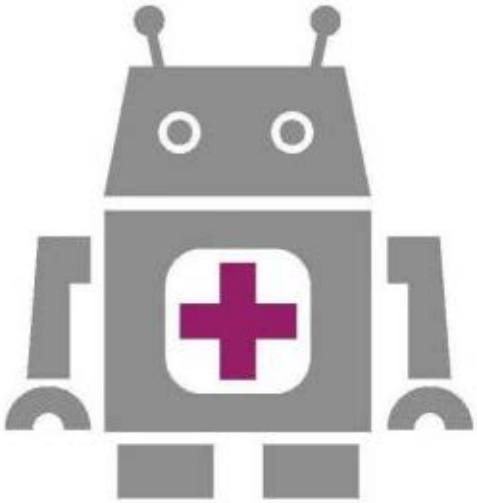
COST Workshop on Social Robotics

The future concept and reality of Social Robotics: challenges, perception and applications

The role of Social Robotics in current and future society



Challenges

Working Group Booklet

Tuesday 11 - Thursday 13 June 2013
International Press Centre (IPC), Résidence Palace
Brussels, Belgium

http://www.cost.eu/events/socialrobotics
#socialrobots

COST is supported by the EU Framework Programme

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Programme

Monday 10 June 2013

Hotel NH Du Grand Sablon, Rue Bodenbroek 2/4, 1000 Brussels (BE)

17.30 – 19.00: Workshop Registration

19.00 – 19.30: Welcome words by **COST representatives**

19.30 – 20.00: **Gian Piero Brunetta** (University of Padua, IT) “Robots in the cinema”

20.00 – 22.00: Dinner

Tuesday 11 June 2013

International Press Centre, Rue de la Loi 155, 1000 Brussels (BE)

8.30 Workshop Registration

9.00 – 13.00: Plenary Session (Polak Room) - Chair: Leopoldina Fortunati (University of Udine, IT)

9.00 – 9.15: Official Opening by **Tatiana Kovacikova**, COST Office Head of Science Operations

9.15 – 9.30: Workshop Introduction by **Leopoldina Fortunati**, Head of the Organising Committee

9.30 – 10.00: **Anne Bajart** (EC/DG Connect A2 Robotics) “The EU-funded research programme in robotics: achievements and perspectives”

10.00 – 10.30: **Fabrizio Sestini** (EC/DG Connect) “Collective Intelligence, Internet Ethics and Sustainability: Issues for Social Robots”

10.30 – 11.00: **Sakari Taipale** (University of Jyväskylä, FI) “European perceptions of robots and related implications for the policies of the social”

11.00 – 11.30: Coffee break

11.30 – 12.00: **Atsuo Takanishi** (Waseda University, JP) “Some Aspects of Humanoid Robot Design”

12.00 – 12.30: **Antonio Bicchi** (University of Pisa, IT) “From Social Robots to Societies of Robots”

12.30 – 13.00: **Naomi Baron** (American University Washington D.C., US) “Shall We Talk? Conversing with Humans and Robots”

13.00 – 14.00: Lunch break

14.00 – 16.00: Working Group Session I

Working Group “Challenges” (Maelbeek Room)

Chair: James E. Katz (Boston University, US)

14.00 – 14.20: **James Katz** (Boston University, US) “Attitudes toward robots suitability for various jobs as affected robot appearance”

14.20 – 14.40: **Matthias Rehm** (Aalborg University, DK) “Culture Aware Robotics”

14.40 – 15.00: **Shuzhi Sam Ge** (National University of Singapore, SG) “Era of Social Robots”

15.00 – 15.20: **Christine Linke** (University of Berlin, DE) “Phenomena of Human-Social Robot-Interaction: The Social Construction of Reciprocity, (Inter-)Subjectivity and Relationship”

15.20 – 16.00: Panel Discussion

Working Group “Perception” (Passage Room)

Chair: Ryad Chellali (Italian Institute of Technology, IT)

14.00 – 14.20: **Maria Bakardjieva** (University of Calgary, CA) “This Bot Hurt my Feelings: Ethics and Politics for Social Bots”
14.20 – 14.40: **Nikhil Bhattacharya** (Institute for Liberal Arts, US) “With Our Technology, In Our Image: A Philosophical Analysis of Social Robots”
14.40 – 15.00: **Charles Ess** (University of Oslo, NO) “Robots and Humans as Virtuous Agents? Core questions and challenges”
15.00 – 15.20: **Michaela Pfadenhauer** (Karlsruhe Institute of Technology, DE) “The Contemporary Appeal of Artificial Companions”
15.20 – 16.00: Panel Discussion

Working Group “Applications” (Polak Room)

Chair: Alessandro Saffiotti (Orebro University, SE)

14.00 – 14.20: **Rytis Maskeliunas** (Kaunas University of Technology, LT) “Gaze tracking based emotional status determination”
14.20 – 14.40: **Timo Kaerlein** (Universität Paderborn, DE) “The robotic moment in mobile media. An inquiry into new intimacies in human-technology relationships”
14.40 – 15.00: **Pelachaud Catherine** (CNRS, FR) “Socio-emotional humanoid agent”
15.00 – 15.20: **Barbara Lewandowska Tomaszczyk and Paul A. Wilson** (University of Lodz, PL) “Affective robotics - modelling and testing cultural prototypes “
15.20 – 16.00: Panel Discussion

16.00 – 16.30: Coffee break

16.30 – 18.30: Working Group Session II

Working Group “Challenges” (Maelbeek Room)

Chair: James E. Katz (Boston University, US)

16.30 – 16.50: **Amparo Lásen** (University Complutense of Madrid, ES) “The Shared Agency between People and Technologies in the Context of the ‘Affective Paradox’ ”
16.50 – 17.10: **Maria Teresa Riviello** (Second University of Naples and IIASS, IT) “A Cross-Cultural Study on the Effectiveness of Visual and Vocal Channels in Transmitting Dynamic Emotional Information”
17.10 – 17.30: **Juha Röning** (University of Oulu, FI) “Natural Human Robot Interaction”
17.30 – 17.50: **Stefan Benus** (Constantine The Philosopher University, SK) “Social aspects of entrainment in spoken interactions”
17.50 – 18.30: Panel Discussion

Working Group “Perception” (Passage Room)

Chair: Ryad Chellali (Italian Institute of Technology, IT)

16.30 – 16.50: **Sara Rosenblum** (University of Haifa, IL) “Brain-hand language secrets as reflected through a computerized system”
16.50 – 17.10: **Kimmo Vanni** (Tampere University of Applied Sciences, FI) “Social robotics as a tool for promoting occupational health”
17.10 – 17.30: **Shirley Elprama and An Jacobs** (Vrije Universiteit Brussel, BE) “Robots in the operating room”
17.30 – 17.50: **Elizabeth Broadbent** (The University of Auckland, NZ) “The social and emotional impact of robots in healthcare”
17.50 – 18.30: Panel Discussion

Working Group “Applications” (Polak Room)

Chair: Alessandro Saffiotti (Orebro University, SE)

16.30 – 16.50: **Patrick Law** (The Hong Kong Polytechnic University, HK) “Biomedical Engineering: The case of rehabilitation program in Hong Kong”

16.50 – 17.10: **Rui Loureiro** (Middlesex University, UK) “Social robots in the rehabilitation of cognitive and motor function”
17.10 – 17.30: **Anthony Remazeilles** (Tecnalia Research and Innovation, ES) “Development of mobile robots for providing assistance to the elderly population: experience acquired”
17.30 – 17.50: **Filippo Cavallo** (Scuola Superiore Sant'Anna, IT) “Social Robotics for healthcare applications: the Robot-Era experience”
17.50 – 18.10: **Renaud Ronsse** (Université Catholique de Louvain, BE) “Primitive-based entrainment in upper- and lower-limb periodic movement assistance by using adaptive oscillators”
18.10 – 18.30: Panel Discussion

Wednesday 12 June 2013

International Press Centre, Rue de la Loi 155, 1000 Brussels (BE)

8.30 – 9.00: Workshop Registration

9.00 – 11.00: Plenary Session (Polak Room) - Chair: Anna Esposito (Second University of Naples and IIASS, IT)

9.00 – 9.30: **Satomi Sugiyama** (Franklin College Switzerland, CH) **and Jane Vincent** (University of Surrey, UK) “Consideration of the mobile device as a form of social robot”
9.30 – 10.00: **Kerstin Dautenhahn** (University of Hertfordshire, UK) “Social robotics and real world applications – an interdisciplinary perspective”
10.00 – 10.30: **Anniina Huttunen** (University of Helsinki, FI) “Does Intelligence Matter? - Legal Ramifications of Intelligent Systems”
10.30 – 11.00: **David Cohen and Mohamed Chetouani** (University Pierre and Marie Curie, FR) “Social Signal Processing in Developmental Psycho-Pathology”

11.00 – 11.30: Coffee break

11.30 – 13.30: Working Group Session III

Working Group “Challenges” (Maelbeek Room)

Chair: Harmeet Sawhney (Indiana University, US)

11.30 – 11.50: **Carlo Nati** (Education 2.0, IT) “Cad software to introduce robotic design process at school”
11.50 – 12.10: **Chung Tai Cheng** (The Hong Kong Polytechnic University, HK) “The technologicalization of education in China and the case study of Home-School Communication System”
12.10 – 12.30: **Michele Viel and Giovanni Ferrin** (University of Udine, IT) “Taming social robots through playfulness and do it yourself: children in action”
12.30 – 12.50: **Linda Giannini** (MIUR, IT) “Pinocchio 2.0, robot and other stories”
12.50 – 13.30: Panel Discussion

Working Group “Perception” (Passage Room)

Chair: Guglielmo Tamburrini (University of Naples “Federico II”, IT)

11.30 – 11.50: **Nadia Berthouze** (University College London, UK) “Body Movement and touch behaviour as means to recognize and enhance affective experience”
11.50 – 12.10: **Marcin Skowron** (Austrian Research Institute for Artificial Intelligence, AT) “From Virtual to Robot Bartender: insights from the affective dialogue system”
12.10 – 12.30: **Anna Esposito** (Second University of Naples and IIASS, IT) “Emotional expressions: Communicative displays or psychological universals?”

