Balkenius works with models of cognitive development in humanoid robots with a focus on processes in learning and attention. He has recenetly published in Philosophical Transactions of the Royal Society B, PNAS, and Psychological Science and is affiliated with Lund University Cognitive Science, Sweden.

Birger Johansson's research concerns building robots inspired by child development. He is affiliated with Lund University Cognitive Science, Sweden and Uppsala Child and Baby Lab, Psychology, Uppsala University, Sweden.

MAREK ROSA

Name

Marek Rosa, CEO, CTO and founder of GoodAI

Affiliation

GoodAI, a private general artificial intelligence research and development company, Prague, Czech Republic

Title

AI Roadmap Institute: Big Picture Thinking in General AI Research, Safety and Ethics

Session

Session 8: Social Norms and Robot Sociality

Time and location

Thursday, October 20, 16:00-16:30; Auditorium B

Abstract

The AI Roadmap Institute is a new initiative to collate and study various AI and general AI roadmaps proposed by those working in the field. It will map the space of AI skills and abilities: research topics, open problems, and proposed solutions. There are currently two categories of roadmaps:

- Research and development, or how to get us to general AI
- Safety/Futuristic - which explores how to keep humanity safe and the years after general AI is reached.

The institute is concerned with 'big picture' thinking. The amount of research into AI has exploded over the last few years, with many papers on AI development appearing daily. The institute's major output will be consolidating this research into a single visual summary. The summary highlights aspects of AI development, AI ethics and safety where solutions exist or are needed, outlines the similarities and differences among roadmaps, stages which need to be addressed by new research, branching and converging of roadmaps, and examples of AI skills and testable milestones. This visual roadmap summary will be constantly updated, with the roadmaps described by the institute in an implementation agnostic manner.

The institute is open for the scientific community and everyone will be invited to contribute. Other research groups can take inspiration from or suggest new milestones and branches for the roadmaps.

About the speaker

Marek is the CEO, CTO, and founder of GoodAI, a general artificial intelligence R&D company, and the CEO and founder of Keen Software House, an independent video game development studio.

Marek has been interested in artificial intelligence since childhood. After the success of the Keen Software House titles, Marek was able to personally fund with $10mil a new general AI research project building human-level artificial intelligence. The project, now known as GoodAI, began in January 2014 and has grown to an international team of 30 researchers.

MATTHIJS SMAKMAN

Name Matthijs Smakman, Lecturer and Researcher

Affiliation Institute for Information and Communication Technology, HU University of Applied Sciences, the Netherlands

Title **Robots and Moral Obligation**

Session Session 9: Ethical Tasks and Implications II

Time and location Thursday, October 20, 13:00-13:30; Auditorium C

Abstract Using arguments for well-being as the ultimate source of moral reasoning, this paper argues that there are no ultimate, non-derivative reasons to program robots with moral concepts such as moral obligation, morally wrong or morally right. Although these moral concepts should not be used to program robots, they are not to be abandoned by humans since there are still reasons to keep using them, namely: as an assessment of the agent, to take a stand or to motivate and reinforce behavior. Because robots are completely rational agents they don't need these additional motivations, they can suffice with a concept of what promotes well-being. How a robot knows which action promotes well-being to the greatest degree is still up for debate, but a combination of top-down and bottom-up approaches seem to be the best way.

About the speaker My main research areas are Business Ethics and Machine Ethics. Next to my research I teach bachelor students and develop courses in the fields of: Business Ethics, ICT and Organizations, Business Process Management, Ethics of Technology, Social Media Communications and Big data.

MICHAEL FUNK

Name Michael Funk, University Assistant

Affiliation Philosophy of Media and Technology, University of Vienne, Austria

Title **Tacit Security? Roboethics and Societal Challenges of 'Social Robotic Information- and Cyperwar'**

Session Session 9: Ethical Tasks and Implications II

Time and location Thursday, October 20, 13:30-14:00; Auditorium C

Abstract In this paper ethical and epistemological challenges of data security, information protection and privacy in social robotics are addressed. Analyzing the characteristics of asymmetric "new wars" including cyberwar and information warfare the IT based problematic of social robots will be elaborated as *Social Robotic Information- and Cyberwar*. It is argued that a security policy based on tacit knowledge (*Tacit Security*) is one possible answer to current questions in robot ethics and robot philosophy concerning data security.

About the speaker Michael Funk, 2009-2015 Research Assistant (Philosophy of Technology, TU Dresden, Germany), since 2016 University Assistant (Philosophy of Media and Technology, University of Vienna) is working on philosophical aspects of 1. Human-technology-culture-world-relations, 2./3. Information technologies and robotics (including cyberwar, drones and warfare), 4. Synthetic biology and paleonanthropology, 5. Music, and 6. Transdisciplinarity. More information, also about publications, available at: www.funkmichael.com/research

MYRTHE VAN NUS

Name Myrthe van Nus, MA LLM, Research associate

Affiliation University of Twente, the Netherlands

Title **Social Robots, Privacy & Ownership of Data: Some Problems and Suggestions**

Session Session 9: Ethical Tasks and Implications II

Time and location Thursday, October 20, 14:00-14:30; Auditorium C

Abstract

This paper aims to show why it is important to stimulate thinking on privacy and ownership of data in the context of social robots. Interactive applications on computers that collect and share personal data and information have been with us for a while now. But, the rise of social robotics adds a new dimension to the collecting and sharing of personal data and information.
In this paper I argue that – in the case of social robotics – the privacy of its users is increasingly at stake. In order to prove this, the paper connects a concept of privacy with examples from social robotics, showing not only the more general risks of hacking but also the privacy risk characteristic to social robots.
After this, the question is raised how to protect ourselves against these risks: what to do, for instance, when one's social robot has been hacked? Therefore the paper explores possibilities and problems within the legal area as well as some (philosophical) suggestions and directions for further thinking on data ownership.

About the speaker

Myrthe van Nus (1986) studied philosophy and law at the Erasmus University, Rotterdam, the Netherlands. She graduated cum laude both times. Currently she is assistant director of the 4TU centre for Ethics and Techology, based at the University of Twente, and research associate at the same university.

YVETTE PEARSON AND JASON BORENSTEIN

Names

Yvette Pearson, Associate Professor and Chair (1)

Jason Borenstein, Director of Graduate Research Ethics Programs and Associate Director of the Center for Ethics and Technology (2)

Affiliation

(1) Department of Philosophy and Religious Studies, Old Dominion University, Norfolk, Virginia, United States of America
(2) School of Public Policy and Office of Graduate Studies, Georgia Institute of Technology, USA

Title

The Ethical Impact of an Increased Presence of Robots on Human-Human Interaction (HHI) within Aging Populations

Session

Session 9: Ethical Tasks and Implications II

Time and location

Thursday, October 20, 15:00-15:30; Auditorium C

Abstract

This paper examines ethical issues related to the use of robots as companions or caregivers for older adults. While so-called doom scenarios that depict myriad negative effects of increased robot presence and expanded human-robot interaction (HRI) raise engaging concerns, this paper seeks to diffuse some of those concerns and examine the potential impact of an increased robot presence and HRI on human-human interaction (HHI). Dystopian scenarios that focus almost exclusively on HRI neglect to acknowledge that humans will likely continue to interact, perhaps in novel ways, and fail to incorporate the possible beneficial effects of robot presence on HHI. The importance of supporting HHI must be kept in view when speculating about the future of HRI.

About the speaker

Yvette Pearson's main areas of research include robot ethics and bioethics, particularly reproductive ethics and direct-to-consumer marketing of genetic tests, and crisis management ethics. She recently published a coauthored book with Burton St. John titled: *Crisis Communication and Crisis Management: An Ethical Approach.* Alongside her research in applied ethics, she has taught a variety of courses in applied ethics over the past 20 years.

FILIPPO SANTONI DE SIO

Name Filippo Santoni de Sio, Assistant Professor

Affiliation Department Philosophy/Ethics of Technology,
Delft University of Technology, the Netherlands

Title **Consent to the Use of Companionship Robots by Mentally Disordered Persons: an Ethical Perspective**

Session Session 9: Ethical Tasks and Implications II

Time and location Thursday, October 20, 15:30-16:00; Auditorium C

Abstract

The paper concerns the ethics of the design and use of therapeutic companionship robots like Paro by patients with mental disabilities such as dementia. The ethical debate has so far been focused mainly on the psychological benefits of Paro on the positive side, and on the risks of loss of human contact, infantilisation, and deception of patients on the negative side. In this paper I give a fresh contribution to this debate by discussing the ethical relevance of the patient's consent to the use of the robot. This topic hasn't been much discussed, probably as it is implicitly assumed that people with mental disabilities like dementia simply cannot express any valid consent to their treatment. I will challenge this assumption by looking at the recent legal debate on the legal consent to sexual intercourse by mentally disordered people. I will endorse John Stanton Ife's claim that failing to be fully rational and autonomous agents, mentally disordered people may still express, under certain conditions, some valid consent to perform activities that they see as desirable. I will then explore the relevance of this claim for the patients' consent to the use of companionship robots. In the final part of the paper, based on the previous discussion, some design guidelines for companionship robots are provided.

About the speaker

Filippo received his PhD in Philosophy at the University of Turin in 2008. He has already published one monograph, two edited collection and more than thirty philosophical papers on: moral and legal responsibility, the ethics of cognitive enhancement, and robot ethics. His last book is the edited collection *Drones and Responsibility: Legal, Philosophical and Socio-Technical Perspectives on Remotely Controlled Weapons* (Routledge 2016, with Ezio Di Nucci). He has recently prepared a "white paper" on the ethics of self-driving cars for the Dutch Ministry of Infrastructure and Environment. He in the organizing committee of the *Foundation for Responsible Robotics.* Personal website: filipposantoni.net

HIN-YAN LIU

Name Hin-Yan Liu, Associate Professor

Affiliation Centre for International Law, Conflict and Crisis, Faculty of Law, University of Copenhagen

Title **Structural Discrimination and Autonomous Vehicles: Immunity Devices, Trump Cards and Crash Optimisation**

Session Session 9: Ethical Tasks and Implications II

Time and location Thursday, October 20, 16:00-16:30; Auditorium C

Abstract

This paper examines the potential for structural discrimination to be woven into the fabric of autonomous vehicle developments, which remain underexplored and undiscussed. The prospect for structural discrimination arises as a result of the coordinated modes of autonomous vehicle behaviour that is prescribed by its code. This leads to the potential for individuated outcomes to be networked and thereby multiplied consistently to any number of vehicles implementing such a code. The aggregated effects of such algorithmic policy preferences will thus cumulate in the reallocation of benefits and burdens to certain categories of persons in a relatively stable manner. The spectre of implicit structural discrimination is therefore raised by the orderly and stable rearrangement of biases that may be expressed by the controlling algorithm.
The potential for a much more pernicious form of active structural discrimination looms with the possibility of crash optimisation impulses in which a protective shield is cast over those individuals in which society may have a vested interest in prioritising or safeguarding. A stark dystopian scenario is introduced to sketch the contours whereby personal beacons signal individual identity, and potentially relative worth, to autonomous vehicles engaging in a crash damage calculus. At the risk of introducing these ideas into the development of autonomous vehicles, this paper hopes to spark a debate to foreclose these eventualities.

About the speaker

My engagement with law and robotics began through a project on Autonomous Weapons Systems, the output of which was recently published by CUP (September 2016). The concern that unifies my research is the prospect for imperceptible structural injustices perpetrated through the legal system and its processes. While framed in the context of Private Military Companies, my most comprehensive attempt at dissecting these pernicious effects is 'Law's Impunity', published by Hart (2015). Before moving to the University of Copenhagen, I worked at the European University Institute, and held academic positions at New York University (NYU) in Florence, King's College London and the University of Westminster.

DENNIS KÜSTER AND ALEKSANDRA ŚWIDERSKA

Name Dennis Küster, PhD; Aleksandra Świderska, PhD

Affiliation Department of Psychology and Methods,
Jacobs University Bremen, Germany

Title **Moral Patients: What Drives the Perceptions of Moral Actions Towards Humans and Robots?**

Session Session 10: Perception of Social Robots

Time and location Friday, October 21, 13:00-13:30; Auditorium B

Abstract

Robots will eventually become capable of engaging in norm-regulated interactions with humans. But do people perceive them as equivalent moral entities? We will present two psychological studies (one completed, one ongoing) on the perception of robots as moral patients. Our data suggest that robots are afforded a certain degree of moral consideration in the face of malevolent as well as benevolent actions, yet systematic differences to humans still remain. We will attempt to explain these empirical findings as a function of the level of human likeness of appearance and behaviors of robots, using visual vignettes.

About the speaker

Dennis Küster, PhD, studies emotions in social context from a multi-level appraisal perspective. His research topics include contextual and social factors influencing emotion expression, online self-presentation (avatars), affect sensing in Human-Robot-Interaction (HRI), expression of emotions in Human-Computer-Interaction (HCI), as well as methods of emotion assessment, and emotion elicitation. He further studies face perception, including emotion-related facial events such as tears and blushing.

Aleksandra Świderska, PhD, studies humanization and dehumanization in the context of the human and non-human entities' perception.