12.30 – 12.50: **Kristrún Gunnarsdóttir** (Lancaster University, UK) “Robot assistance: prominent visions and problem domains”
12.50 – 13.30: Panel Discussion

Working Group “Applications” (Polak Room)

Chair: Sara Rosenblum (University of Haifa, IL)

11.30 – 11.50: **Hicham Atassi** (Brno University of Technology, CZ) “An Autonomous intelligent system for Call Centres Surveillance and Assessment”
11.50 – 12.10: **Tatsuya Matsui** (Flower Robotics Inc., JP) “A design approach for the robots to be accepted in the society”
12.10 – 12.30: **Claudia Pagliari** (University of Edinburgh, UK) “Roles, relationships and rights in interactions between real and virtual humans: insights and implications from a study on Avatar-supported eHealth”
12.30 – 12.50: **Vanessa Evers** (University of Twente, NL) “Human Robot Co-existence”
12.50 – 13.30: Panel Discussion

13.30 – 14.30: Lunch break

14.30 – 16.30: Working Group Session IV

Working Group “Challenges” (Maelbeek Room)

Chair: Harmeet Sawhney (Indiana University, US)

14.30 – 14.50: **Ryad Chellali** (Italian Institute of Technology, IT) “The Social Robot: myths, reality and perspectives”
14.50 – 15.10: **Raul Pertierra** (Manila University, PH) " The person in the machine: the machine in the person”
15.10 – 15.30: **Joachim Hoeflich and Afifa El Bayed** (University of Erfurt, DE) “The Acceptance of Social Robots in Today’s Germany and its Prospects”
15.30 – 15.50: **Nello Barile** (Iulm, University of Milan, IT) “The automation of taste: anthropological effects of Shazam and another apps used as search engines in the everyday life”
15.50 – 16.30: Panel Discussion

Working Group “Perception” (Passage Room)

Chair: Guglielmo Tamburrini (University of Naples “Federico II”, IT)

14.30 – 14.50: **Davide Fornari** (Supsi University of Applied Sciences and Arts of Southern Switzerland, CH) “Face as interface: anthropomorphic and zoomorphic artefacts”
14.50 – 15.10: **Takaaki Kuratate** (Technical University of Munich, DE) “Mask-bot: a retro-projected talking head for social interaction media applications”
15.10 – 15.30: **Carl Vogel** (Trinity College Dublin, IE) “Intending no offence”
15.30 – 15.50: **Etienne Burdet** (Imperial College London, UK) “Adaptive nature of human-human interaction”
15.50 – 16.10: **Peter Sinčák** (Technical University of Kosice, SK)
16.10 – 16.30: Panel Discussion

Working Group “Applications” (Polak Room)

Chair: Sara Rosenblum (Haifa University, IL)

14.30 – 14.50: **Milan Gnjatović** (University of Novi Sad, SR) “The Child, the Therapist, and the Robot: Adaptive Dialogue Management in Three-Party Interaction”
14.50 – 15.10: **Sonya Meyer** (Haifa University, IL) “Social Robots as possible Celiac Disease management mediators for supporting adherence to a healthy lifestyle”
15.10 – 15.30: **Hideki Kozima** (Miyagi University, JP) “Social robot for autism therapy”

15.30 – 15.50: **Frano Petric** (University of Zagreb, HR) “Application of Humanoid Robots in Diagnostics of Autism”

15.50 – 16.30: Panel Discussion

16.30 – 18.00: Social Robots Exhibition (opened by private reception)

Thursday 13 June 2013

International Press Centre, Rue de la Loi 155, 1000 Brussels (BE)

8.30 – 9.00: Workshop Registration

9.00 – 10.30: Plenary Session (Polak Room) - Chair: Thierry Keller (Tecnalia Research & Innovation, ES)

9.00 – 9.30: **Paolo Dario** (Scuola Superiore Sant’Anna, IT) “Robot Companions for Citizens: a Vision to Address Societal Challenges and to Improve Quality of Life”

9.30 – 10.00: **Aude Billard** (École Polytechnique Fédérale de Lausanne, CH) “Issues when transferring knowledge from humans to robots”

10.00 – 10.30: **Alessandro Vinciarelli** (University of Glasgow, UK) “Social Signal Processing”

10.30 – 11.00: Coffee break

11.00 – 13.00: Working Group Session V

Working Group “Challenges” (Maelbeek Room)

Chair: Maria Bakardjieva (University of Calgary, CA)

11.00 – 11.20: **Alessandro Saffiotti** (Orebro University , SE) “Towards a human robots-environment ecosystem: opportunities and challenges”

11.20 – 11.40: **António Brandão Moniz** (Karlsruhe Institute of Technology, DE) “Intuitive interaction between humans and robots in industrial environments: the social robotics role”

11.40 – 12.00: **Maria Koutsombogera** (Institute for Language And Speech Processing, EL) “Developing resources of social interactions”

12.00 – 12.20: **Costanza Navarretta** (University of Copenhagen, DK) “The annotation and use of multimodal corpora for modelling believable social robots”

12.20 – 13.00: Panel Discussion

Working Group “Perception” (Passage Room)

Chair: Valèria Csèpe (Hungarian Academy of Sciences, HU)

11.00 – 11.20 **Valéria Csépe** (Hungarian Academy of Sciences) “Augmented reality and assisted perception”

11.20 – 11.40 **Angelo Cangelosi** (Plymouth University, UK) “Embodied Language Learning in Human-Robot Interaction”

11.40 – 12.00 **Agnieszka Wykowska** (Ludwig Maximilians Universität, DE) "Cognitive- and social neuroscience for social robotics - how the present challenges can tell us where to go in the future”

12.00 – 12.20 **Karola Pitsch** (Bielefeld University, DE) “Social Learning from an Interactional Perspective. The role of a robot's feedback in tutoring situations in human-robot-interaction”

12.20 – 13.00: Panel Discussion

Working Group “Applications” (Polak Room)

Chair: Alicia Casals (Universitat Politècnica de Catalunya, ES)

11.00 – 11.20: **Thierry Keller** (Tecnalia Research & Innovation, ES) “Robotics for Neurorehabilitation: Current challenges and approaches”

11.20 – 11.40: **Alicia Casals** (Universitat Politècnica de Catalunya, ES) “Social Acceptance in robotics for health”

11.40 – 12.00: **Peter Friedland** (Peter Friedland Consulting, US) “Developing Trust in Human-Machine Interaction”

12.00 – 12.20: **Marcos Faundez Zanuy** (Escola Universitaria Politecnica de Mataro, ES) “Xnergic: a Tecnocampus initiative to promote engineering vocations”

12.20 – 13.00: Panel Discussion

13.00 – 14.00: Lunch break

14.00 – 15.30: Summaries by Working Groups’ Chairs - Chair: James Katz (Boston University, US)

15.30 – 16.00: Conclusions and Follow-Up - Chair: Leopoldina Fortunati (University of Udine, IT)

Working Group Speakers

James E. Katz
Working Group Chair
Sessions I and II (11 June)

Organisation Boston University, Division of Emerging Media Studies

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Biography James E. Katz, Ph.D., is the Feld Professor of Emerging Media at Boston University's College of Communication. In addition, he directs its Division of Emerging Media Studies. The Division addresses the process of how new media technologies are created and introduced to users, the effects they have on users, and how technologies and the content they produce are molded, co-constructed and re-constructed by users. Dr. Katz joins BU from Rutgers University where he held the title of Board of Governors Professor of Communication, the highest honor the University can bestow on a member of its faculty. During his time at Rutgers, Katz served two terms as chair of the Department of Communication and also directed the Center for Mobile Communication Studies, which he founded in 2004. Earlier in his career, Dr. Katz headed the social science research unit at Bell Communications Research, which also honored him with the title of Distinguished Member of Staff. Dr. Katz has devoted his career to analyzing the uses and social consequences of emerging communication technologies, especially the Internet and telephone. He explores how they affect social interaction and what their uses reveal about human nature and organizations and was among the first to demonstrate their pro-social uses. He also seeks to understand what the future holds in terms of society and communication technologies and works with others to explore ways in which society can best prepare itself to make the optimal use of new developments.

Abstract **Attitudes toward robots suitability for various jobs as affected robot appearance**

An opinion survey of 878 college students conducted in 2011 examined attitudes about the suitability of robots for various occupations in society and how these attitudes varied by the robots' appearance. Factor analyses revealed three primary attitudes: Robot-Liking, Robotphobia and Cyber-Dystopianism, and three occupational niches: social-companionship, surveillance and personal assistants. Attitudes varied depending on subjects' gender, religion, perceived competence with technologies and engagement with virtual reality environments and avatars. Analysis of relationships between subjects' attitudes and perception of suitable occupations indicated that Robot-Liking is positively related with social-companionship and surveillance occupations, whereas Robotphobia negatively correlated with the three occupational niches.

Matthias Rehm

Organisation Aalborg University

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Biography Matthias Rehm is associated professor for media technology at the Faculty of Engineering and Science at Aalborg University (Denmark) where he works on cultural aspects of HCI, social robotics, and mobile interaction. Prior to that, he has worked at Augsburg University at the lab for multimedia concepts and applications where he has been leading several international projects in the area of multimodal interactive systems. His research interests include human robot interaction, cultural aspects of human computer interaction, modeling of social behavior as well as multimodal user interfaces. He has published over 60 peer-reviewed papers in the area of human-centered computing.

Abstract **Culture Aware Robotics**

Culture is not the first aspect that comes to mind when discussing human robot interaction. But our cultural upbringing does to a large degree influence our patterns of behavior and interpretation. Thus, culture is present in the development of robotic systems right from the start, unconsciously influencing how robots look, what we envision with them to do, and how they are programmed to interact with the user. Culture has recently begun to be addressed in information technology. Culturally-Aware Technology (CAT) refers to systems where culture-related information has had some impact on design, runtime or internal processes, structures, and/or objectives [1]. Most of the research on CAT is grounded on existing cultural frameworks such as Hofstede's system of values [2] or Hall's work on verbal and non-verbal communication [3]. Some also propose a more practical approach focusing on the cultural specifics of communicative situations [4]. Research on CAT is very diverse and addresses issues such as cultural data management [5], enculturated design [6] and interaction [7], culture-based decision making for interaction[8] and intercultural education [9]. In regard to robotics and especially in interaction with social robots, the notion of culture becomes relevant on several levels. The interaction patterns that a user employs may be dependent on cultural heuristics. This can for instance be seen in the area of proxemics, i.e. spatial behavior towards the interaction partner, or in the use and interpretation of non-verbal signals. Another aspect touches the perception and acceptance of robots in a cultural group, e.g. introducing robots in the health sector can be viewed as a suitable way to cope with the imminent challenges in this area or it can be seen as a threat to the patients. One could also argue that robots are representing a different culture altogether such that each human robot interaction is an intercultural encounter in itself. In this presentation, we will take a closer look at culture as a parameter that influences the interaction between the user and a social robot. In order to understand the complexity of the notion of

culture on human behavior and interpretation of behavior, we will review definitions of culture from several disciplines like anthropology, linguistics or business, pinpoint their respective relevance for robotics research and derive crucial challenges for developing culture aware robots. Based on this foundation we are going to look at three examples of culture aware robots and discuss their pros and cons in terms of creating culture aware robots.

References: [1] E. G. Blanchard, R. Mizoguchi, and S. P. Lajoie, “Structuring the cultural domain with an upper ontology of culture,” in Handbook of research on culturally-aware information technology: Perspectives and models, E. G. Blanchard and D. Allard, Eds. Hershey PA: IGI Global, 2010, pp. 179–212. [2] G. Hofstede, Cultures Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations. Thousand Oaks, London: Sage Publications, 2001. [3] E. T. Hall, Beyond Culture. Doubleday, 1976. [4] J. Allwood, “Intercultural communication,” in Tvaerkulturell Kommunikation (Papers in Anthropological Linguistics 12), 1985. [5] T. Ruotsalo, L. Aroyo, and G. Schreiber, “Knowledge-based linguistic annotation of digital cultural heritage collections,” IEEE Intelligent Systems, vol. 24, no. 2, pp. 64–75, 2009. [6] T. Clemmensen, “A framework for thinking about the maturity of cultural usability. in (eds.),,” in Handbook of research on culturally-aware information technology: Perspectives and models, E. G. Blanchard and D. Allard, Eds. Hershey PA: IGI Global, 2010, pp. 295–315. [7] M. Rehm, Y. Nakano, T. Koda, and H. Winschiers-Theophilus, “Culturally Aware Agent Communication,” in Human-Computer Interaction: The Agency Perspective, M. Zacarias and J. V. de Oliveira, Eds. Berlin, Heidelberg: Springer, 2012, pp. 411–436. [8] K. Reinecke and A. Bernstein, “Improving performance, perceived usability, and aesthetics with culturally adaptive user interfaces,” Transactions on Computer-Human Interaction, vol. 18, no. 2, pp. 1–29, 2011. [9] M. Rehm and K. Leichtenstern, “Gesture-Based Mobile Training of Intercultural Behavior,” Multimedia Systems, vol. 18, no. 1, pp. 33–51, 2012.

Shuzhi Sam Ge

Organisation National University of Singapore

E-mail samge@nus.edu.sg

Biography Shuzhi Sam Ge is the founding Director of Social Robotics Lab, and Professor of Department of Electrical and Computer Engineering, National University of Singapore. He received his BSc degree from Beijing University of Aeronautics & Astronautics in 1986, and PhD degree and DIC from the Imperial College, London in 1993. He has (co)-authored six books and over 300 international journal and conference papers. He has been playing a leading role in robotics and intelligent control. He serves/served as Vice President for Membership Activities, 2011-2012, and Vice President of Technical Activities, 2009-2010. He serves as Editor-in-Chief of the International Journal of Social Robotics, Springer, and served/serves as an Associate Editor for a number of flagship journals including IEEE Transactions on Automatic Control and Automatica, Book Editor for Taylor & Francis Automation and Control Engineering Series. He is a Fellow of IEEE, IFAC, and IET.

Abstract **Era of Social Robots**

Social robots are envisioned to become an integral part of our social fabric as we embrace the coming “silver” society. Across continents, governments have foreseen the needs of an aging population and funded a number of leading groups in universities and research institutes to focus on the research and development of social robots for improving services, healthcare and productivity. In this talk, I will first present a brief history of social robotics and the state-of-the-art in research and development. Then, I will introduce three social robots developed at the Social Robotics Laboratory of the National University of Singapore, including Carine for interactive edutainment, Adam for hospitality service, and Nancy for human robot collaboration. To appreciate the advanced technologies in making social robots possible, I shall describe the core technological modules, or building blocks, including locomotion, intelligent control, visuoauditory interaction, and artificial skin. Deeper understanding and further advancements in the modules can help us to make social robots become more appealing, more engaging, and ultimately better companions. As a community, we are working hard to make social robots help our “silver” society more vibrant, connected, and productive. Let me illustrate part of this big picture by presenting a few robots for different issues such as security, mobility, and productivity. Finally, I would like to conclude my presentation by giving a few futuristic scenarios how human and social robots live, work, and enjoy life together happily.

Christine Linke

Organisation: Independent researcher and lecturer

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Biography: Christine Linke, Dr. phil., is a communications and media scholar based in Berlin, Germany. She has received a doctoral degree from the University of Erfurt, Germany. Her research focuses on media and technology in everyday life and in social relationships. She is working on theoretical questions regarding and ritual interaction and the delimitation of communication processes. Furthermore she has been involved in empirical projects on gender and media at the Free University of Berlin. During her last position as a Guest Professor at the Berlin University of Arts she has been teaching and researching in the area of Sociology of Communication.

Abstract

Phenomena of Human-Social Robot-Interaction: The Social Construction of Reciprocity, (Inter-)Subjectivity and Relationship

The presentation is aiming at an exploration of several phenomena of human-social robot-interaction that are crucial in order to create an understanding regarding the arrival of social robots in people's daily lives. The analysis hereby concentrates on the relation between human and robots-related technology. This perspective includes the situational context of an interaction episode and implies furthermore aspects of actual relationships established between humans and humanoid technology. Building on different social theories, e.g. symbolic interaction and ritual theory, a broad focus on the social processes that occur when humans interact with different forms of technology is enabled: Reciprocity will be one aspect, clarifying the impact of social norms in human-social robot-interactions. Furthermore it is discussed in how far certain subjectivity can be created in human-social robot-interaction. And finally it is argued if and how the concept of a relationship can be applied for human-social robot-interaction.