Selected publications:

L. J. Corrigan, C. Peters, D. Küster, G. Castellano, Engagement perception and generation for social robots and virtual agents. In *Toward Robotic Socially Believable Behaving Systems-Volume I* (pp. 29-51), Springer International Publishing, 2016.

D. Garcia, A. Kappas, D. Küster, F. Schweitzer, The Dynamics of Emotions in Online Interaction, *arXiv preprint arXiv*:1605.03757 (2016).

J. Chołoniewski, A. Chmiel, J. Sienkiewicz, J. A., Hołyst, D. Küster, A. & Kappas, Temporal Taylor's scaling of facial electromyography and electrodermal activity in the course of emotional stimulation, *Chaos, Solitons & Fractals*, 90 (2016), 91-100.

MACIEJ MUSIAŁ

Name Maciej Musiał, assistant professor

Affiliation Institute of Philosophy, Faculty of Social Sciences, Adam Mickiewicz University in Poznań, Poland

Title **Magical Thinking and Empathy Towards Robots**

Session Session 10: Perception of Social Robots

Time and location Friday, October 21, 13:30-14:00; Auditorium B

Abstract

This paper aims to understand why human beings tend to develop empathetic attitudes towards robots by presenting a hypothesis about the presence of magical thinking in interactions with robots. Therefore, whilst much research studies the issue of empathetic attitudes towards robots from the perspective of the natural sciences by referring to biological features of the human brain, this paper investigates it from the perspective of the humanities by referring to humans' cultural features. After establishing animation as a necessary condition of empathy towards robots, it is pointed out that animation is one of the main features of magical thinking described by philosophers, developmental psychologists, psychiatrist and anthropologists as typical for children, members of "primitive" societies and individuals with mental disorders. The presence of further features of magical thinking in empathetic relationships with robots is analyzed. Yet, the paper also indicates the differences between magical thinking in its typical contexts and magical thinking in the context of interactions with robots. Furthermore, possible causes of the presence of magical thinking in relations with robots are discussed.

About the speaker

Maciej Musiał received his PhD in philosophy from Institute of Philosophy, Faculty of Social Sciences, Adam Mickiewicz University in Poznań, Poland, where he currently works as an assistant professor. His main areas of interest include present and future relations between humans and robots in the broader context of general cultural transformations. Specifically, he is interested in interpreting empathetic attitudes towards robots as an expression of the return of magical thinking, and in examining close relationships with robots as a consequence of transformations of intimate relationships between human beings.

VERONIKA VÁŇOVÁ

Name Veronika Váňová, Mgr.

Affiliation Tallinn University of Technology, Estonia

Title **Trust in Human-Robot Interaction: The Role of Appearance**

Session Session 10: Perception of Social Robots

Time and location Friday, October 21, 14:00-14:30; Auditorium B

Abstract

The presentation of on-going research addresses the topic of trust in HRI. Its aim is to investigate if and how simple anthropomorphic features influence the level of trust in non-humanoid robots. Trusting a robot is seen as necessary for successful human-robot interaction (HRI). Trust in HRI can be understood simply as reliance of the human on the robot's abilities. This instrumentalist view can be overcome by a phenomenological-social approach, which sees trust as implicitly present in any social relation, prior to any conscious decision to trust the other. Tempered anthropomorphism is unavoidable and needed for developing trust in robots, but should it be reinforced by robot designers, and if yes, through which means and to what extent? A balance should be found in robotic design in order to make robots more trustworthy; this may rely on a number of factors, such as the robot's performance and attributes, environment and the human's characteristics and abilities.
The methodology of this research project stems from experimental philosophy. Participants will be presented with a written description of two different human-robot interaction scenarios accompanied by pictures. The described scenarios are meant to question the participants' trust in the robot's abilities. The participants will then be asked to evaluate the trustworthiness of the robot. The text and pictures will vary in the tested anthropomorphic features. The chosen methodology aims to provide a first insight into the described research question and also contribute to the discussion on experimental philosophy's research methodology.

About the speaker Second year PhD student interested in ethics of robotics and trust in human-robot interaction. She received her Master's degree in Theory of Media and Communication from Charles University in Prague.

NELLO BARILE

Name Nello Barile, Senior Researcher (1)/Adjunct Professor (2)

Affiliation (1) Department of Art and Media, IULM University of Milan
(2) Department of Communication and Media Studies
Franklin University Switzerland, Switzerland

Title **I Am Her(e): Physical/Cognitive Robots and Human Intimacy in the Imagery of Spike Jonze's Movies**

Session Session 10: Perception of Social Robots

Time and location Friday, October 21, 15:00-15:30; Auditorium B

Abstract

Robotics has made its entry into the sphere of intimacy, thus our notion of intimacy will need to play a central role when we consider the future direction of social robotics. The aim of this on-going research project is to understand the emotional relationship between human and artificial agents, and furthermore, to reflect upon the effects of social robotics on the quality of human intimacy. Our methodological approach consists in a combination of film analysis and qualitative interview. In this paper, we offer brief analyses of the films that are specifically concerned with the theme of love, intimacy, and romance in relation to robots and non-physical artificial agents. Two films were selected for this purpose: *Her* and *I am Here*, both of which were produced by Spike Jonze. We then propose a working theoretical framework that guides our future empirical studies.

About the speaker

Nello Barile teaches media studies and sociology of cultural processes at IULM University of Milan where also coordinated a Master programme in Creativity Management for 6 years. He holds a PhD in communication sciences, resources management, and formative processes at University of Rome "La Sapienza." He has published numerous books in Italy and articles/book chapters in France, Germany, Brazil, and USA. His recent publications include *Brand Renzi. Anatomia del politico come marca*, Milano, Egea (2014); The automation of taste: A theoretical exploration of mobile ICTs and social robots in the context of music consumption, *International Journal of Social Robotics, 7*(3), 407-416 (2015, with Satomi Sugiyama). He is a member of euRobotics topic group "Socially Intelligent Robots and Societal Application."

SATOMI SUGIYAMA

Name Satomi Sugiyama, Associate Professor

Affiliation Department of Communication and Media Studies
Franklin University Switzerland, Switzerland

Title **I Am Her(e): Physical/Cognitive Robots and Human Intimacy in the Imagery of Spike Jonze's Movies**

Session Session 10: Perception of Social Robots

Time and location Friday, October 21, 15:00-15:30; Auditorium B

Abstract Robotics has made its entry into the sphere of intimacy, thus our notion of intimacy will need to play a central role when we consider the future direction of social robotics. The aim of this on-going research project is to understand the emotional relationship between human and artificial agents, and furthermore, to reflect upon the effects of social robotics on the quality of human intimacy. Our methodological approach consists in a combination of film analysis and qualitative interview. In this paper, we offer brief analyses of the films that are specifically concerned with the theme of love, intimacy, and romance in relation to robots and non-physical artificial agents. Two films were selected for this purpose: *Her* and *I am Here*, both of which were produced by Spike Jonze. We then propose a working theoretical framework that guides our future empirical studies.

About the speaker Satomi Sugiyama (Ph.D. Rutgers University) is associate professor of Communication and Media Studies at Franklin University Switzerland. Her research and teaching interests lie at the intersection of communication technology (particularly mobile communication technology and social robots), interpersonal relationships, culture, and fashion studies. She has been an active researcher and collaborator in her field and has given numerous conference presentations and talks including TEDx Lugano. Her work has appeared in edited books and academic journals such as New Media and Society, First Monday, and International Journal of Social Robotics. She is a member of euRobotics topic group "Socially Intelligent Robots and Societal Application," and currently examining the case of social robot "Pepper" in Japan. Recent publication: The automation of taste: A theoretical exploration of mobile ICTs and social robots in the context of music consumption. *International Journal of Social Robotics*, 407-416 (2015, with Nello Barile)

HIRONORI MATSUZAKI

Name Hironori Matsuzaki

Affiliation Dept. of Social Sciences, University of Oldenburg, Germany

Title **Sense of Social Atmosphere (kūki) and Robots that Should Read the Situation**

Session Session 10: Perceptions of Social Robots

Time and location Friday, October 21, 15:30-16:00; Auditorium B

Abstract

Service and personal care robots are starting to cross the threshold into the wilderness of everyday life, where they are supposed to interact with inexperienced lay users in a changing environment. In order to function as intended, robots should become independent entities that monitor themselves and improve their own behaviours based on learning outcomes in practice. This poses contradictory challenges to robotics, which can be described as "autonomy-safety-paradox". The integration of robot applications into society requires the reconciliation of two conflicting aspects: increasing machine autonomy and ensuring safety in end-use. As the level of robot autonomy grows, the risk of accidents will increase. Emphasizing safety, however, impairs the autonomous functioning of the robot. In Japan, the solution to this problem is to obscure the idea of the autonomy of a technological entity. Instead of seeing the robot as an individual entity, a strong emphasis is placed on safe implementation of relational structures, which are derived from interhuman relationships. This paper aims to provide an insight into the Japanese concepts of "appropriate" user-robot interaction, by focusing on the notion of *kūki* literacy. In order to become safe partner-like existence, a robot should be built in such a way that even beginners can intuitively grasp how it works and start to use it right from the first day. To that end, it is necessary that its agency be embedded into the local interaction frame. My empirical data suggest that acquisition of the ability to sense social atmosphere (*kūki*) is considered a precondition for a robot being "japanized".

About the speaker

Main research interest: study on social construction of man-machine distinctions from perspective of Philosophical Anthropology comparative ethnographic analysis of ELS issues of robotics.

Publications:

- Matsuzaki, H. (2016): Robots, Humans, and the borders of the Social World. In: Nørskov, M. (ed.), *Social Robots: Boundaries, Potential, Challenges*. Farnham: Ashgate, pp. 157-176
- Matsuzaki, H./Lindemann, G. (2015) The Safety-Autonomy-Paradox of Service Robotics in Europe and Japan – A Comparative Analysis, *AI & Society.* DOI: 10.1007/s0014601506307
- Lindemann, G./Matsuzaki, H. (2014): Constructing the robot's position in time and space – the spatiotemporal preconditions of artificial social agency, *STI Studies* 10(1): 85-106

KAROLINA ZAWIESKA

Name Karolina Zawieska, PhD

Affiliation Industrial Research Institute for Automation and Measurements PIAP

Title **Human-Animal Analogy in Human-Robot Interaction**

Session Session 10: Perceptions of Social Robots

Time and location Friday, October 21, 16:00-16:30; Auditorium B

Abstract

This paper focuses on the concept of the human being and anthropomorphism developed in Human-Robot Interaction (HRI) research. The underlying assumption is that robot users are often viewed as organisms who respond 'automatically' to anthropomorphic cues provided by the robotic systems rather than assign meanings to the robot's appearance and behaviour. This has fundamental consequences not only for how one conceives anthropomorphic robot design but also and above all for how one understands humanness. While one could expect that the human being will be compared to the machine, the underlying assumption in this paper is that such an approach is largely shaped by the human-animal analogy. Thus, this paper employs the symbolic interactionist perspective to discuss the main factors contributing to the analogies between humans and animals in HRI research. The ultimate goal is to challenge the human-animal analogy and the dehumanisation it generates in and outside the HRI field.

About the speaker

Karolina Zawieska is a social scientist in the world of robotics. With her background in sociology and applied social science, she obtained her PhD degree in Inclusive Design & Creative Technology Innovation from the University College Dublin (UCD), Ireland. She is a Research Assistant at the Industrial Research Institute for Automation and Measurements PIAP, Poland. Her research interests include a variety of social and cultural aspects of social robotics and Human-Robot Interaction, in particular the concept of anthropomorphism. She has also been actively involved in international debates on ethical implications of the use of autonomous robotic systems.

WORKSHOPS TALKS

Workshop 1: Artificial Empathy
Workshop 2: Co-Designing Child-Robot Interaction
Workshop 3: Human-Robot Joint Action
Workshop 4: Robots in the Wild
Workshop 5: Artificial Phronesis
Workshop 6: Responsible Robotics

WORKSHOP 1: ARTIFICIAL EMPATHY

Name

Luisa Damiano, Assoc. Professor (1)
Paul Dumouchel, Professor (2)
Hagen Lehmann, Researcher (3)

Affiliation

University of Messina, IT (1).
Ristumeikan University, JP (2).
Italian Institute of Technology, IT (3).

Title

Workshop 1: Artificial Empathy

Time and location

Monday, October 17, 13:15-16:15; Seminar Room A

Abstract

This is the fourth in a series of workshops held at international conferences (i.e., ICSR 2012; ICDL-EPIROB 2013; ALIFE14) to explore a central issue in contemporary research on social robots: the problem of creating agents able to participate competently in affective exchanges with human partners. Current scientific inquiry on artificial empathy and emotion is stimulated by a network of questions arising in different fields, such as Affective, Cognitive, Developmental and Social Robotics, HRI, Philosophy and Epistemology, Cognitive, Anthropological, Social and Ethical Sciences. Among these issues are the theoretical problems of defining how "natural" emotions could be implemented in "artificial" agents. Can these agents "experience" emotions, or only "express" them? Are there conditions in which we can consider artificial agents as partners in emotional and empathic relations? Questions like these are inseparable from the issues related to the implementation of theoretical models in our social environments. Which are the current implementable models? Which are the targeted social environments? What are the implications and the results? These questions inevitably involve problems connected to anthropological, social and ethical aspects of artificial empathy.

FRANCO MOLTENI

Name Franco Molteni, MD

Affiliation Department of Rehabilitation Medicine, Valduce Hospital, Villa Beretta Rehabilitation Neurorehabilitation Center in Costa Masnaga, Italy

Title **Wearable Robotics and Gait Training after Stroke**

Session Workshop 1: Artificial Empathy

Time and location Monday, October 17, 13:15-13:45; Seminar Room A

Abstract

The talk will explore the implications of the interaction between patients and wearable exoskeletons during robotic gait training for stroke rehabilitation focusing on the patients' affective experience. Human gaits are the various ways in which a human can move, either naturally or as a result of specialized training. Post stroke gait disturbance and related disabilities are a common problem. Much effort goes into helping these patients to regain the ability to walk at least at home. In recent years, powered wearable exoskeletons, used to perform over-ground gait training in neurological patients, have been developed. This way, stroke survivors are empowered to perform a high number of task-oriented repetitive movements. The patient-robot interaction is crucial to produce the best gait pattern. The experience of the patient – and in particular, emotion, motivation, and sensory integration – during over-ground robotic gait training offers a different way of thinking to sensory feedback, effort and sense of agency produced by the assisted gait pattern.

About the speaker

Education/Training – Institution and location: University of Milan
Medical Degree: 1981/ Certified in PM and Rehabilitation 1984

Positions

- Director of the Department of Rehabilitation Medicine, Valduce Hospital, Villa Beretta Rehabilitation Neurorehabilitation Center in Costa Masnaga, Italy (2004 to present)
- Director of Gait and Motion Analysis Lab at Valduce Hospital (2000 to present)
- Scientific Director of Valduce Foundation Rehabilitation Research Programs (1998 to present)
- HEAD (Human Empowerment Aging and Disability): 2014-2017
- INCOGNITO (Integrated cognitive, sensory, and motor rehabilitation of hand functions) 2014-2017
- RETRAINER 2014- 2017
- Professor at University of Padua : Residency Program PM&Rehab (2014 to present)

NADIA BIANCHI-BERTHOUZE

Name

Nadia Bianchi-Berthouze
Professor in Affective Computing and Interaction

Affiliation

UCL Interaction Centre (UCLIC), University College London (UCL), United Kingdom

Title

Affective Body Expression: Perception, Automatic Recognition and Affect Modulation

Session

Workshop 1: Artificial Empathy

Time and location

Monday, October 17, 13:45-14:15; Seminar Room A

Abstract

Recent years have seen the emergence of technology that involves, requires and allows its users to be engaged through their body. This has made it possible to better exploit and understand this modality to capture, respond to and regulate users' affective experience and also to widen the set of channels for human-robot interaction. I will report on our studies aimed at using this modality to induce and recognize affective states in users interacting with technology. Through different studies and contexts, I will present our current understanding of how people perceive and express affect through body movement and touch behaviour. In doing so, I will also present our work on automatic recognition of naturalistic affective body expressions in computer games, laughter in dyadic interaction and pain-related emotions in physical rehabilitation. Finally, I will discuss challenges and opportunities for empathic interaction in the context of chronic pain.

About the speaker

Nadia Bianchi-Berthouze is Professor in Affective Computing and Interaction. Her main area of expertise is the study of body movement and touch as modalities for recognising, modulating and automatically measuring human affective states in HCI. She has investigated the above questions in various contexts including full-body games and technology for physical rehabilitation (e.g., EPSRS Emo&Pain, EU F7 ILHAIRE, H2020 HUMAN, EPSRC Digital Sensoria, Wellcome Trust HOLD). She has published more than 170 papers in affective computing, HCI, and pattern recognition. She was awarded the 2003 Technical Prize from the Japanese Society of Kansei Engineering and she was invited to give a TEDxStMartin talk (2012).

ANTONIO CHELLA

Name Antonio Chella, Professor

Affiliation Dipartimento dell'Innovazione Industriale e Digitale,
Università di Palermo, Italy
and
Istituto di Calcolo e Reti ad Alte Prestazioni, Consiglio Nazionale delle Ricerche,
Palermo, Italy

Title **Robots as Empathic Mediators: Experiences with Autistic Children**

Session Workshop 1: Artificial Empathy

Time and location Monday, October 17, 14:15-14:45, Seminar Room A

Abstract The talk discusses and summarizes the experiments concerning the project "Robotics and Autism," jointly conducted by the RoboticsLab of the University of Palermo and the ASD experts of the Italian regional health service (ASP6 Palermo). The project aimed to experience and compare the employment of the humanoid robots NAO and Telenoid as empathic mediators. Experiences were conducted with ASD children, at the age of 11, in a middle school in Palermo. The objectives of the project were the assessment of humanoid robots on the interaction and social integration among ASD children and the schoolmates. Several sessions were conducted during a period of three months. Notably, one of the ASD children, initially less fluent, shown significant interest in the Telenoid robot. Towards the end of the project, he took on the initiative and appeared as the initiator of group interactions with classmates. Another ASD child, bold and prevaricating, during interactions with the NAO robot, was adequate to the model of interaction with peers. In conclusion, the preliminary results of this study are encouraging in taking into account the humanoid robots as empathic mediators for ASD children.

About the speaker Antonio Chella is a Professor of Robotics at the University of Palermo, Italy. He is the Director of the Robotics Lab at the Department of Industrial and Digital Innovation of the University of Palermo. He is an associate at the Robotics Lab at the ICAR-CNR, Palermo. The main research expertise of Prof. Chella is on robot consciousness, cognitive robotics and robot creativity. Prof. Chella is the author of more than 200 scientific publications. Currently, he is the Editor in Chief of the Book Series on Machine Consciousness (World Scientific) and an Associate Editor of the BICA Journal (Elsevier). He is a coauthor of the book "Artificial Consciousness" (Imprint Academic, 2007) considered a reference in the field.

LOLA CAÑAMERO

Name Lola Cañamero, Reader in Adaptive Systems

Affiliation Head of the Embodied Emotion, Cognition and (Inter-)Action Lab, School of Computer Science, University of Hertfordshire, U.K.

Title **Empathy and Embodied Affect in Autonomous Robots**

Session Workshop 1: Artificial Empathy

Time and location Monday, October 17, 15:15-15:45; Seminar Room A

Abstract "Empathy" is often regarded as a cognitive ability to understand and share the feelings of another, and opposed to "sympathy" as being the affective capability of "feeling with" another, and more specifically to have feelings of pity and sorrow for someone else's misfortune.
Drawing on a view of empathy as a family of phenomena rather than on such clear-cut distinctions, and on an embodied approach to cognition, affect and robotics, in this talk I will discuss and illustrate some of the underlying mechanisms and capabilities that autonomous robots need to be "empathic" to various extents, and how they relate to different conceptualizations of "empathy". I will conclude with some speculation on how such empathic capabilities might affect our views of and relationships with autonomous robots.

About the speaker Lola Cañamero is Reader in Adaptive Systems and Head of the Embodied Emotion, Cognition and (Inter-)Action Lab in the School of Computer Science at the University of Hertfordshire in the U.K, which she joined as faculty in 2001. She holds undergraduate (Licenciatura) and postgraduate degrees in Philosophy from the Complutense University of Madrid and a PhD in Computer Science (Artificial Intelligence) from the University of Paris-XI (1995). She turned to Embodied AI and robotics as a postdoctoral fellow in the groups of Rodney Brooks at MIT and of Luc Steels at the Free University of Brussels. Since then, her research investigates the interactions between motivation, emotion, and embodied cognition and action from the perspectives of adaptation, development and evolution, using autonomous and social robots and artificial life simulations. A pioneer in the area of embodied emotions in robots, she is author and co-author of over 150 peer-reviewed publications, has led and participated in various international research projects in this field, and led different community-building and dissemination events. Website: www.emotion-modeling.info.

WORKSHOP 2 CO-DESIGNING CHILD-ROBOT INTERACTION

Name

David Robert, Teaching Fellow
Victor van den Bergh, Research assistant

Affiliation

Center for Children's Speculative Design, US

Title

Workshop 2: Co-Designing Child-Robot Interaction

Time and location

Tuesday, October 18, 13:00-16.30; Seminar Room A

Abstract

This workshop at Robophilosophy 2016 will explore approaches for designing robots for children that incorporate the needs and preferences of children, themselves. An interdisciplinary panel of speakers with experience in the theory and practice of child-robot interaction (CRI) will present their work and ideas, specifically where these speak to the experiences of children and lessons learned about their preferences for social interactions with robots in various domains (e.g. the educational context). Critical issues regarding the ethics of child-robot interaction will be discussed and consideration will be given to appropriate methods of inquiry and research in CRI. This workshop will also include a facilitated, group thought experiment and activity that bridges the imaginations of children and adults leading towards recommendations for all those concerned with the ethical design of child-robot interactions.

VICTOR VAN DEN BERGH, DAVID ROBERT AND NADEZHDA ZILBERMAN

Names

Victor van den Bergh, Co-Founder
David Robert, Co-Founder
Nadezhda Zilberman

Affiliation

Center for Children's Speculative Design (C4CSD), United States of America

Title

Speculative Co-Design of Robots

Session

Workshop 2: Co-Designing Child-Robot Interactions

Time and location

Tuesday, October 18, 13:15-14:00; Seminar Room A

Abstract

The goal of this 30-minute talk will be to introduce workshop participants to a framework for co-designing robots with children and adults that uses children's imaginations as a starting point. We will share the processes and outcomes of three art and research programmes that have informed this approach, which is being developed by the Center for Children's Speculative Design (C4CSD). The instances to be discussed include an interactive exhibition and workshop held at a major US art museum (Peabody Essex Museum), a gallery exhibition at Harvard University, and an ongoing child-robot-interaction research study in Russia.

About the speakers

Victor van den Bergh is a Dutch-American educational researcher working on children's media and learning. He earned his Master's degree with a focus on Education Policy & Management at the Harvard Graduate School of Education and is a Co-Founder of the Center for Children's Speculative Design. His research and evaluation work to date have focused on the impact of new technologies and pedagogical techniques on children's learning and development, as well as appropriate methods for gathering feedback from these sensitive audiences, such as the Children's Openness to Interacting with a Robot Scale (COIRS) published at Ro-MAN 2014.

Nadezhda Zilberman is associate professor at Tomsk State University, Russia. She earned a Ph. D in Philology with a focus on interpersonal communication. She is currently exploring the linguistic and cognitive aspects of human-robot interaction at the laboratory of Digital humanities.

David Robert is a contemporary artist, teacher, and human-robot-interaction designer. During his graduate work at the MIT Media Lab's Personal Robots Group, David developed robotic media platforms for early childhood playful learning.

FRANZISKA KIRSTEIN AND RIKKE VOLDSGAARD RISAGER

Names

Franziska Kirstein, Human-Robot Interaction Expert
Rikke Voldsgaard Risager, Vice President of Innovation

Affiliation

Blue Ocean Robotics, Denmark

Title

Experiences from Long-Term Implementation of Social Robots in Danish Educational Institutions

Session

Workshop 2: Co-Designing Child-Robot Interactions

Time and location

Tuesday, October 18, 14:00-14:30; Seminar Room A

Abstract

Introducing social robots in educational institutions comes with many challenges with regards to the involved pedagogues, their available time and lack of technological skills as well as general technical issues such as poor internet connection. In this paper, we describe how Blue Ocean Robotics works with end-users in our Innovation Projects that focus on long-term implementation of social robots in Danish educational institutions.

About the speakers

Franziska Kirstein is Human-Robot Interaction Expert at Blue Ocean Robotics in Odense, Denmark. She has received her MA in Int. Business Communication & Communication Design from University of Southern Denmark. As a communication designer she explores design opportunities from a user-centered approach and is curious about how technology, especially robotics, can be made easier for users.

Rikke Risager is an expert in the field of robotics and education/welfare technology. With a BA. of Education and a Dipl. in Educational Psychology, she is especially interested in social robotics for children with special needs, including children with ASD, ADHD and other developmental disorders. One of her core competences is the focus on creating a secure, rich and stimulating learning environment in an inclusion agenda.

Blue Ocean Robotics is a creator of emerging robotic solutions, -enterprises & -markets and was recently recognized as one of the 20 Most Promising Robotics Solution Providers of 2016 by CIOReview. Blue Ocean Robotics deploys new solutions in close cooperation with end-users in different market segments and develops the solution according to the end users' needs.

WORKSHOP 3 HUMAN-ROBOT JOINT ACTION

Names

Aurélie Clodic, Research Engineer (1)
John Michael, Assistant Professor (2)

Affiliations

(1) Université de Toulouse, CNRS, FR
(2) University of Warwick, UK, and Central European University, HU

Title

Workshop 3: Human-Robot Joint Action

Time and location

Tuesday, October 18, 13:00-16:30; Auditorium C

Abstract

It is interesting to observe, from a roboticist point of view, that human-human joint action is a topic of intense research in cognitive psychology and philosophy. This observation led us to implement a multi-disciplinary initiative to create a unique opportunity for scientific exchange through a series of workshops called "toward a Framework for Joint Action" (fja.sciencesconf.org). Psychologists and philosophers can present recent developments in joint action research, while roboticists are able to discuss the challenges they face with regard to human-robot interaction and more precisely human-robot joint activity. For this sixth edition, we will focus on Commitment and agency management in joint action. Robots are becoming increasingly flexible agents, able to perform a broader range of actions in diverse contexts, and to adapt their actions to coordinate with human co-actors. This increasing flexibility brings with it new challenges: the more flexible a robot agent is, the more uncertainty a human agent may have about how the robot is going to act. Moreover, robots have to identify and keep track of various action options, and to prioritize some action options. In meeting this challenge, roboticists have been developing various capacities and features that facilitate predictability and communication, from eye gaze and kinematics, to emotional expressions and responsiveness to human emotional expression. In addition, some researchers have worked on higher-level cognitive features, such as the sense of commitment, which may lead robots to resist distraction or alternative action options, and may lead humans also to expect robots to do so, and thus to be willing to rely upon robots. The current workshop will aim towards the articulation of goals and benchmarks toward which this research aims.