Amparo Lasén

Organisation Universidad Complutense of Madrid

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Biography Amparo Lasén is PhD Sociology (Université Paris V-La Sorbonne). She is Professor of Sociology at the University Complutense de Madrid. Her research focuses on the usages, practices and presence of ICTs in relationship with affectivity, intimacy and the configuration of contemporary subjectivities. She was the Vodafone Surrey Scholar at the DWRC of Surrey University, where she conducted cross-cultural research on mobile phone practices. She has been academic visitor at the Department of Sociology of the LSE and researcher at the CEAQ (Centre d'Études de l'Actuel et du Quotidien) Paris V-La Sorbonne. A list and copies of her publications can be found at http://ucm.academia.edu/AmparoLasén

Abstract

The Shared Agency between People and Technologies in the Context of The "Affective Paradox"

Social robots are defined as being autonomous or semi-autonomous agents with a physical embodiment that communicates and interacts with humans and with other agents, therefore subject to human and non-human conventions, and to cultural dynamics and feedbacks. Though this term seems to point to the existence of a kind of non-social robots, it happens the same as with the term social medial, there is no such thing as a non-social media, or a non-social robot, first because all of them are bound, one way or another, to social actions and interactions, framed and shaped by social values, norms and standards, which, in a feedback loop they contribute to sustain, challenge and modify; and second, because what is social is not only defined by people, but by our material environment as well Technologies are part of this environment, quoting a well-known anthropologist of science and technology, Bruno Latour, "technology is society made durable". Drawing on my research on how everyday uses and practices of ICTs are contributing to the transformation of intimacy, affectivity and subjectivities, I will explore some of the implications of our growing intimacy with technologies and the habit and expectations to share our agency with digital devices in everyday life, as well as the increasing affective attachment to such particular objects. My research focuses specially on mobile technologies, such as mobile phones, that can be conceived as kind of social robots deeply involved in the mutual interaction and shaping of humans and machines. Technology uses and practices entail forms of shared agency between people and devices, where both entities are reciprocally affected and mobilised, where uses are the result of negotiations and clashes between technical affordances, commercial conditions and people's intentions, aims, habits and obligations, and where non-intentional as well as non-conscious aspects are involved. This shared agency is a dynamic and learning process where all these aspects

(affordances, conditions, norms, intentions, habits, experiences, emergences) are subject to change too. It entails forms of collaboration and conflict, enacted in complex learning processes involving different individuals, collectives, institutions and regulations, where we act upon technologies at the same time as we are acted upon by them. Therefore ways of doing, acting, performing, knowing, seeing, hearing and feeling are effects of the shared agency between people and devices. Technological uses and practices reveal affective attachments to the devices, to the applications and to other people. The ubiquitous presence and uses of ICTs entail their participation in the emergence, shaping, display, management, control, expression and experience of positive and negative emotions. Feelings, affects and emotions are being inscribed in and by smartphones, digital cameras, social network and sharing sites, blogs and microblogs, etc., as texts, images and sounds, contributing to the materialisation of emotions and feelings. These affective inscriptions increase our reflexivity and the sharing of emotions, the attachment between people and devices, as well as the mediated attachment and attunement to other people. These inscriptions increase the ability to read and keep track of affects and relationships, contributing to the shaping of our affective cultures. Affects become things that we can manage, count, weight, compare, read, share, interpret and take distance to. This “we” reading and listening to these affective inscriptions afforded by digital devices cover divers agents with different and sometimes conflicting agendas: people involved in different interpersonal relationships; designers and engineers thinking in terms of “affective bandwidth” or emotional usability; commercial agents leading marketing strategies; or public authorities engaged in the somehow “schizoid” task of trying to gather information about their citizens, as well as trying to control who makes these affective inscriptions and how are they made. Therefore these devices are taking part as well in the social learning processes of affective experience and communication, in our contemporary sentimental education. This technologically mediated social choreography of interactions and affects can elicit disquiets as well as reveal and produce vulnerabilities. For instance, as it facilitates different forms of control: self-control, control over and by significant others, and institutionalised formal modes of social control, that can elicit conflict and controversies. The increased visibility and reflexivity facilitated by digital inscriptions reveal as well the ambivalences, frictions, inaccuracies and failures of current definitions and limits regarding gender roles, affects, intimacy and its link to the private/public divide. These dynamics entail social, political and aesthetical implications. Therefore when thinking and designing about the affective implications of forms of interaction between humans and robots, we have to situate this choreography inside the whole dance, this is, the complex and increasingly technologically mediated network of social obligations, habits and expectations in which these interactions take part. Some of these disquiets emerging in digital practices are related to affective paradoxes produced by our main conceptions about emotions and by the different facets of our emotional labour in everyday life. This ambiguity is stressed by contemporary conceptions of emotions as they are popularized by advertising, corporate management strategy or commercial media, with that double rhetoric about the importance of being passionate, spontaneous and involved, but also of being in control of what happens, of one’s life, relationships, activities and feelings. In these brief accounts of contemporary subjectivities that are the self-

presentation profiles of online dating sites, this double character of being passionate and spontaneous, but in total control as well, is found very often. There is a double bind paradox about self-control and spontaneity also which points to the ambiguous status of intentional behaviour. Affectivity is a sign of authenticity, a mark of our true self, but at the same time affects, as passions, are considered to have the power to drive yourself away from your sense. Therefore when being authentic and acting according to our emotions, passions and feelings we could be at the same time out of our selves. The idea of the authenticity of affects resides in the notion that they are visceral reactions prior to perception, non-conscious and out the reach of the individual and social control. As if socialization and individualization were a fake cover over our true self. But affects and emotions are source and effect of attachments: to other people, ideas and things. Therefore affective authenticity would be linked to attachments, subjections and dependencies, putting at risk as well the common view of the true and authentic self as an autonomous one. The descriptions and implications related to current dualistic ways of thinking about affects and emotions, highlighted by the growing technological mediation of social interactions and affectivities, could produce some useful insights for approaching the designs, uses and foresights of social robotics.

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Biography: Ph.D in Science of Mind, Psychology Dept. SUN, she received a degree in Psychology from SUN in 2007, where in 2008 she collaborated at the research project “Qualitative and quantitative analysis of invariant features of fundamental emotional expressions for the implementation of intelligent avatars and interactive dialogue systems”. From 2008 to 2011, she was Working Group Member of COST ICT Action 2102. From 2009 to 2013 she was Ph.D (fellowship) student in Science of Mind, Psychology Dept. (SUN). Since 2009 she has been collaborating at IIIASS, working on Multimodal Expression of Emotion. Since 2010 she is a member of EUCOGII. Her current research interests are on verbal and non-verbal communication, and in particular on cross-modal analysis of speech, gesture, and facial expression of emotions.

Abstract

A Cross-Cultural Study on the Effectiveness of Visual and Vocal Channels in Transmitting Dynamic Emotional Information

This work aims at examining emotion recognition within and across cultures. It reports on a set of perceptual experiments designed to explore the human ability to identify emotional expressions dynamically presented through visual and auditory channels. Two cross-modal databases of dynamic verbal and non-verbal emotional stimuli based on video-clips extracted from American and Italian movies, respectively, were defined and exploited for the experiments. The databases allows a cross-modal analysis of audio and video recordings with the aims of identifying distinctive, multi-modal and cultural specific emotional features from multi-modal signals, as well as for defining methodologies and mathematical models for the automatic implementation of naturally human-like communication interfaces. In the first study, American, French, and Italian subjects were involved in a comparative analysis of subjective perceptions of six emotional states dynamically portrayed by visual and vocal cues, exploiting the database of American emotional stimuli. In the second study, American and Italian subjects were tested on their ability to recognize six emotional states through the visual and auditory channel, exploiting the database of Italian emotional stimuli. The aim is to investigate if there exists a difference in the efficacy of the visual and auditory channels to infer emotional information and if cultural context, in particular the language, may influence this difference. This hypothesis is investigated including as participants in each of the two studies, one group of native speakers of the language, belonging to the same cultural context of the video-clips used as stimuli (i.e. American subjects for the American stimuli in the former study, and Italian subjects for the Italian stimuli in the latter one). Results showed that emotional information is affected by the communication mode and that language plays a role.

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Biography Juha Röning is Professor of Embedded Systems and head of the Department of Computer Science and Engineering at the University of Oulu. He is principal investigator of the Intelligent Systems Group (ISG). In 1985 he received Asla/Fullbright scholarship. From 1985 to 1986 he was a visiting research scientist in the Center for Robotic Research at the University of Cincinnati. From1986 to1989 he held a Young Researcher Position in the Finnish Academy. In 2000 he was nominates as Fellow of SPIE. He has two patents and has published more than 250 papers in the areas of computer vision, robotics, intelligent signal analysis, and software security.

Abstract **Natural Human Robot Interaction**

We believe that in 15 years servicing robots will become a part of our everyday lives. Such robots could take care of many routine tasks that previously required human labor. As these robots are working in the same environment as humans, they must be able to interact with each other in a way, which is natural to humans, but also conveniently without requiring too much effort. Therefore, in our future scenario, the human-robot interaction can take place locally in a "face to face" manner as well as remotely using a mobile device and wireless communication. The mobile device provides a bidirectional affective connection between the user and the robot to convey their presence to the remote site. For example, a domestic robot could sense the presence of each family member despite their physical locations, but also the human could interact with the robot in the same way as it would be nearby. The objective is to develop leading edge approaches for affective human-robot interaction (HRI) in smart Ubicom environments. An intelligent robot should be able to detect and identify the user in order to personalize its services and guarantee security, it should recognize user’s emotions to allow affective interaction, and it should be able to communicate easily with the user and understand given commands by recognizing speech and gestures. Our research is motivated, for example, by the emerging needs of elderly care, health care, safety, and logistics.

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Biography: Stefan Benus has been an Associate Professor of Linguistics at Constantine the Philosopher University and a researcher of Slovak Academy of Sciences. His research includes the issues of pragmatic meanings and dominance in conversational speech, aspects of turn-taking, and the relationship between speech meanings and its acoustic and articulatory realizations with special emphasis on prosody. He is also interested in applications of these issues to speech processing (especially to spoken dialogue systems and human-computer spoken interaction) and foreign language teaching and acquisition.