FRANCESCA BONALUMI

Name Francesca Bonalumi, PhD student

Affiliation Department of Cognitive Science, Central European University, Budapest, Hungary

Title **Psychological Foundations of Commitment**

Session Workshop 3: Human-Robot Joint Action

Time and location Tuesday, October 18, 13:40-14:05; Auditorium C

Abstract Investigating commitment from a psychological perspective entails dealing with a major challenge: to understand which are the minimal conditions that trigger a feeling of commitment and the understanding that a potential partner is committed. We claim that by committing, an agent influences the expectations of her partner, engages her own social dispositions, and implicitly accepts to put herself in a position of being accountable for any potential defection. The empirical way to assess whether a commitment to do X is made is to measure the committed agent's tendency to do X in spite of some material benefits for not doing X, and moral disapproval from her partner if she does not do X: these measures are made by presenting to participants several hypothetical situations in which elements such as the intentions of the committed agent, the consequences of her not doing X or the common knowledge of expectations vary. We test the hypothesis that the level of moral disapproval of an agent when a commitment is broken by a partner depends not only on the consequences of the breaking, but also and decisively on the perceived intentions of the partner, and her concrete attempts to prevent or minimize the loss that the agent is bound to suffer. Furthermore, we test the hypothesis that moral disapproval is not decisively sensitive to whether an agreement is explicit but whether there is common knowledge about the expectations of the agents.

About the speaker I graduated in Philosophy in Milan with a thesis on the normative implications of research in moral decision-making, and those interests led me to join the PhD program in Cognitive Science at CEU. My major interest concerns how people make prosocial decisions, and in particular how interpersonal commitments affect these decisions, how people understand and are motivated to commit with others.

RAJA CHATILA

Name Raja Chatila, Senior Researcher

Affiliation Sorbonne Universités, UPMC University Paris 06 and CNRS - UMR 7222, Institut des Systèmes Intelligents et de Robotique, F-75005, Paris, France.

Title **Human-Robot Interaction: Needs and Limits**

Session Workshop 3: Human-Robot Joint Action

Time and location Tuesday, October 18, 14:05-14:30; Auditorium C

Abstract The field of human-robot interaction is flourishing, enabled by new results in several areas such as perception, manipulation, action planning and control, inspired by theories about human-human interaction, and pulled by new needs for social or collaborative robots.
The broad area of cognitive HRI addresses challenging issues such as detecting facial expressions and emotions, exhibiting emotions, understanding social signals such as postures and gestures, interpreting human activities and behaviors, detecting and reasoning on intentions, perspective taking, space sharing, cooperative and joint action planning and execution, etc. Several projects target specifically humanoid or android robots, motivated by the belief that such robots would be able to achieve more natural interactions with humans because their shape facilitates easier imitation of human gestures and expression of emotions.
We shall overview a few of these cognitive capacities and consider their actual level of development, discussing how much they can actually be operational in the HRI context.

About the speaker Raja Chatila's research work covers several aspects of autonomous and interactive Robotics such as robot navigation, motion planning and control, cognitive and control architectures, human-robot interaction, and robot learning. He works in projects in the areas of service, field and space robotics. He is author of over 150 international publications on these topics.

AURÉLIE CLODIC AND RACHID ALAMI

Names CLODIC Aurélie (Research Engineer), ALAMI Rachid (Senior Researcher)

Affiliation LAAS-CNRS, Université de Toulouse, CNRS, Toulouse, France

Title **Commitment Management in Human-Robot Joint Action – An Overview**

Session Workshop 3: Human-Robot Joint Action

Time and location Tuesday, October 18, 15:00-15:25; Auditorium C

Abstract In this talk, we will review some already existing works concerning commitment management in human-robot joint action. Which aspects have been taken into account and how. For example how commitment to do an action together is obtained at the beginning of an interaction. Which tools have been used to mediate this important aspect of joint action and how it is handle alongside during the action.

About the speaker Aurélie Clodic is a Research Engineer at LAAS-CNRS. She received a PhD in robotics in 2007 for which she elaborated and implemented ingredients for human-robot joint activity in several contexts (robot guide in a museum, robotic assistant in the framework of the COGNIRON project). Her research interest includes human-robot collaborative task achievement and robotics architecture design (focused on decision-making and supervision) dedicated to HRI. She is the main investigator of a workshop series dedicated to joint action ("toward framework for joint action", fja.sciencesconf.org)

Dr. Rachid Alami is Senior Scientist at CNRS. He received an engineer diploma in computer science in 1978 from ENSEEIHT, a Ph.D in Robotics in 1983 from Institut National Polytechnique and an Habilitation HDR in 1996 from Paul Sabatier University He contributed and took important responsibilities in several national, European and international research and/or collaborative projects (EUREKA: FAMOS , AMR and I-ARES projects, ESPRIT: MARTHA, PROMotion, ECLA, IST: COMETS, IST FP6 projects COGNIRON, URUS, PHRIENDS, and FP7 projects CHRIS, SAPHARI, ARCAS, SPENCER France: ARA, VAP-RISP for planetary rovers, PROMIP , ANR projects). His main research contributions fall in the fields of Robot Decisional and Control Architectures, Task and motion planning, multi-robot cooperation, and human-robot interaction. Rachid Alami is currently the head of the Robotics and InteractionS group at LAAS.

JOHN MICHAEL

Name John MICHAEL, Assistant Professor

Affiliation Department of Philosophy, University of Warwick
Coventry, United Kingdom
&
Department of Cognitive Science, Central European University
Budapest, Hungary

Title **The Sense of Commitment in Human-Robot Interaction**

Session Workshop 3: Human-Robot Joint Action

Time and location Tuesday, October 18, 15:25-15:50; Auditorium C

Abstract There is a vast potential for robots to assist humans in joint actions in many different domains, from disaster relief to health care, education, and manufacturing. As roboticists move forward in optimizing human-robot interactions in order to tap this potential, it may be fruitful to consider one particular question pertaining to the challenge of designing robots with whom humans can interact comfortably and productively in various kinds of joint action. Specifically: Is it possible to design robots that elicit and/or exhibit a sense of commitment – i.e. such that (i) humans agents are motivated by a sense of commitment toward them, (ii), human agents expect them to be motivated by a sense of commitment toward human agents, (iii) they are motivated by a sense of commitment toward human agents, and/or (iv) they expect human agents to be motivated by a sense of commitment toward them.

About the speaker John studied philosophy at Wesleyan University (Connecticut, USA), then at the University of Tübingen (Germany), and completed his PhD at the University of Vienna in 2010. After working as a post. doc in cognitive science at Aarhus University and Copenhagen University (Denmark), he joined the Department of Cognitive Science at the Central European University (CEU) in Budapest as a Marie Curie Research Fellow. He is currently an assistant professor at the Warwick University philosophy department and an affiliated researcher in the CEU in Budapest. His research is supported by an ERC starting grant to investigate the sense of commitment in joint action.

HENRY POWELL

Name Henry Powell

Affiliation University of Warwick, UK

Title **Commitment, Cooperation, and Coordination in HRI**

Session Workshop 3: Human-Robot Joint Action

Time and location Tuesday, October 18, 15:50-16:15; Auditorium C

Abstract

Commitments are often thought to be instrumental in galvanising certain kinds of human social activity. Specifically, they are thought to play essential roles in the coordination and cooperation of individuals that makes group activity as effective as it is. It is, however, not entirely clear how exactly these three things are supposed to fit together. That is, what kinds of relations we should understand there to be between commitment, coordination, and cooperation – if any at all. Resolving this problem has obvious benefits, not only in allowing us to understand the structure of these kinds of human interactions but also by providing us the grounds from which we might be able to engineer similarly effective interactions between humans and robots. In this response I would like to raise some questions about how commitments should be thought to fit into our understanding of both coordination and cooperation and similarly, how coordination and cooperation should be thought to fit into one another. Having done this, I will consider how understanding the relation between commitment, cooperation, and coordination might benefit the development of robots designed to interact with humans in social, palliative, and industrial spheres.

About the speaker

Henry Powell is a PhD candidate at the University of Warwick in the UK. His research concerns joint action, cognitive science, and HRI and aims to develop a minimal account of joint action that can assist in engineering beneficial relationships between robots and humans as well as providing a novel challenge to conventional accounts of human/human as well as human/robot interactions.

WORKSHOP 4
ROBOTS IN THE WILD

Names

Maja Hojer Bruun, Assoc. Professor (1)
Cathrine Hasse, Professor (2)

Affiliation

(1) Department of Learning and Philosophy, Aalborg University, DK
(2) Department of Education, Aarhus University, DK

Title

Workshop 4: Robots in the Wild

Time and location

Wednesday, October 19, 13:00-16.30; Seminar Room A

Abstract

Our workshop will focus on questions that emerge after studying robots in the wild. We will discuss the difference between studying robots emerging as phenomena in the wild and robots in controlled laboratory settings and how these three dimensional robots differ from the two-dimensional robots encountered in games and movies. Engaging with robots in the wild apparently puts considerable demands of more or less collaborative learning and engagements on humans. We will raise the following questions: How is that which constitutes 'the social' and meaningful social interaction re-configured in different ways through human-robot interaction? How do robots affect ongoing social practices and vice versa? What kind of learning is involved? Are there cultural differences in how we learn to engage with robots? How are the material instantiations of robots developed in one cultural context (e.g. Japan) transposable to another (e.g. Denmark)? How do our empirical studies of robots in the wild differ from media studies and robot experiments in laboratories, and how do they challenge common conceptions about robots and autonomy? When, where, and why do humans accept or reject robots in the wild? Based on our studies of robots in the wild, what kind of challenges do we foresee for 'robot societies' of the future?

We will discuss our findings of ethnographic studies of robots like Nao, Paro, and Silbot in different institutions. Does the discourse associated with 'wild' robots like e.g. Nao make use of technical terms that might exclude new robot-users, or do the robots come with a language that glosses over and simplifies how demanding it is to get a robot like Nao to work? The empirical material presented involves cultural diversity in how we engage with robots (e.g. in Denmark, Finland and Japan) as well as in the way robots affect and are affected by ongoing social practices. During the workshop selected participants will be invited to get first hand experiences with the robot Nao.

CHRISTINA LEESON

Name Christina Leeson, PhD student

Affiliation Department of Anthropology, University of Copenhagen, Denmark

Title **Did You Forget Your Feet at Home? Humanoid Robots as Truly Peculiar Traps**

Session Workshop 4: Robots in the Wild

Time and location Wednesday, October 19, 13:10-13:30; Seminar Room A

Abstract

This paper shall take its point of departure in the idea of sociable robots now introduced around the world in the guise of artificial pets and humans, promising to be lovable, caring and responsive beings in the everyday life of people. Based on ethnographic studies in a Japanese robotics laboratory and in nursing homes and activity centres in Denmark, I wish to explore how robots crafted in the image of human beings work to trap the mind and imagination of others, as they travel from the laboratory to the daily life of people. Drawing on the idea of entrapment proposed by anthropologist Alfred Gell, this paper explores how robots are strategically crafted and set to entice and seduce people, through their aesthetic qualities and abilities to create specific moments of brilliance that dazzle people and pose an extraordinary experience to be valued in itself. Yet, I propose that analysing the entrapping capacity of humanoid robots illuminates the fragility and interdependence of these figures, which, in order to enchant anyone, depend also on dedicated people to care for their on going social life. From an anthropological perspective, it is argued that the capacity of being 'enchanting' is as much a matter of how they are crafted and designed as it is about how they are arranged when encountering people in their daily life.

About the speaker

My main research area is the emergence of so-called 'social robots' in the everyday life of older and disabled people in Japan and Denmark.

Publications:

- Beyond Determinism : Understanding Actual Use of Social Robots by Older People. / Neven, Louis ; Leeson, Christina Algreen-Petersen Aging and the Digital Life Course . red. / David Prendergast; Chiara Garattini. Berghahn Books, 2015.
- Velfærdsteknologi - Fra ambitiøse visioner til praksis i ældreplejen. / Leeson, Christina Algreen-Petersen. Tidsskriftet Gerontologi , Nr. nr. 4, 2012.
- Mennesker mellem robotter. Robotter mellem mennesker. Om materialitet og socialitet i det japanske samfund. / Leeson, Christina Algreen-Petersen. 2010

LASSE BLOND

Name Lasse Blond, PhD Fellow, MSc & MA.

Affiliation Department of Digital Design and Information Studies, University of Aarhus, Denmark.

Title **Travelling Robots and Their Cultural Baggage**

Session Workshop 4: Robots in the Wild

Time and location Wednesday, October 19, 13:30-13:50; Seminar Room A

Abstract

Socially assistive robots are seen as assets when envisaging the future of health- and social services in Nordic welfare societies. The South Korean robot Silbot was transferred to Danish and Finnish nursery homes to test its' potential of treating or slowing down the progression of dementia among elderly citizens by engaging them in interactive cognitive exercises. This was done with various results. Transfer of technology is too often thought of as a matter of relocating hardware. The import of robots from Asia to Europe challenges this comprehension - as these robots are more than a piece of hardware; they bring along with them cultural baggage of a foreign sociotechnical imaginary. In the case of Silbot the effort to adopt the robot to the Finnish and Danish social services exposed unfamiliar and cultural-dependent views of care, cognition, health and human nature.
Studying Silbot in "the wild" in Denmark highlighted these issues as well as shedding light on the human-robot interaction and the effort of adopting the robot to real life praxis. This empirical study of the mixture of human and automated machines highlights the importance of comprehending robots as parts of sociotechnical ensembles and to observe how humans get along with our technology. The study of Silbot in its' natural setting asks profound philosophical questions about robotics, autonomy and the mediating role of new technologies. However, this case also emphasizes the importance of understanding technology transfer, and the transfer of robots in particular, as a two-way interaction consisting of technology shaping culture and just as important the cultural shaping of technology.

About the speaker Lasse Blond is a PhD Fellow at Aarhus University at the Centre for Science and Technology Studies (STS) where his work is focused on the use and adaptation of robots into real life praxis - especially in health and elderly care. His research interests include social studies of robotics, human-robotic interaction and the sociotechnical imaginaries of employing robots in public service.

BIRGITTE HALLE AND MICHELLE NIELSEN

Names

Birgitte Halle, Project manager, Occupational Therapist
Michelle Nielsen, Project manager, Dipl. Ing. Healthcare Technology

Affiliation

Center for Assisted Living Technology, Health & Care, City of Aarhus

Title

Practical Experiences by Using Robots

Session

Workshop 4: Robots in the Wild

Time and location

Wednesday, October 19, 13:50-14:10; Seminar Room A

Abstract

Because of the demographic challenge, the municipalities in Denmark have to think in new directions to keep the welfare of today. The number of elderly is rising, the average age is rising, the amount of elderly with dementia is rising, and at the same time we have less young ones, who can help. Is it possible to change this development with assisted living technology? This is, what Center for Assisted Living Technology in the Municipality of Aarhus is working with. There is quite a lot research in this area, but researching is a long term process, and we need a development of solutions now. Center for Assisted Living Technology has therefore started projects to test different types of robots and technologies in a practice near context, where both qualitative and quantitative data will be evaluated for future use for the implementation in the municipality.
Our projects/tests consist of two steps, first a small test and then a bigger one. Our work focuses on citizens, who constantly are in development and is not a homogenous target group. During the test we get knowledge of the possibilities of the robot, and we learn which groups the robot best is suitable for. We also examine which competences the employees need for using the robot. The frame contents and conditions are changing during the test – therefore we adjust the test constantly in an iterative process. After the first test, we are using the results and experience for doing a more concrete evaluation in a setup, where the experience can be validated.

About the speakers

Birgitte Halle is educated Occupational Therapist and certified PRINCE2 project manager. Birgitte has many years of experience within test and implementation of different types of helping aids in a real life context. She has in the last 6 years been specialized in the area of assisted living technology including social robots in a practice near context.

Michelle Nielsen received a B.Eng. degree in Healthcare Technology from Aarhus University School of Engineering in January 2014. Since graduating in 2014, Michelle has been working there as engineer and certified PRINCE-2 project manager at Center for Assisted Living Technology. Michelle's main area of interest is use of technology and especially robots for care and rehabilitation.

MIA KROGAGER MATHIASEN

Name Mia Krogager Mathiasen, cand.scient.anth.

Affiliation Graduated from Department of Anthropology, Aarhus University

Title **A Preview of Parenthood. An Anthropological Study of the Use of Infant Robots in Danish Municipalities.**

Session Workshop 4: Robots in the Wild

Time and location Wednesday, October 19, 15:00-15:20; Seminar Room A

Abstract

The dream of becoming a parent in an early stage of life is particularly prevalent among young vulnerable people in Danish society. This is due to the notion that a child will change their lives for the better, in reality this is often not the case. The local authorities have to intervene more frequently in cases with marginalised young parents than in other cases in society. In consequence, a growing number of Danish municipalities have in recent years acquired technological infant simulators: baby robots designed to give young adults a preview into the future of parenthood. But how do local government workers use robot technology to impact the decision-making process about parenthood among young vulnerable people? Based on three months of ethnographic fieldwork in the municipality of Svendborg during 'clarification programs' with nine young people, the paper shows how the infant simulator paves the way for a new social reality, in which the participants can explore the 'possible in the actual' through a pre-enactment of their potential futures as parents. However, the simulator's agency, consisting of it's ability to generate new reflection among the caretakers in the nursing process, requires that certain relations between the human and non-human actors in the social network are present (Latour 1992). The effect of the infant simulator is generally seen as a postponement or abandonment of the future as a parent among the young participants. Hence, questions of ethics and technology-use is strongly embedded in the municipal 'model of solution' (Jöhncke et al. 2004) with infant simulators.

About the speaker

Master thesis: "A preview of parenthood. An anthropological study of infant simulators as a technological phenomenon in Danish municipal context"

My professional curiosity deals in particular with questions about, how technologies can be used strategically to affect behavior and processes of decision-making. This includes discussions regarding ethics, politics and innovation in connection with design and use of technologies and robots.

MAJA HOJER BRUUN

Name Maja Hojer Bruun, Associate Professor

Affiliation Department of Learning and Philosophy, Aalborg University, Denmark

Title **A Place for Robots in Health Care Sociality?**

Session Workshop 4: Robots in the Wild

Time and location Wednesday, October 19, 15:20-15:50; Seminar Room A

Abstract

How do people who work in the health care sector perceive the new robots that come into their work life and the life of patients and citizens? How do they categorize social robots and other new technologies? How do they imagine the future with robots and what do they see as challenges, opportunities and threats? Which ethical questions arise from the encounters between humans and robots in the wild? From an anthropological perspective, ethical debates about what robots can and should do starts from situated experiences and local social relations. This paper is based in an anthropological fieldwork conducted in a Dansih rehabilitation centre where different types of welfare technology and social robots are tested. The paper asks what concepts of the social are at play in different human-technology interactions and what roles are envisaged for the robots. What social imaginaries and ideas about the social do the robots enter into?

About the speaker

Maja Hojer Bruun is Associate Professor in Applied Anthropology at the Department of Learning and Philosophy, Aalborg University where she teaches in the Techno-Anthropology Programme. Her research interests are in welfare technology, social robotics, STS, urban anthropology, organizations and political economy.

CATHRINE HASSE

Name Cathrine Hasse

Affiliation Department of Education, Aarhus University, Denmark

Title **Robot Learning - Posthuman or posthumanistic?**

Session Workshop 4: Robots in the Wild

Time and location Wednesday, October 19, 15:50-16:10; Seminar Room A

Abstract

This talk shall explore the concept of learning from the perspective of the robotizised posthuman. The vast majority of cognitive, behavioral and part of the constructionist learning theories operate with an autonomous individual who learn in a world of separate objects. Technology is (if mentioned at all) understood as separate from the individual learner and perceived as tools. Learning theory has in general not been acknowledging materiality in their theorizing about what learning is – and have not yet tied learning theory to posthuman perspectives.
Also it is time for a new world opening – after humans have found out the globe is just a small dot in a vast universe we have to learn more about how we learn to see ourselves a beings in a vast universe (Arendt 1948). Learning theory is I suggest the basic process that transform humans and have done so since Homo Sapiens Sapiens began its long journey towards what many now perceive as the posthuman. This movement is increasing merging the mechanics of robots with the organic human body. But how can we speak of posthumans before we know what a human is?
A new posthumanistic learning theory is needed to keep up with the transformations of human learning resulting from new technological experiences as well as new understandings of what it is to be human. I find is useful to combine postphenomenological and cultural-historical theories in this exploration of posthuman learning, acknowledging that unpredictable and complex technologies play an ever larger part in our cultural activities and our conceptual abstractions.

About the speaker

Cathrine Hasse is full professor at Aarhus University in Denmark at the department of Education. She is heading the research group Future Technologies, Culture and Learning engaging in research on educational technologies and global cultural learning processes. She was educated as an anthropologist, and has also studied physics education and physics and engineering research. In 2011-2015 was the co-ordinator of the research project Technucation on learning and technology and from 2016-2020 she is heading the EU project on robotics, REELER. She is the author of e.g. *An Anthropology of Learning: On Nested Frictions in Cultural Ecologies* (2015), an MC member in the COST action New Materialism: Networking European Scholarship on 'How Matter Comes to Matter' and active participant in the 4S network of Science and Technology Studies.

WORKSHOP 5
ARTIFICIAL PHRONESIS

Name Charles Ess, Professor

Affiliation Department of Media and Communication, University of Oslo, Norway

Title **Workshop 5: Artificial Phronesis**

Time and location Thursday, October 20, 13:00-16.30; Seminar Room A

Abstract

As social robots become increasingly sophisticated in both implementation and future designs and aspirations, they become correlatively central as both theoretical and empirical test-beds for an array of specifically ethical challenges and reflections. First of all, as these devices are endowed with ever greater capacities for autonomy, both ethicists and designers are forced to confront central questions of ethical responsibility and decision-making. Many approaches are driven by deontological and utilitarian considerations (e.g., the [in]famous Trolley problem as a model for programming [semi-]autonomous vehicles). But virtue ethics approaches are commanding more attention in recent years, especially in conjunction with care robots and sex bots, where human love and care are inextricably interwoven with emotions more broadly, and love and care are themselves understood as virtues, i.e., habits or practices of excellence that must be cultivated rather than assumed as a given in human nature (S. Vallor, A. van Wynsberghe., C. Ess). Virtue ethics foregrounds in particular the central role of phronesis as a form of reflective, situated moral intuition and judgment. For several reasons, some of us have argued that phronesis is not computationally tractable and thereby demarcates a primary limitation on the possibilities of creating and programming ethical robots (C. Ess, A. Gerdes). At the same time, human phronesis requires both embodiment and emotions, including love and care. Where genuine emotion and embodiment – as well as first-person phenomenal consciousness (S. Bringsjord) – likewise appear beyond the possibilities of AI and thus social robots, these further demarcate what may remain intransigent boundaries between humans and machines – where these boundaries in turn hold enormous implications for resulting human-machine communication, relationships, and ethics. Our panel brings together many of the leading philosophers and theorists in these debates, with the goal of further refining our understanding of human phronesis and how far an artificial phronesis (John Sullins) may be possible – with a broader view towards the ethical implications for designing, programming, and interacting with social robots, including carebots and sexbots.

SHANNON VALLOR

Name Shannon Vallor, William J. Rewak, S.J. Professor

Affiliation Department of Philosophy, Santa Clara University, USA

Title **Artificial *Phronēsis* as a Regulative Ideal in Robot Ethics**

Session Workshop 5: Artificial Phronesis

Time and location Thursday, October 20, 13:30-14:00; Seminar Room A

Abstract

Among all the virtues described in Aristotelian ethics, *phronēsis* is the most demanding, intellectually sophisticated, and psychologically complex, bringing together all of the human faculties that enable mature moral agency and expertise. A rare virtue even in humans (if Aristotle is correct), *phronēsis* integrates and expresses well-cultivated capacities of general moral understanding, situated moral perceptivity, appropriate emotional attunement, proper moral perspective, moral imagination and creativity, prudent deliberation, and moral choice. Artificial agents possess none of these faculties. The attempt to design ethical robots by producing a digital analogue of *phronēsis* may thus seem ludicrous on its face, akin to the creator of an automated legal aid program taking as a design specification the kind of legal wisdom typical of a Supreme Court Justice. What justification could there be for such hubris? I will briefly outline several possible justifications for an artificial *phronēsis* project, and the criticisms to which they are subject. I conclude with the most viable justification: the claim that while artificial *phronēsis* is materially unrealizable for the foreseeable future, it may still serve as a useful regulative ideal for robot ethics. Such an ideal can motivate and sustain healthy, constructive criticism of more practical and tractable design approaches, countering overly reductive and rigid thinking in the practice of machine ethics and robotics.

About the speaker

Shannon Vallor is the William J. Rewak, S.J. Professor in the Department of Philosophy at Santa Clara University, where her research and teaching focuses on the ethical implications of emerging science and technology, including AI, robotics and new media. Professor Vallor received the 2015 World Technology Award in Ethics from the World Technology Network. She is President of the international Society for Philosophy and Technology, and serves on the Executive Board of the Foundation for Responsible Robotics. She is the author of *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting* (Oxford University Press, 2016).