Abstract

Social aspects of entrainment in spoken interactions

Speech entrainment is the tendency of interlocutors to become similar to each other in terms of their acoustic and prosodic production and relates to cognitive and social aspects of communication and information transfer. Some aspects of speech entrainment appear to be almost automatic, employing lower levels of the cognitive communication systems, while other aspects tend to require higher cognitive functions. Moreover, entrainment observable in spoken modality may be linked in non-trivial ways to entrainment in gestures, body postures, and other aspects of visual modality. Social aspects of spoken entrainment include the findings that humans perceive conversational partners who entrain to their speaking style as more socially attractive and likeable, more competent and intimate, and conversations with such partners as more successful. It has also been shown that humans may consciously decrease their similarity to others in order to increase their social distance to the interlocutor or to show a negative attitude toward the interlocutor. Importantly for social robotics, not only do humans entrain to other humans, but studies have shown that they also entrain to computer systems and that subjects do adapt to machines as well as to human conversational partners. A better understanding of entrainment is thus important for all applications in human-machine communication that rely upon Spoken Dialogue Systems. Due to the naturalness of spoken modality for humans, human-robot interactions are likely to rely heavily on speech and the social aspects of these interactions will play a major role in the advances in the field of social robotics. Hence, the ability to mimic the tendency for entrainment in human-human conversation appears to be important for human-machine conversation as well, if social robotics systems are to be as natural and effective as human partners. I will discuss recent research in the area of spoken entrainment aiming at cross-fertilization and sharing with engineering and applications communities.

Harmeet Sawhney
Working Group Chair
Sessions III and IV (12 June)

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Biography

Harmeet Sawhney is Professor and Director of Graduate Studies in the Department of Telecommunications at Indiana University, Bloomington. His research interests include telecommunications infrastructure planning and policy, evolution of telecommunications networks, and the use of metaphors in the design of new technological systems. He is currently serving as the Editor-in-Chief of The Information Society.

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Biography He holds a grade with honours in Architecture, and holds a degree in Audiovisual and Multimedia Communication Technologies. He teaches geometry, architecture and interior design at Art and Design High School. He was also supervisor for teacher training students specializing in Art and Design at SSIS, University of Latium, Italy. He served at the Planning Department of the Ministry of Public Education's General Board, coordinating the management and organizational aspects thereby involved. He has written several papers and essays. He attended as panelist several conferences and seminars on education, and was partner in the project Teaching Mathematics at University Sapienza, Roma, Italy. He has collaborated with C.I.R.D University of Trieste. He was member of the XPLORA Teacher Group. He belongs to the Working Group for the development of tecnoscientific Knowledge, and to the Editorial Board of the magazine Education 2.0.He is involved in researches on ICT and Education.

Abstract

Cad software to introduce robotic design process at school

It is sufficient to take a glance at a high school textbook and to compare it with a similar textbook of twenty years ago to realise the extent of the changes in the teaching process of communication: images, charts, diagrams occupied a significant space within each chapter, combined more and more frequently with a CD-ROM or a web application that provide simulations and exercises to be used with the reference text. According to this trend, it is natural to ask ourselves whether it is a really deep "revolution" or if, even today, the cultural model is still based on the sheer learning of coded knowledge, just using the ITC as a medium to enhance that knowledge. The shifting of the focus from a learner/user model – as the use of slides during a lesson – to the operational/laboratory one, leads to reconsider from a different point of view both the used language and the strategies of the whole teaching process when ITC are adopted. In other words, we tried to move our attention from the process of communication of didactics to the cognitive process of knowledge building characterized by ITC. Thus, also the construction of a simple dynamic digital image appears a s a paradigm aiming to highlight the algorithmic procedure of the linguistic process that tends to create an object that can be handled, having as a final target the representation of a phenomenon or the conception of a solution for a given problem. This is a concrete process of reality modelling. The hypothesis underneath assumes that ITCs can constitute a higher pedagogic relevance if, by the use of them, we push the students to directly experiment learning paths of scientific or technologic type. In the specific situation few simple examples of robotics were introduced in the learning plan of Art High School (spec. Design) in order to experiment

the knowledge of 3D modelling. Robotics was used to retrace and investigate some robotic objects through the graphic simulation. The robot was at first disassembled into its parts, so to understand the functioning mechanism, then reassembled by 3D digital drawing. The graphic model was then compared with the real robot and to each element was given a function, classifying the parts designed for perception (position and contact sensors, cameras) and those designed for action (movement parts). The movements were simulated by the graphic model by the means of a software that manages the animation of 3D models and were eventually tested with the real robot. The physical and graphical models were then compares and evaluated by the students with a comprehensive discussion upon the meaning of physical and virtual reality and on the possible connections of these two aspects of experimentation of a design prototype. To conclude the learning path few examples of augmented reality were examined using some apps for mobile telephones.

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Biography Chung-tai Cheng gained his Ph.D. in Sociology from the Peking University in China. He is currently Teaching Fellow in the Department of Applied Social Sciences, The Hong Kong Polytechnic University. His research interest is in the topic of the social and normative implications of Information Communication Technology (ICT) use in contemporary China. His presentation 'Imagined performativity: the great virtue of cyberspace in contemporary Chinese workers' social lives' won the Best Presentation Award in COST Action 298 Conference: the Good, the Bad, and the Challenging in the year 2009. He has published several journal articles and book chapters and presented conference papers, mainly focusing on social and cultural impacts of ICTs.

Abstract

The technologicalization of education in China and the case study of Home-School Communication System

Since 2003, primary and secondary schools in China have started introduced a SMS service provided by China Mobile, which provides a new form of communication between teachers and parents. With the advancement of mobile technology and computer programming and the prevalence of smartphones, however, such kind of medicated communication in education may even gradually transform the relationships between different stakeholders. The powerful communicative system not only takes over some tasks that teachers and parents had been expected to perform and fulfill in the old days, but also it creates a social-technological based schooling environment. This phenomenon probably changes the roles of teachers and parents, and even the culture of Chinese education. First, the presentation will introduce Home-School Communication System (Xiaoxuetong) in China, particularly on how the communicative system takes over part of the roles of teachers and parents. Second, it will look at how different stakeholders comment on the changes of schooling environment, focusing on the relationships between teachers and parents, and between teachers and students. Third, it will discuss the implications of the technologicalization of education in China and examine how it influences the traditional understanding of Chinese education. The whole discussion is based on five in-depth interviews in Beijing.

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Biography Michele Viel graduated in pedagogy in 2005 at University of Udine and he is currently a MA student in Multimedia communication and information technology at the same university. He also works as pedagogist at the Department for mental health of the Public health authority of Udine district (Friuli Venezia Giulia region). He is an Arduino enthusiast, a skilled programmer and a multimedia artist. He is interested in merging disciplines such as children education and mental health prevention with robotics, new media and art.

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Biography Giovanni Ferrin received the Laurea degree cum laude in Philosophy (Natural language semantics) from Milan University and a PhD in Multimedia Communication from the University of Udine. Since 1999 he has been in charge of the multimedia and audio/video labs of the Degree in Multimedia Sciences and Technologies at Udine University. He is currently a TA and research assistant at the same University. His research interests range from the main theoretical topics in the domain of Information Fusion to states and events theory, context exploitation, abductive reasoning and other forms of reasoning under uncertainty for situation awareness. He is a reviewer for the International Journal on Multi-Sensor, Multi-Source Information Fusion. He is member of the IEEE.

Abstract **Taming social robots through playfulness and do it yourself: children in action**

It has been shown that adults can feel quite uneasy about new technologies and can, in particular, be troubled by the introduction of social robots into their domestic life (Taipale, Sarrica, de Luca, Fortunati, forthcoming). At the opposite extreme, children seem to be quite entertained by such technologies since their world is populated by toy robots (dolls representing a form of proto-robot, and robot transformers

being quite a common children's toy) and robot movie and cartoon characters. This work reports on a series of laboratory experiments carried out in Udine, Italy which required three groups of same age secondary school children, aged 11-12 years old (one composed of 4 males, another of 4 females, and the last of 2 males and 2 females) to construct from the very beginning simple robots in a laboratory. The educational guidelines, mechanical concepts and narrative ideas of the experiments are based on the philosophy of the Do It Yourself movement and on several existing research groups, among those worth mentioning being: a) the CLOHE project devoted to enable primary classroom teachers and their students to build moving toys (called Automata) in order to widen their experience and learning competencies; b) the PIE institute project consisting in a network of educators exploiting practical educational activities to teach science, art and technology; c) the High-Low tech group that developed LilyPad platform; and d) the Code Club Project whose aim was to teach children, aged from 10 to 11 years old, to assemble and programme their own operating system and hardware. The reported experiments aim to assess, first of all, children's attitudes and feelings toward robots by investigating: 1) children's emotional reactions when engaged in building robots from scratch, during the assembling and completion phases 2) their ability to understand the functioning of simple mechanisms (levers, linkages, pulleys) and the use of simple tools and materials (screwdrivers, scissors, glue, stickers, cardboard) as well as to assess their cognitive planning behaviours when combining tools and mechanisms in constructing artistic robots. 3) the way cognition, creativity and new individual potentialities develop because of shared meanings which are captured and understood by sequences of group actions. These group actions occur through interactions by means of a series of multimodal signals (visual and audio information that singularly or combined characterize relevant actions for collaborative learning and shared understanding). The analysis of the interactions between children and robots is carried out by using video-recordings of the children at play. Transcriptions of the dialogues and analysis of the interactions will be initially based upon the Interaction Process Analysis (IPA) methodology which includes 12 Interaction Process Categories as defined initially by Bales (1950) and revised by the current literature. To understand children's emotional reactions and behaviours during these experiments both the stream of consciousness or optimal experience and social learning theories will be applied and tested, as well as important theories from social and cognitive psychology, such as distributed cognition, activity theory and ethnomethodology. These theories suggest that group interactions play a central role in the development of new creative cognitive processes that both resemble and differ from individual cognition and creativity. The preliminary observations support the above theories confirming children abilities to learn easily from building and inventing. In addition, when they are in a state of "play" consciousness children turn out to be more productive and creative than during a "normal" state. It was also observed that while building up their homemade robots, children tended to become more and more confident in establishing an emphatic relationship with them and attributing human behaviours and needs to them. Such observations on the one hand confirm our preliminary hypothesis concerning children's sense of ease at using technology and in particular robots. However, they do not

answer the following questions that are, thus, worth investigating further : Do children's feelings change when dealing with pre-packed robots? Do children adopt a different behaviour toward a homemade robot compared to a pre-packed one? Do they show the same attitude toward home technology, such as vacuum cleaner robots (navibot, roomba, etc)? Do children attribute the same meaning to the word "robot" as they do to "toy"? Or will they expect some differences? And, if this is the case, which features characterize a robot (body movements, speech, ability to interact, changes in facial expressions, eye contact?) The elements and phases of these experiments are reported below: Materials: old mobile phones, toothbrushes, paper, toothpicks, skewers, tape, hot glue, wire, LEDs, battery tablets, tooth brushes, cardboard, tin, copper or aluminium film, straws, adhesive and double-sided tape. Tools: scissors, small screws and welders, glue gun, hot colours, soft pencils, clubs and graduate sticks. Technical steps: children know that the mobile phone is a tool for communicating and getting new information. However, children ignore the inside of a mobile phone and do not know the number of components it is made of. Therefore the technical steps are: 1) Open old mobile phones and disassemble them in order to identify the motor Vibracall. In order to do this, children need to learn to use very small screwdrivers and recognize the basic components of a mobile phone 2) Identify and remove the Vibracall from the mobile phone's shell 3) Assemble the Vibracall, battery and toothbrush in a single unit that moves by itself 4) Integrate, if possible, a LED , into the single unit to have more special, "magic" effects. Artistic and narrative steps: 1) Invent and write a short story and a character to indicate further ways to develop the robot 2) Sketch their own robot 3) Design the parts that will compose the robot and the simple mechanisms that must be used 4) Assemble the various parts (cardboard and wooden skewers with glue and scotch tape) to obtain a ready-to-go robot, with its own personality! Mechanical steps: 1) Imagine which simple movements you want to attribute to the character (raise arms, move a sword, turn the head ...) 2) Set up and run them through a pulley that turns the unidirectional movement of the ready made engine unit created earlier, in a circular motion so that levers and linkages can be added and the robot can acquire its own life, and move its limbs 3) Show that the final robots can interact together in a small arena, moving around, bumping, chasing, dancing altogether in a magical mess. Social and psychological steps: Children can: 1) build a common cultural starting point and share a common path and experience together 2) interact and improve their relationships with the members of the group 3) develop social learning as to how technologies are made and work 4) improve their own technological self-efficacy by **having at the same time a lot of fun and satisfaction.**

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Biography Teaches in a kindergarten school. Graduated at the University of Ferrara, Italy. ICT Consultant of seminars; training courses; educational tv programs. As path and progress facilitator of the Teacher in Hospitals training course. She is school trainer and coordinator of many Ministry projects. She has collaborated with University of Trieste. She is consultant and editor of educational materials. She has published several papers and essays. Supervisor for the traineeship at the the University Roma3. Member of the Editorial Board of National Catalogue of Video and Multi-media Products for Education. Partner in the European projects; national co-coordinator of the Environment for Young Europeans website of the European Schoolnet. Involved in European projects and in Educational Robotics. She received the 2009 Special Awards School by Museo della Scienza e della Tecnologia (Milan) Tecnovisionarie 2009, and she is eTwinning Ambassador.

Abstract **Pinocchio 2.0, robot and other stories**

"Once upon a time ... - A king! - My little readers will say immediately. No, guys, you are wrong. There was once a piece of wood" ... and ... that piece of wood in our project Pinocchio 2.0, represents the realization of ideas, dreams, aspirations, desires of children and adults; becomes, therefore, any "object" or "subject" constructed and / or shared -in presence or through the network- by several traveling companions, who take the role of "Geppetto", because they "make" concrete, alone and / or in a collaborative way, an art work, a story, a drawing, a video, a robot ... using both recycled material and the potential offered by Web 2.0 and open source. The project Pinocchio 2.0 is been aimed for years to create a community for learning and to develop skills of technological nature - science, including through the implementation of robotics labs; up to now it has involved more than 2000 people (both at hospital and not): • children (kindergarten, primary school); • adolescents (secondary school first and second degree); • teachers, both retired and not (from kindergarten to university); • trainees (university students); • externals observers (from research institutes, universities, ...); • parents, grandparents, ...; • experts • writers (1) A basic aim of Pinocchio 2.0 is the assessment of learning arising from the use of one or more collaborative "environments", real or virtual. In addition to the "traditional" work, it also makes use of educational ICT-mediated learning that take into account: • of need of expression and communication of students; • of what has been done in previous years, to give continuity to the experiences already carried out; • of guidelines, national guidelines for the curriculum; • of educational and training opportunities offered by the development of multimedia; • of the coordination with colleagues working in other schools in Italy and abroad. Pinocchio 2.0 was chosen as the "fil

rouge" able to connect educational and teaching proposals offered by the schools that form of the network. Pinocchio was the first "robot" that, becoming animated (not due to the results of technological research, of course, but for a strange and wonderful magic), taught something to the children. Pinocchio is the "representative" of the "fragility of childhood." About this, the children of the schools in the hospital taking part in the project are not in front of a super hero, but a "fellow traveler". Pinocchio, although subject to the mutation of its body - as well as the children, that see their own bodies change due to the "disease," and not only to the "growth" - turns out to also be able to find a way "out" and towards the "defeat" of the illness ... The project has brought Pinocchio 2.0 close to the Robotics Education and the ITC in an attractive, balanced, creative, funny and easy, strongly supported by direct and concrete experience resulting from the reality. Timetable of the project: 2002 Pinocchio 2.0 in virtual worlds (2) 2003 Pinocchio 2.0 and robotics (3) 2008 Pinocchio 2.0 in eTwinning (4) 2009 Pinocchio 2.0 social networks (5) 2012 Pinocchio 2.0 in Segni di Segni (6) ... to be continued This project in October 2012 was awarded the prize of the President of the Italian Republic, which is to be awarded to the most innovative projects made by Italian schools. (7) Activities: Meetings in person, e-mail, chat, mailing lists and other means of communication synchronous / asynchronous build bridges, nets. Social networks, wikis, blogs, podcasts, youtube videos are some of the many places in the project where there are imagination, creativity related to science, ICT, robotics and suggestions are welcomed, songs, movies, memories, trivia, games, links to material information, virtual images static, dynamic, photos, drawings, free software, "diverging stories", and much more. These sites also provide documentation (always available) of the path with the dual function of keeping the connections among the different components of the network and to always give new input to the attendees. The project will then make use of: - Sending e-mail to schools that are part of the network design [by all those who are included in the mailing list of the project and use it in an active form]; - Printing e-mails to colleagues who do not have access to email [by the project co-ordinator]; - Collection of materials to be sent, even by post parcel, to schools belonging to network project [by the project co-ordinator]; - Documentation online Blog MIUR project [ref. prg Web-X] - Use of microscopes Intel ® Play ™ QX3 ™, active worlds, of microworlds, kits mindstorm robotics, open source software and social networking The places of the project Pinocchio 2.0 change, born or die according to the will of individuals or groups. The flexibility of the instruments and, at the same time, their specificity allows different articulations of common speech and immediate access to resources. Conclusions The project is in constant evolution and we do not consider it finished. At any rate the several micro paths started within Pinocchio 2.0 have broken down the barriers of distance, not only physical (thanks to ICT), but also that inherently due to the largely different ages of the participants [from childhood to adolescence]. The advantage was the strengthening of comparison, the co-construction and sharing of different skills. We are happy to have working with us retired colleagues, experts, former students of SSIS and parents. About the students involved in the multiple paths, the project takes into account the needs of expression and communication of each, implemented by the use of various techniques. The different "Pinocchios" made in the form of stories, drawings, artworks, are also shared across the network. The project is based on pre-existing networks of schools with experience in

educational robotics. Robotics becomes an instrument, a means to create and promote collaboration among different schools, among students of different cultures and ages, including teachers and experts in the field. The technologies used in addition to the robot (imagined, designed, built and programmed) are computers, open source software, webcams, websites, youtube (8), social networks, blogs, chat audio-visual, mobile phones, cameras and digital cameras.