MARIAROSARIA TADDEO

Name Mariarosaria Taddeo, Oxford Faculty Fellow at the Alan Turing Institute

Affiliation Oxford Internet Institute, University of Oxford, UK

Title **Relying on Phronēsis to Understand Robot Ethics**

Session Workshop 5: Artificial Phonesis

Time and location Thursday, October 20, 14:00-14:30; Seminar Room A

Abstract

One can interpret *phronēsis* as the most human of the virtues, the one than more than others distinguishes humans from other beings. In modern term, one could say that phronēsis is what grounds human dignity. According to this view, 'artificial *phronēsis*' is an oxymoron, which leads to a provocative question, as to whether an artificial *phronēsis* is at all possible. As I believe that artificial *phronēsis* is implausible, in this talk I will address a different, but related, question focusing on whether we should aim at designing and deploying artificial agents able to exhibit *phronēsis* and autonomous moral decision-making progress or whether we should direct our efforts in shaping our social environment so to facilitate and solicit ethical behaviour from all the agents, whether human or artificial, existing in it. The goal will be to critically address the core problems posed by robot ethics, by switching the focus from building ethical machines to designing *just* societies.

About the speaker

My primary research interests are Information and Applied Ethics, Philosophy of Information, Philosophy of Technology, Information & Computer Ethics, Ethics of Cyber Conflicts and Cyber Security. I work at the Oxford Internet Institute, University of Oxford and I am one of the Oxford Faculty Fellows at the Alan Turing Institute. I am Junior Research Fellow of St Cross College, University of Oxford and visiting lecturer at the Department of Computer Science, University of Oxford. Until November 2014 I was Research Fellow in Cyber Security and Ethics – Politics & International Studies – University of Warwick. Prior my work at the University of Warwick, I held a Marie Curie Fellowship at the University of Hertfordshire working on Information Warfare and its ethical implications. I obtained a PhD (Doctor Europeus) in Philosophy at the University of Padua. My PhD thesis focused on the epistemic and ethical implications of the occurrences of e-Trust in distributed systems. I graduated in philosophy at the University of Bari with a MA thesis on the Symbol Grounding Problem

ANNE GERDES

Name Anne Gerdes, Associate Professor

Affiliation Department of Design and Communication, University of Southern Denmark, Denmark

Title **The Role of Phronesis in Robot Ethics**

Session Workshop 5: Artificial Phonesis

Time and location Thursday, October 20, 15:00-15:30; Seminar Room A

Abstract The Aristotelian concept of *phronesis* captures the kind of situated knowledge, which is needed in order for us to understand and act morally in the specific situations in which we find ourselves. On this background, it is discussed whether an 'as if' version of phronesis, understood as situational awareness, might enable us to design a virtuous robot with 'as if' capabilities of the *phronimos*. It is argued that eventually we might see this kind of virtuous robot, but its 'as if' qualities would not be sufficient for the virtuous robot to count as an ethical agent, since phronesis is presumably not computationally tractable.

bout the speaker Anne Gerdes is an Associate Professor at the Department of Design and Communication, University of Southern Den¬mark. She is Director of the Doctoral Programme in Design, IT and Communication. She teaches courses at the Faculty of Humanities and the Faculty of Engineering on value based design and ICT & Ethics at BA and MA level. Her research focuses on ICT and ethics, and in recent years, she has specialized in ethical issues related to robot ethics, particular dealing with lethal autonomous weapon systems.

Recent publications of relevance

Gerdes, A., & Øhrstrøm, P. (2015). *Issues in robot ethics seen through the lens of a moral Turing Test. Journal of Information, Communication and Ethics in Society*, 13(2), 98-109. DOI: 10.1108/JICES-09-2014-0038

Gerdes, A. (2015). *The Issue of Moral Consideration in Robot Ethics. Computers & Society (Online)*, 45(3), 274-280. DOI: 10.1145/2874239.2874278

Gerdes, A. (2014). Ethical Issues Concerning Lethal Autonomous Robots in Warfare. I J. Seibt, R. Hakli, & M. Nørskov (red.), *Sociable Robots and the Future of Social Relations*. (s. 277-289). IOS Press. (Frontiers in Artificial Intelligence and Applications, Vol. 273). DOI: 10.3233/978-1-61499-480-0-277

CHARLES MELVIN ESS

Name Charles Melvin Ess, Professor in Media Studies

Affiliation Department of Media and Communication, University of Oslo, Norway

Title **Phronēsis, Love, and "Complete Sex" (workshop)**

Session Workshop 5: Artificial Phonesis

Time and location Thursday, October 20, 15:30-16:00; Seminar Room A

Abstract

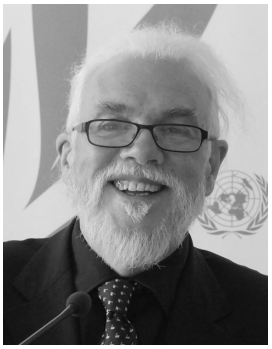
Social robots become increasingly central as both theoretical and empirical test-beds for an array of specific ethical challenges and reflections. Many approaches are driven by deontological and utilitarian considerations, such as the (in)famous Trolley problem as a model for programming (semi-) autonomous vehicles. But virtue ethics approaches are commanding more attention in recent years, especially in conjunction with care robots and sexbots, as human love and care are themselves understood as virtues. Moreover, virtue ethics foregrounds the central role of *phronēsis* as a form of reflective, situated moral intuition and judgment. For several reasons, some of us have argued that *phronēsis* is not computationally tractable and thereby demarcates a primary limitation on the possibilities of creating and programming ethical robots. Human *phronēsis* further requires both embodiment and emotions, including love and care. Where genuine emotion, embodiment, and first-person phenomenal consciousness likewise appear beyond the possibilities of AI and thus social robots, these further demarcate what may remain intransigent boundaries between humans and machines: these boundaries in turn hold enormous implications for resulting human-machine communication, relationships, and ethics.

Our workshop brings together several philosophers engaged in these approaches, with the goal of further refining our understanding of human *phronēsis*, with a broader view towards the ethical implications for designing, programming, and interacting with social robots, including carebots and sexbots.

About the speaker

Charles M. Ess works at the intersections of philosophy, computing, applied ethics, comparative philosophy, and media studies, with emphases in research ethics, Digital Religion, and virtue ethics in media and communication, including social robots. His publications include *Digital Media Ethics* (Polity Press, 2009, 2nd ed. 2013), (co-editor) *The Handbook of Internet Studies* (Wiley-Blackwell, 2012), and 'What's love got to do with it? Robots, sexuality, and the arts of being human,' in M. Nørskov (ed.), *Social Robots: Boundaries, Potential, Challenges*, 57–79 (Ashgate, 2015).

WORKSHOP 6
RESPONSIBLE ROBOTICS



Names

Aimee van Wynsberghe, Assistant Professor (1)
Noel Sharkey, Professor Emeritus (2)

Affiliation

University of Twente, NL (1)
University of Sheffield, UK (2)

Title

Workshop 6: Responsible Robotics

Time and location

Friday, October 21, 13:00-16:20; Auditorium C

Abstract

The phrase responsible robotics (RR) demands that the issues of responsibility for a given robot application be addressed at all stages of design (idea generation, prototyping, researching, development and implementation). Moreover, this phrase demands that the person responsible for the actions of the robot be made explicit at each of these developmental stages. The currency of the phrase does not stop there; it also demands that policy and law considerations fall under the umbrella of RR. Thus, RR has the potential to become a roadmap for the future of robotics, one that incorporates the many layers of the ethical, legal and societal issues. In short, our goal is to proactively address the multidimensional nature of robotics using the concept of responsibility and to provide coherence in order to move ahead in an interdisciplinary manner. The workshop will consist of two panels each with differing aims. The first will address questions concerning the conceptual and theoretical foundations for responsible robotics. For this we draw on the field of moral philosophy and highlight the works of Shannon Vallor, John Sullins, Peter Asaro, Raul Hakli, Pekka Mäkelä, and Arto Laitinen The second will build on the meta-ethical discussion and will center on the questions concerning the applied dimension of robotics. For this panel we have selected specific case studies and will address issues related to: urban robotics (Michael Nagenborg), drones used in the media (Deborah Johnson and Astrid Gynnild), the timing of creating policy and guidelines for drones in civil applications (Peter Novitsky), and a framework for ethical governance in robotics (Alan Winfield). In what follows we will present a short abstract regarding the introduction to responsible robotics as well as an overview of each of the differing panels.

SHANNON VALLOR

Name Shannon Vallor, William J. Rewak, S.J. Professor

Affiliation Department of Philosophy, Santa Clara University, USA

Title **Responsible Robotics and Moral Philosophy**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 13:00-13:20; Auditorium C

Abstract

The notion of robotics as a practice that can be 'responsible' implies a normative component, that is, a set of commitments about how robotics research, development and use ought to be carried out. Such normative commitments can be grounded in legal or ethical frameworks, but both kinds of frameworks have deep roots in moral philosophy, specifically in theories of what is right and good in human activity.

Yet contemporary moral philosophers only rarely direct their efforts outside of the arena of academic philosophy in ways that require them to work closely with members of other disciplines and professional practices. In those few domains where they do so, such as applied bioethics, moral philosophers have tended to engage with members of uniquely receptive professions such as medicine and law that have their own long histories of internal normative commitments to responsible practice (for example, the Hippocratic Oath, state and professional licensing standards, and so forth). How, then, can we envision a fruitful working relationship between the practices of moral philosophy and robotics, where this common ground of internal normative commitments is not yet present, and is precisely what we hope to establish?

In my remarks I will reflect upon the unique challenges this presents to the cultures of moral philosophy and robotics alike, and examine several different models for mutually enriching interaction between and/or effective integration of these practices. I will conclude by explaining why a successful response to this challenge would not only facilitate the proximal goal of responsible robotics, but would also help to break open the culture of insularity that continues to hinder moral philosophy.

About the speaker

Shannon Vallor is the William J. Rewak, S.J. Professor in the Department of Philosophy at Santa Clara University, where her research and teaching focuses on the ethical implications of emerging science and technology, including AI, robotics and new media. Professor Vallor received the 2015 World Technology Award in Ethics from the World Technology Network. She is President of the international Society for Philosophy and Technology, and serves on the Executive Board of the Foundation for Responsible Robotics. She is the author of *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting* (Oxford University Press, 2016).

ARTO LAITINEN, RAUL HAKLI AND PEKKA MÄKELÄ

Name

Arto Laitinen, Professor;
Raul Hakli, Postdoctoral researcher;
Pekka Mäkelä, Coordinator.

Affiliation

School of Social Sciences and Humanities, University of Tampere, Finland

Title

Robotics and Philosophical Questions of Responsibility

Session

Workshop 6: Responsible Robotics

Time and location

Friday, October 21, 13:20-13:40; Auditorium C

Abstract

We present an overview of various philosophical questions related to responsibility and robotics. The first question we address is: What is responsibility? In so doing we also address the following related questions: What are its most important sub-classes and why do standard requirements of responsibility suggest that robots are not parties fit to be held responsible? The second question we will address concerns what to think about 'responsibility gaps'. It seems apparent that with technological progress, and various other areas of social life, we face phenomena that no-one seems to be responsible for. What will such gaps look like in the realm of service and social robots and how can we begin to address the bridging of such gaps? Finally, the third question we wish to address focuses on responsibility as applied to robotics. In particular, we want to discuss responsible ways to deal with robots, e.g. what kinds of tasks should we let robots do, what kinds of roles should we delegate to robots? How do we impose limits on designers without stifling innovation?

About the speaker

Arto Laitinen is Professor in Social Philosophy at University of Tampere, co-editor of the *Journal of Social Ontology*, and vice director of the multidisciplinary project *Robots and the Future of Welfare Services* (ROSE) funded by the Strategic Research Council (SRC) of the Academy of Finland. Raul Hakli is Postdoctoral Researcher and Pekka Mäkelä is Coordinator at the Academy of Finland Centre of Excellence for the Philosophy of the Social Sciences (TINT) at the Department of Political and Economic Studies, University of Helsinki, Finland. The authors' interests include collective intentionality, social ontology, collective responsibility, and philosophy of social robotics.

PETER ASARO

Name Peter Asaro, Assistant Professor

Affiliation School of Media Studies, The New School, New York, USA

Title **Responsibility and Liability in Increasingly Autonomous Agents**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 13:40-14:00; Auditorium C

Abstract

In this presentation I will discuss how our notions of moral responsibility are tied up in concepts of moral agency, while legal concepts of agency and liability are more abstract and flexible. This explains, in part, why it is so difficult to wrap our heads around moral responsibility in autonomous artificial agents.

About the speaker

Dr. Asaro is Assistant Professor in the School of Media Studies at the New School in New York City, and Affiliate Scholar in Stanford Law School's Center for Internet and Society, and a member of the University of Twente's 4TU Centre for Ethics and Technology. He is the co-founder of the International Committee for Robot Arms Control, and has written on lethal robotics from the perspective of just war theory and human rights.
Dr. Asaro's research also examines agency and autonomy, liability and punishment, and privacy and surveillance as it applies to consumer robots, industrial automation, smart buildings, aerial drones and autonomous vehicles.

JOHN P. SULLINS

Name John P. Sullins, Professor

Affiliation Department of Philosophy, Sonoma State University, US

Title **Multilevel and Hidden Responsibility in Autonomous Systems**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 14:00-14:20; Auditorium C

Abstract

Robotics complicates responsibility due to the multiple layers of agency, and artificial agency, that operate in any robotics system. We have to design new ethical codes that can help us make sensible policies in a world that includes ubiquitous artificial agents.