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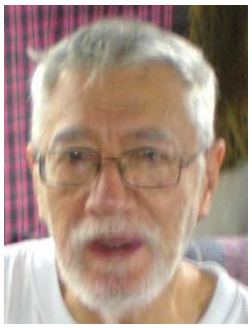
Biography Ryad Chellali is a senior scientist at the Department Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia. He obtained his PhD in Robotics from University of Paris in 1993 and his Dr. Sc from Univesrity of Nantes (France) in 2005. His main research interests include robotics, human robots interactions, human behavior analysis (social signal processing and a
ffective computing). Telepresence virtual and augmented realities, are also keywords of his activity. He worked in 1992 at the French Institute of Transports (INRETS). From 1993 to 1995 he was ass-prof at University of Paris. From 1995 to 2006, he joined Ecole des Mines de Nantes(France), heading the automatic control chair. He joined IIT in 2006 as a senior scientist, where he created the Human-Robots Mediated Interactions Lab. Ryad Chellali co-authored more than 100 papers. In 2000 and 2005 he was awarded by the French Government "Creation of innovative technologies".

Abstract **The Social Robot: myths, reality and perspectives**

The engineering approach to find working solutions is a three steps process: what, why and how. Indeed, for an engineer to promote their work, he or she follows the known convincing sequence: What is the problem you want to solve, why your solution is/will be unique, and finally you show that your solution is/will work, is robust and cost-effective. For social robotics, we know why we need social robots: they could help elderly or disabled people, in terms of their social lives, etc. On the other hand, we invent some toys problem (simplified problems solved under controlled conditions) to convince others (and ourselves) that social robots can work (the HOW). Importantly only few of us can specify exactly what is a social robot. There is no absolute need to define “social robotics” and it seems that it is also not absolutely necessary to define the means to demonstrate that our research will lead to effective solutions. However, we have to keep in mind that two fundamental questions are pending. My presentation starts by listing some of the myths in and around robotics, in order to understand the current state of robotics. I continue with describing my own experiences in addressing problems of human-machines interactions. I finish with my vision of the future of the social robotics and the means to achieve the specified ends. Myths in and about robotics Before addressing the robotics myths, I first introduce some historical facts about artificial intelligence and control theory and their relations to robotics. Indeed, AI suffered and is still suffering since its origins. In the 50’s a group of researchers established a roadmap for developing this field for the following 20 years. AI was considered as the absolute way to solve any kind of problem, far beyond human capabilities. Robots at that time were

considered no more than printers: just a terminal allowing displaying the power of AI. The 50’s roadmap was in fact lacking at least two crucial points: i) that intelligence needs embodiment; ii) that similar problems may have a variety of alternative solutions. The first point discarded de facto all the developmental/evolutionary aspects of a system working within physical environments. The second point delayed all the stochastic and bio-inspired approaches from being used as successful solutions to handle complex and real-life systems. The second myth in robotics is related to the control theory. This theory, given a model of the world, allows generating optimal controls to command any dynamic system and make this system perform exactly as predicted or desired. This theory worked perfectly for simple and simplified worlds (with hundreds of state variables), however it fails when facing complexity, mainly, when humans are present in the control loop. The list of myths is non-exhaustive and we can continue by pointing out the way existing theories have been misused. Such a list, however, enables addressing the specific problem of our interest: the human-robot hybrid system. Current general trends in robotics contrast with previous approaches. Robots are today the central objects of research: we develop and adapt techniques and methodologies for the robot itself rather than using it as a demonstration platform. This shift allows crystallizing efforts on a single technological object and enables performing a vast amount of research leading to many fundamental and practical advances. However, roboticists should keep in mind that these successes are also the fruits of the continuous cross-fertilization and inspiration across disciplines. Some experiences I'll give two types of collaborations I have had in the past. From each, I got different outputs and lessons about the necessity of addressing the SR issues within cross-disciplinary frameworks. The first example is concerned with the work we have done with Neuroscientists, and specifically from neuroscientists dealing with motor control, to investigate sensory-motor coupling in reaching for objects. This research showed us that the embodiment is a key aspect, and coupling of perception and motor control could improve our understanding of how motor actions improve perception. It took 3 years before obtaining the first results. Most of this time was dedicated to understanding each other’s approaches and to have clear ideas about mutual expectations. Last piece of research has been done with colleagues from experimental cognitive psychology. We joined our efforts to answer a simple but fundamental question: does the robot’s shape affect the way humans represent robot actions? Beyond the research-line itself, the principal success is the fact that after years of discussions and exchanges, we found, after three years a common language to address exactly the same key question from different angles; rather than having representatives of each of the discipline tackling different questions without a common overarching line of thought. I’m convinced that most of people addressing issues related to social robotics experienced similar situations and found that multi-disciplinary ways are the most effective. The manifold approaches developed by SR community are nowadays a reality and should be strongly encouraged. However, one should be aware that this is an iterative process, which needs time. The future of social robotics Social robotics is in its infancy and needs to be strongly stated as a research discipline. SR, by essence, investigates humans in the presence of robots (e.g, the robot as stimuli generator), or robots interacting with humans (e.g. HRI). There is a clear dichotomy of studying separately

robots on the one hand and humans on the other in addressing SR issues and this is reflected in the literature (conferences, journals, etc.). SR should shift to a new paradigma: the human-robot system as a central research topic. This idea itself is not new and many similar ideas have been proposed in the past. However, considering the HR system as a whole: a unique system treated as a unit of examination, should remove confusions, redundancies and should open doors to new fundamental questions. Mixing different research areas in a well-organized way will be the key of success for SR. We have in mind many of the domains that should be involved at different levels: Sensing, data-mining, signal processing, machine learning, statistics, control, mechatronics, design, cognitive sciences, psychology, experimental psychology, cognitive psychology, neurosciences, neuro-cognition, neurophysiology, motor control, developmental sciences, linguistics, social sciences, material sciences, etc. This list is an open one and has to be filled and extended to new topics. The efforts in developing SR should consider at least two main directions: 1) Developing a strong and open community, 2) Grounding the scientific foundations of SR. a) Some ideas to develop the SR community Classical communication tools should be setup to allow potential contributors to be involved in the development of the community (datasets, websites, dedicated workshops). • b) Some other ideas to strengthen common scientific basement of SR Here also, SR community should develop usual paths toward creating the right ecosystem allowing having fast and fruitful exchanges. • Encouraging the creation of a “common language” through summer schools, • Creation Open sources repository,



Raul Pertierra

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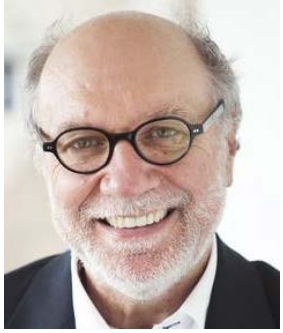
Biography: Social anthropologist currently residing in the Philippines and doing research on the new media and migration. He has written several books on mobile and the internet use among Filipinos as well as articles in major journals on politics and the new media.

Abstract

The person in the machine: the machine in the person

The Philippine poses certain paradoxes when it comes to the relationship between technology and society. It accepted western technologies almost as soon as they were invented in the West but, unlike Japan, the only other Asian country that also quickly absorbed western inventions, the Philippines remained technologically undeveloped. Culturally, the Philippines prides itself on being the only Christian country in Asia and boasts an affinity with western culture unsurpassed in the region. The only exception to this lack of technological innovation is the case of mobile phones and the new media. Here the Philippines often surpasses even its western counterparts. Why is this so?



Joachim Höflich

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Biography Prof. Joachim Hoeflich is a professor and researcher of communication studies at the University of Erfurt. The fields of his teaching and research expertise include media use and effects, media change, media integration, mediated interpersonal communication, mobile communication and communication and relationships with media such as social robots.

Afifa El Bayed

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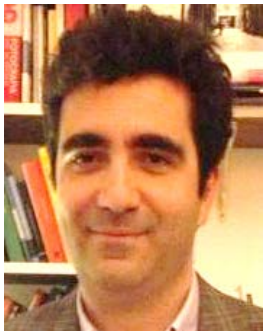
Abstract **The Acceptance of Social Robots in Today's Germany and its Prospects**

In our presentation, the first node of a longitudinal exploratory study led by Prof. Dr. Hoeflich will be put forward along with its findings. The longitudinal study in question aims to measure the evolution and/or change in the perception of social robots - especially in terms of their acceptance - in the German context and over a considerable number of years. In late 2012, a first attempt to measure the earlier cited phenomenon took place, enabling figuring out how the previous contact with social robots, their functionalities, proxemics and the demographics of the people interacting with them could have an impact on their acceptance. The attained results were reached based on the quantitative analysis of the data collected online through the use of a questionnaire. This later was designed on the basis of earlier theoretical work in the field, of former empirical findings worth reinvestigating about, as well as of the results of a led qualitative preliminary study which put the light on some specificities of the research topic within the German context. In early 2013, another research complementing the former was led, enabling on one hand the qualitative unearthing of the reasons behind the variations in the acceptance of social robots. It also permitted on a second hand the verification of some major findings of its predecessor; finalizing hence the initial building block in a chain of academic inquiries about social robots' acceptance in a specific European context.