About the speaker

John P. Sullins is a professor of philosophy at Sonoma State University in California where he has taught since 2004. He is the 2011 recipient of the Herbert Simon Excellence in Research award from the International Association of Computers and Philosophy and he regularly publishes on the topics of the philosophical implications of military and personal robotics technologies.
Website: sonoma.academia.edu/JohnSullins

MICHAEL NAGENBORG

Name Michael Nagenborg, Assistant Professor

Affiliation Department of Philosophy, University of Twente, the Netherlands

Title **Urban Robotics and Responsible Urban Innovation**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 15:00-15:20; Auditorium C

Abstract

As robots are leaving the factories, they not only start to interact with human and non-human beings on a more casual base. They also start to co-shape the urban environment. This might be most obvious in the case of 'Smart transportation systems'. Self-driving cars, for example, might require specific infrastructures for navigating densely populated spaces. This might result in the implementation of new information infrastructures, which assist the vehicles in sensing the environment (e.g. traffic lights, which communicate with the vehicles). But this might also result in the zoning of public spaces (e.g., dedicated lanes for self-driving cars or service-robots). But self-driving vehicles of different kinds are not the only example for robots co-shaping the city. Robotic systems may also be used for construction and maintenance work. We already see the emergence of 3d printed constructions enabled by robots. The vision of the 'self-maintaining city' also builds on robotic applications. The potential use of robots in smart cities is another currently under researched topic. The potential use of UAVs for policing and by first responders are the best know examples. Yet, this might very well only be the first step.
All of these developments lead to the question; do we want cities to be designed for robots or, do we want robots to be designed for cities. In my talk I will argue for the later.

About the speaker

Michael Nagenborg is an assistant professor for Philosophy of Technology (tenure-tracked) at the Department of Philosophy at the University of Twente. He holds a doctoral degree in philosophy (University Karlsruhe, Germany). His doctoral thesis has been on Privacy and ICT. From 2007 to 2013 he has been a member of the Research Centre for Security Ethics at the International Centre for Ethics in the Sciences and Humanities (University of Tübingen, Germany). In 2014 he became the Managing Director of the 3TU.Centre for Ethics and Technologies. His current research lies at the intersection of philosophical Anthropology and Philosophy of Technology. He is especially interested in the interplay of technology, culture, and the meaning of being human in the context of the city.

ASTRID GYNNILD AND DEBORAH JOHNSON

Names

Astrid Gynnild, Professor (1)
Deborah Johnson, Professor (2)

Affiliation

(1) Department of Information and Media Studies, University of Bergen, Norway
(2) Department of Science, Technology, and Society in the School of Engineering and Applied Science, University of Virginia

Title

Responsible Flying Camera Robots and the Media

Session

Workshop 6: Responsible Robotics

Time and location

Friday, October 21, 15:20-15:40; Auditorium C

Abstract

Responsible use of drones in the media involves considering the implications of using drones one way or another rather than simply letting them go wherever and do whatever is possible. This requires careful monitoring of early use of the technology and feedback to the communities involved. This presentation is part of a larger project aimed at doing just that, i.e., undertaking research on the early uses of drones in the media and involving those who use the technology. The project consists of an international team of scholars centered at the University of Bergen, Norway with funding from the Norwegian Research Council. The project is entitled "Responsible Adoption of Visual Surveillance Technologies in the News Media (ViSmedia)".

About the speaker

Astrid Gynnild is professor of media studies at the Department of Information and Media Studies at the University of Bergen Norway. Gynnild is principal investigator of the trans-disciplinary research project ViSmedia (Responsible Adoption of Visual Surveillance Technologies in the News Media) 2015–19. Gynnild also heads the journalism program at the University of Bergen, which in 2017 will be integrated into Media City Bergen. Her research interests lie at the intersection of digital journalism, innovation and new technologies. She is also engaged in developing new forms of learning in profession oriented disciplines in higher education.

Deborah G. Johnson is the Anne Shirley Carter Olsson Professor of Applied Ethics and Chair of the Department of Science, Technology, and Society in the School of Engineering and Applied Sciences of the University of Virginia. Johnson received the John Barwise prize from the American Philosophical Association in 2004; the ACM SIGCAS Making a Difference Award in 2000; and the Sterling Olmsted Award from the Liberal Education Division of the American Society for Engineering Education. Johnson has published over 50 papers in a variety of journals and edited volumes.

PETER NOVITZKY

Name Peter Novitzky, Postdoc researcher

Affiliation Department of Philosophy, Dublin City University, Ireland

Title **Present and Future Impact of Drones -- Too Late to Address Ethical Concerns?**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 15:40-16:00; Auditorium C

Abstract The application of drones in civil, industrial, scientific, and military areas traditionally raises ethical-concerns regarding privacy, surveillance, and safety. Other ethical challenges and opportunities of drone technology are less explored. This presentation will explore the less prevalent ethical challenges andopportunities of drones. It will also suggest propositions regarding the responsible and ethical development and application of drones, which will include systematic harmonisation of the terminology, consideration of key elements that should be incorporated in the normative ethical analysis of drone technology, and discussion around how preferred values may be incorporated into the design of drones during their research and development.

About the speaker Peter joined the Department of Philosophy of UT as a postdoc researcher working on the NWO Project on Responsible Design of Drones and Drone Services: Towards an Ethical and Juridical Tool for Drone Design and Risk Assessment. Peter successfully completed his PhD in Applied Philosophy at Dublin City University (Ireland) with his thesis on the ethics of Ambient Assisted Living (AAL) technologies for persons with dementia. Peter holds an Erasmus Mundus Master of Bioethics from the consortium of Katholieke Universiteit Leuven (Belgium) – Radboud Universiteit Nijmegen (Netherlands) – Università degli Studi di Padova (Italy), following previous studies in Theology and Philosophy, in Budapest (Pazmany Peter Catholic University) and Prague (Charles University). He specialises in Bioethics and Ethics of Technology.

ALAN WINFIELD

Names Alan Winfield, Professor

Affiliation Department of Engineering, Design and Mathematics, University of the West of England, UK

Title **Ethical Governance is Needed to Build Trust**

Session Workshop 6: Responsible Robotics

Time and location Friday, October 21, 16:00-16:20; Auditorium C

Abstract

In general technology is trusted if it brings benefits while also being safe, well regulated and, when accidents happen, subject to robust investigation. One of the reasons we trust airliners is that we know they are part of a highly regulated industry with an excellent safety record. The reason commercial aircraft are so safe is not just good design, it is also the tough safety certification processes and, when things do go wrong, robust processes of air accident investigation. Should driverless cars, for instance, be regulated through a body similar to the Civil Aviation Authority (CAA), with a driverless car equivalent of the Air Accident Investigation Branch?
Regulation requires regulatory bodies, linked with public engagement to provide transparency and confidence in the robustness of regulatory processes. All of which supports the process of building public trust, as shown in the figure below.
In this workshop contribution I will make the argument that responsible robotics needs ethical governance, and – based on the framework above – outline the component parts of governance in robotics.

About the speaker

In 1984, shortly after completing a PhD in Digital Communications Winfield resigned his lectureship at the University of Hull, to found a company on the then newly established Hull University Science Park. Winfield went on to establish the company, APD Communications Ltd, as one of the key UK providers of software for mobile radio data systems, notably leading contracts to design a fault-tolerant radio communications infrastructure for the Channel Tunnel. Moving into the field of mobile robotics he co-founded, with Chris Melhuish and Owen Holland, the Intelligent Autonomous Systems (IAS) Laboratory at the University of the West of England in 1993, re-launched in 2005 as the joint UWE, University of Bristol Bristol Robotics Laboratory. Within the BRL Winfield's projects span Swarm Intelligence. His work on Swarm Robotics is concerned with algorithms, analysis, modelling and specification for potential high integrity applications. More recent work has been directed toward both social intelligence and evolutionary robotics, with a particular focus on robots with simulation-based internal models.

RESTAURANT GUIDE

Restaurants and cafés

We recommend the following restaurants and cafés in Aarhus, using the following categories:
L=Lower priced
M=Medium priced
U = Upper priced

Aarhus Street Food (L)
Large hall with different street food trucks, dining at refectory tables
Ny Banegårdsgade 46
8000 Aarhus C
Web: www.aarhusstreetfood.com

Café Lecoq (M)
French Bar, Restaurant & Brasserie
Graven 16
8000 Aarhus C
Phone: +45 86 19 50 74
Web: www.cafe-lecoq.dk

Cafe Smagløs (L)
An old cafe/bar with good food and music
Klostertorvet 7
8000 Aarhus C
Phone: +45 86 13 51 33
Web: www.smagloes.dk

CANblau Aarhus (M)
Traditional spanish tapas
Klostertorvet 9
DK-8000 Aarhus C
Phone: +45 86 88 88 19
Web: www.canblau.dk/

Den Rustikke (L)
French and friendly
Mejlgade 20
8000 Aarhus C
Phone: +45 86 12 00 95
Web: www.denrustikke.dk

Frederiksgade 42 (M-U)
Has a concept of sharing food, 80% vegetables/20% meat
Frederiksgade 42
8000 Aarhus C
+45 60 68 96 06
Web: spisestedet@frederiksgade42.dk

Kähler Spisesalon (U)
Danish design and nordic gastronomy. And 'Smørrebrød' to go.
M.P. Bruuns Gade 33
8000 Aarhus C
Tlf: 86 12 20 53
Web: www.spisesalon.dk

Nordisk Spisehus (M-U)
City gourmet inspired by international Michelin restaurants
M.P. Bruuns Gade 31
8000 Aarhus C
Tlf. 86 17 70 99
Web: www.nordiskspisehus.dk

Restaurant Le Basilic (L-M)
Danish-French fusion. Bring your own wine.
Mejlgade 85
8000 Aarhus C
Phone: +45 86 18 24 41
Web: www.basilicaarhus.dk

Restaurant Det Glade Vanvid (M-U)
All inclusive, wine ad libitum danish gourmet
Pakkerivej 2b
8000 Aarhus C
Phone: +45 87 42 0123
Web: www.kocherier.dk/RESTAURANT-DET-GLADE-VANVID.62.aspx

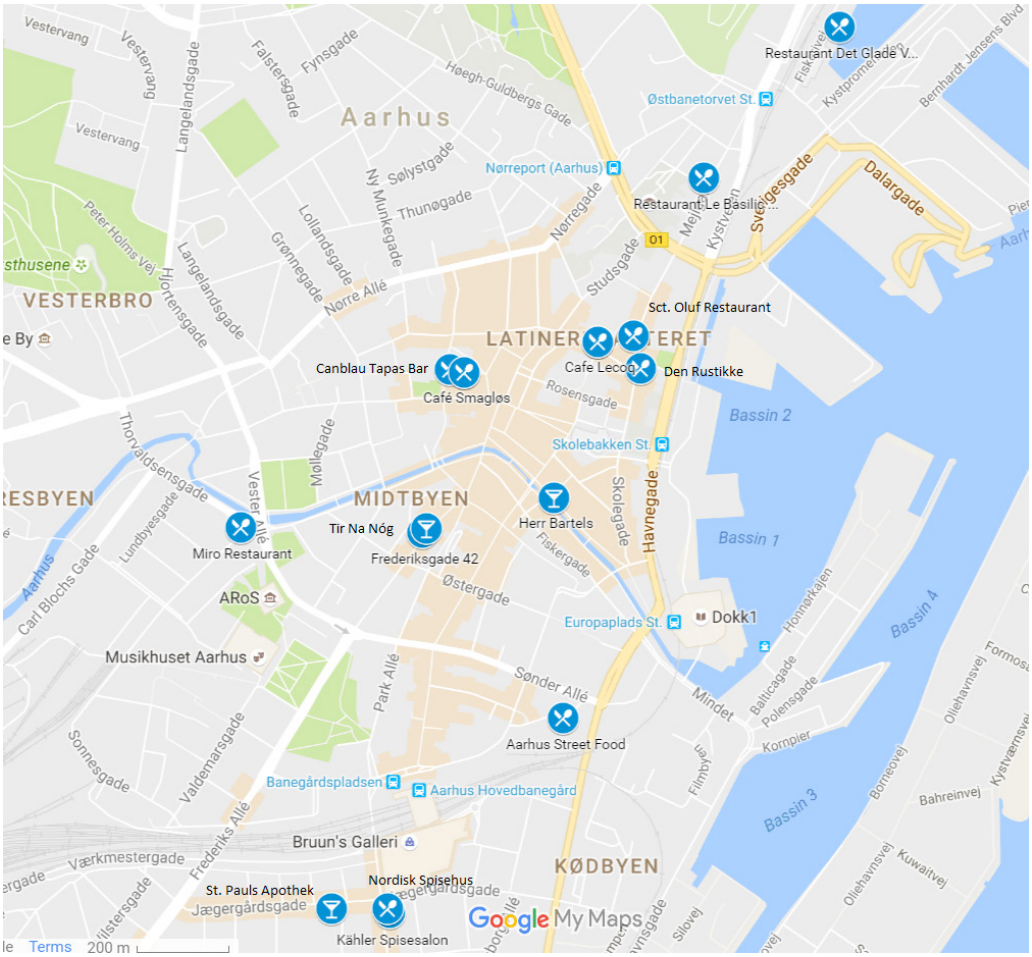
Sct. Oluf Restaurant (L-M)
French atmosphere and danish cosyness
Mejlgade 33
8000 Aarhus
Phone: +45 86 12 75 54
Web: www.facebook.com/pages/Sct-Oluf-Restaurant-og-Bar-ApS

Bars

Tir Na Nóg
Irish pub with sports, quizzes and live music
Frederiksgade 40
8000 Aarhus
Phone: +45 86 19 19 10
Web: www.tirnanog.dk

Herr Bartels
Cocktails in laid back bar
Åboulevarden 46
8000 Aarhus C
Phone: +45 86 18 08 33
Web: www.herrbartels.dk

St. Pauls Apotek
Cool bar, well known for their cocktails
Jægergårdsgade 23
8000 Aarhus C
Phone: +45 86 12 08 33
Web: www.stpaulsapothek.dk



CONFERENCE RELATED EVENTS

"Children's Imagined Robots" exhibition
Located in the conference foyer in Tåsingegade 3, building 1441.
The exhibition is open Monday, October 17 to Friday, October 21, from 8.30 – 19.00

The *Children's Imagined Robots* exhibition features over one hundred drawings of robots designed by children in Denmark, Germany, Russia, Tanzania and the United States. The exhibit presents a unique perspective on alternate futures imagined by children in different cultures. As you view these designs, consider that the artists who created them may be the first to live in a world with social robots yet their views are rarely considered early in the design process.
Thanks to a growing, international network of researchers and collaborators who worked on this show, attendees of RoboPhilosophy 2016 will be the first to see the exhibit featuring designs from five countries. Prior iterations of the exhibition featuring designs from just Russian and US children have been shown at the Powerhouse Museum of Art & Design (Sydney, Australia), The Peabody Essex Museum and at the Harvard Graduate School of Education (US).
The related *Co-designing child-robot-interactions workshop* will explore approaches for designing robots with children that incorporate the needs and preferences of children. Participants will discuss, listen to invited speakers and engage in a group, robotehtics imaginative exercise using the ideas presented in the exhibition as a point of departure.

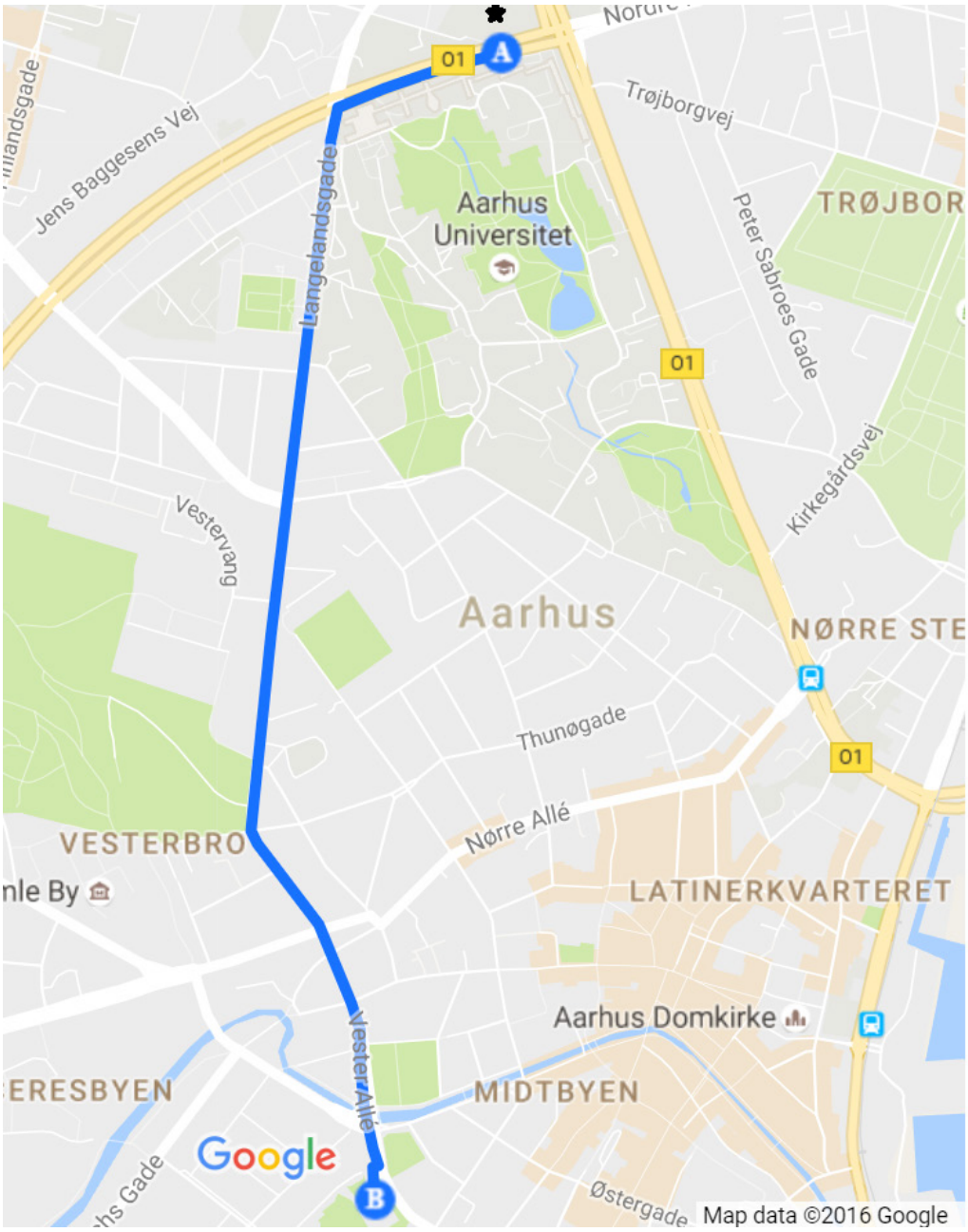
"Solaris Korrigert" performance by Grethe Mo
The performance will take place in relation to the Conference Dinner at ARoS Museum Restaurant.
Wednesday, October 19 at 21.00 at ARoS Museum Restaurant.

The actress Grethe Mo will perform an extract from her staging of Øyvind Rimbereids highly acclaimed poem called Solaris Korrigert.
Canonized in the Norwegian literary canon, Øyvind Rimbereids poem is ranking among the 25 best literary works in Norwegian literature. The lyrical "I" is living on the west coast of Norway in the year of 2480. She is the manager of a group of robots maintaining pipes at the bottom of the sea. Unlike the classical sci-fi hero this robot operator, loves her robots, and has "simpl, silly draumar" for her life. She invites you into her future where she lives in a sort of cooperative organization called 14.6, the final stage before the evacuation to the empty oil wells underneath the North Sea. There she will live in a new "mirror-world", a safe world, called "Safea-botten".
The poem itself is written in a constructed hybrid mix of west-Norwegian dialect, Old Norwegian, English, Scottish, Danish and German; nearly all the countries surrounding the North Sea. Experiencing the performance of Solaris Korrigert might make you feel as if you get a shrilling phone call from the future.

Following is an excerpt of the poem Solaris Korrigert:

WAT vul aig bli / Om du ku kreip fra/ din vorld til uss?/ SKEIMFULL, aig trur, ven/ du kommen vid / diner imago/ ovfr oren tiim, tecn, airlife,/ all diner apocalypsen
skreik-mare. Or din beauti dram!/ (...) /Kommen du vid meg?

MAP FOR WALK TO CONFERENCE DINNER AT AROS



PRACTICAL INFORMATION

Banks and currency Exchange
Opening hours:
Monday-Friday: 10.00–16.00
Thursday: 10.00–17.30
Closed Saturdays and Sundays

Currency exchange at Forex
The exchange rates are better and you do not pay a fee when buying foreign currency at Forex.
Address: Forex, Banegårdspladsen 20, (+45) 86 80 03 40.

Credit card/cash points
Cash points accepting major credit cards are located all over the city; the closest cash point on campus is five minutes from the conference information desk in building 1422 at the entrance to the cafeteria 'Stakladen Kantine' (Fredrik Nielsensvej 2).

Conference and registration desk
The conference desk located in the foyer of building 1441 (campus of Aarhus University, Tåsinge-gade 3, 8000 Aarhus C) is open for on-site registration and information:

Monday, October 17: from 11:00–19:00

Tuesday to Friday, October 18 to 21: from 8:30–19:00

For any emergencies write to infodesk.robophilosophy@gmail.com to contact the conference desk, between October 17 and 21, from 8:00 to 20:00.

Emergency phone numbers
(+45 only when calling from outside Denmark)

Police, fire, ambulance (+45) 112
Falck rescue services (+45) 70 10 20 30
Police (+45) 87 31 14 48
Doctor, both normal and outside working hours – call here before going to the Emergency Room (+45) 70 11 31 31
Pharmacy, outside normal hours (+45) 80 20 24 07

Dining out in Aarhus
Most restaurants in Aarhus are open from 11:30–24:00. However, hot meals are not served after 22:00. Service charges are included in the price. See our restaurant guide below.

Insurance and liability
Participants are advised to take out their own health and travel insurance.

Postal service
The nearest post office is a 20-minute walk from the venue (located at Storcenter Nord, Finlands-gade 17, DK-8200 Aarhus N). Please contact the information desk for directions.

Opening hours:
Monday – Friday: 10.00-18.00
Saturday: 10.00-14.00
Sunday: closed

Car parking
Free car parking is available outside the conference venue (Aarhus University). Downtown parking is generally metered.

Car rental
Cars can be rented from local or international companies such as Budget, Avis, Hertz and Europcar. Your hotel receptionist will assist you if you wish to rent a car.

Shopping
Shops in Aarhus are usually open from Monday to Friday, from 10.00–17.30 (Saturdays 10.00-14.00). Most supermarkets and department stores are open until 20.00–21:00 on weekdays and are normally closed on Sundays. Most shops accept all major credit cards.

Smoking
Smoking is forbidden indoors in public places, public buildings, and private businesses – including restaurants, pubs, shops, public transportation, entertainment venues and workplaces – throughout the country. The only exception from the ban is for establishments with an area less than 40 sq.mtrs., which don't serve fresh food – so you can still enjoy a cigarette in some smaller pubs if you're lucky – some places have installed special smoking rooms but most refer smokers to the streets.

Taxes
The current Value Added Tax (VAT) rate is 25 %. VAT is included in hotel and restaurant bills, entrance fees, ect. and cannot be refunded on these services. Tax-free shopping is possible in many major shops and department stores for visitors from non-EU and non-Scandinavian countries. The VAT is refunded at the airport upon presenting a completed VAT refund form. To achieve the VAT refund, a minimum purchase of DKK 300 per shop is required.

Taxis
Call: 89 48 48 48 or 70 25 25 25. (The country code is +45)

While taxis are available, Aarhus also has good public transportation; see www.midttrafik.dk/in-english.aspx for general information and www.rejseplanen.dk/bin/query.exe/en for a journey planner.

Time zone
Denmark follows Central European Time (CET) which is one hour ahead of Greenwich Mean Time (GMT) and six hours ahead of Eastern Standard Time (EST)

Tipping
Gratuities are automatically included in the bills for service, meals etc. Tipping is optional.

Voltage
Electricity in Denmark is 220V AC. Plugs are European standard with two round pins.

COLOPHON

Main organizers
Johanna Seibt, Marco Nørskov

Co-organizers
Kerstin Fischer, Cathrine Hasse, Gunhild Borggreen

Program committee
Gunhild Borgreen, Charles Ess, Kerstin Fischer, Cathrine Hasse, Raul Hakli, Marco Nørskov, Raffaele Rodogno, Johanna Seibt

Conference Consultant
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On-site Manager and Head of Conference Staff
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TRANSOR

An International Cross-Cultural Network for Transdisciplinary Research in Social Robotics

The Research Network for Transdisciplinary Studies in Social Robotics - TRANSOR - is an international initiative for research exchange and research collaboration. The network aims to integrate Humanities research into Human-Robot Interaction Studies (HRI) and to facilitate collaborations between researchers from robotics with researchers in anthropology, philosophy, linguistics, sociology, art, psychology, cognitive science, education science, communication and media science, law, and economy.

Since the pervasive use of social robots will change our socio-cultural practices, we need to explore the transformative potential of this new technology with the methods and categories of all fields that pertain to human social interaction. The events of the network present empirical, experimental, conceptual and phenomenological research, and take cross-cultural variations into account. Even though currently TRANSOR events are still interdisciplinary, the network's long-term aim is to facilitate a vision of social robotics as a transdisciplinary research area of cultural engineering.

Currently the network has about 90 members; membership is free and all researchers with interest in the area of social robotics are invited to join. For further information see **www.transor.org**.

AARHUS
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The "robotic moment" (Turkle 2011) is no longer on the horizon—we are living it now. Given the rapid development in social robotics, we are now at that potential turning point in human cultural history during which we need to react to concrete visions, by the robotics research industry, of placing artificial 'social' agents ubiquitously into the public and private spaces of human social interactions.

How shall we respond? And who is to respond?
If we are changing the 'human condition' at its foundations, can humanity rise to the occasion?