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Biography Nello Barile teaches Media studies and Sociology of cultural processes at IULM University of Milan where he is the coordinator of the Master programme in Creativity Management. He holds a PhD in Communication sciences, resources management, and formative processes at University of Rome “La Sapienza”. He has written many books, articles and essays in Italy such as the recent Sistema moda. Oggetti strategie e simboli dall’iperlusso alla società low cost (Milano 2011) and Brand new world. Il consumo delle marche come forma di rappresentazione del mondo (Milano 2009). He also published articles and short essays in France, Brazil, and USA, such as “A knot to untie. A social History of tie between fetishism, communication and power” in P. Rabinowitz, C. Giorcelli, eds. C. Giorcelli & P. Rabinowitz (Eds.), Habits of being (Vol. 2). Minneapolis, MN: University of Minnesota Press 2012.

Abstract **The automation of taste: anthropological effects of Shazam and another apps used as search engines in the everyday life**

The automation of taste: the socioemotional impact of Shazam and another apps used as search engines on the everyday life This paper focuses on Shazam, a commercial mobile phone based music identification service, available with several smartphones (Android, IPhone ecc.). The aim of this work is to describe the implications of the deepest penetration of new communicative devices in the everyday life. This process is not just based on the miniaturization of technologies and the power of immaterial world. If it is true that the software today is able to reshape every object and process of our life (Manovich 2008) then it is more useful to reflect not just on what people are doing with technologies, but on what technological gadgets are doing with us (Lanier 2010). The category of taste (Bourdieu 1984) since its original formulation it is an intersection between the economic, social and cultural capitals. Today this category puts the role of technology on a higher position in relation to other dimensions. Therefore, it is not exaggerated to admit that contemporary taste is completely crossed and redefined by new technologies. In this scenario, Shazam is not just a search engine of music contents played in our life as a part of the cultural environment that we experience everyday. It is also one of the clearest moment of overwhelming of the so called “digital dualism” (Jurgenson 2011), based on the idea that the virtual world and the real one are parts of two different ontological dimensions. Shazam is not only a research engine able to recognize what kind recorded track is played in a private or public environment. It is also a process of self-education that guides the user to create a personal taste and adopt it as a significative part his social experience. If in the past someone must be part of a social class and/or of a subculture through a pedagogic process

of “bildung”, today this social mediation is less important and it is almost completely replaceable by applications available on our smartphones. This is not just turning users in servomechanisms of the new devices. It is penetrating into the deepest part of our social identities, reshaping them in the perspective of a social hyper-expressivity (Keen 2012), more and more valorized as an important part of the contemporary self-branding strategies (Barile 2012).

References: Barile, N. (2012). The Age of Personal Web TVs. A Cultural Analysis of the Convergence between Web 2.0, Branding and Everyday Life. In A. Abruzzese, N. Barile, J. Gebhardt, J. Vincent, & L. Fortunati (Eds.), The New Television Ecosystem (pp. 41-60). Berlin: Peter Lang. Bourdieu, P., Distinction: a Social Critique of the Judgment of Taste, trans. Richard Nice, 1984. Jurgenson, N. (2011). Digital Dualism and the Fallacy of Web Objectivity. Retrieved from http://thesocietypages.org/cyborgology/2011/09/13/digital-dualism-and-the-fallacy-of-web-objectivity/ (accessed on 13 September 2011). Keen, A. (2012), Digital Vertigo How Today's Online Social Revolution Is Dividing, Diminishing, and Disorienting Us. Andrew Keen St. Martin's Press Hardcover Lanier, J., You Are Not a Gadget: A Manifesto,[New York : Alfred A. Knopf, 2010 Manovich, L. (2008). Software Takes Command. Released under CC license.

Maria Bakardjieva
Working Group Chair
Sessions V (13 June)

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Biography Maria Bakardjieva is Professor in the Department of Communication and Culture, University of Calgary, Canada. She is the author of Internet Society: The Internet in Everyday Life (2005, Sage) and co-editor of How Canadians Communicate (2004 and 2007, University of Calgary Press). Currently, Maria is the editor-in-chief of the Journal of Computer-Mediated Communication. Her research has examined Internet use practices across different social and cultural context with a focus on the ways in which users understand and actively appropriate new media. Her work on the topics of Internet use in everyday life, online community, e-learning and research ethics has been published in numerous international journals and edited collections. Her current projects look at the interactions between traditional and new media with a view to identifying opportunities for citizen participation in the public sphere.

Abstract **This Bot Hurt my Feelings: Ethics and Politics for Social Bots**

As individuals amass friends, update status and ‘groom’ relationships on social media sites, the labour of socializing and maintaining networks gradually becomes too much to bear. A typical human response to unbearable labour throughout history has been first mechanization, and consequently – automation. The mechanization stage on Web 2.0 has arrived in the form of simple one-click responses, recorded phrases, like and dislike icons. While we are employing social machines like this, the individual operator still has to exert the effort to select, to navigate, to click, or put together a three-syllable tweet. The next stage is just around the corner. Some say it is already here. The automation of social communication promises relief from the burden of reading our friends’ posts or spending time in our day to maintain web presence. Social bots offer to do it for us. When sociality is based on simple reactions and quantification, robots come to offer a logical solution. The more our human friends behave like robots, the more likely are robots to displace our human friends. If we do not know that all the support or approval we have received for our posts online has come from automated agents, we might feel happy and comfortable just as well. With automated sociability looming on the horizon, the issues of integrity, deceit, betrayal, confidentiality breach, and a whole host of other ethical standards applying to relationships between people are going to arise with regard to social bots. Ethics is closely followed by politics. When social bots start signing petitions, voting in online referenda, following politicians’ tweets, posting in political forums, etc., the online representation of political life could be severely distorted. This presentation will reflect on what all these possibilities mean for the design of social bots and what the place of ethics and politics should be in the process.

Alessandro Saffiotti

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Biography Alessandro Saffiotti is full professor of Computer Science at the University of Orebro, Sweden, where he heads the AASS Cognitive Robotic Systems laboratory. He holds a MSc in Computer Science from the University of Pisa, Italy, and a PhD in Applied Science from the Universite Libre de Bruxelles, Belgium. His research interests encompass artificial intelligence, autonomous robotics, and technology for elderly people. He is the inventor of the notion of "Ecology of physically embedded intelligent systems", a new approach to include robotic technologies in everyday life. This approach is currently applied to the domain of elderly assistance in the EU project Robot-Era. He has published more than 140 papers in international journals and conferences, and organized many international events. In 2005 he was a program chair of IJCAI, the premier conference on Artificial Intelligence. He is involved in four EU FP7 projects, in several EU networks, and in many national projects.

Abstract **Toward a human-robots-environment ecosystem: opportunities and challenges**

In response to the current demographic changes, the field of robotics is putting a growing emphasis on the development of robotic technologies suitable to provide assistance to elderly people, and to improve their independence and quality of life. Many of the current efforts in assistive robotics concentrate on the development of powerful robotic devices able to perform domestic chores or domestic assistive tasks, often mimiking the peformance of a human assistance. In this presentation, I argue that a redirection of this effort is needed in three aspects. First, to put a stronger attention on the service level, that is, the identification of the services which would really make robots added value devices. Second, to replace the vision of a powerful, autonomous single-robot device should be replaced by an ecosystem of robotic devices, where devices can be dynamically added and removed, and can cooperate to collectively produce the required services. Third, to extend this vision beyond the domestic boundaries, to create an ecosystem of robotic devices pervasively distributed in the houses, shops, streets and public places. This ecosystem should provide everywhere assistance to the senior citizens at all levels, from the homes to the town. The above perspective will be illustrated in the context of the Robot-Era EU project. I will discuss the Robot-Era concept, its user-centered development approach, and some of the interesting technical challenges and solutions which are being developed in that framework.

António Brandão Moniz

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Biography Professor at Universidade Nova Lisboa, Portugal, coordinator of the PhD programme on Technology Assessment, and invited researcher at Karlsruhe Institute of Technology, Germany. He is Portuguese representative at the TC9 “Computers and Society” of International Federation of Information Processing, since 2006. Coordinated recently the following scientific research projects: a) IR@MI - Social implications of robotics in manufacturing industry (KIT-ITAS), KIT start-up project within the joint framework “Antropomatics & Robotics” and “Humans and Work”, 2012; b) I3RS - Intuitive interaction between humans and industrial robot systems – a contribution to a conceptual approach (KIT-ITAS), KIT start-up project within the framework “Humans and Work”, 2012. Is coordinating the international network on social aspects of industrial robotics

Abstract **Intuitive interaction between humans and robots in industrial environments: the social robotics role**

Starting from the ‘intuitive interaction with technology’ (robotic systems) conceptualisation we pretend to discuss applications on industrial environments using the social robotics approach. The social dimension of worker-robot interaction in industry is becoming a decisive aspect of robotics development. Many problems and difficulties of robotics research are not only related to technical issues but framed by social aspects. Human-robot interaction (HRI) as a specific research field of robotics tackles this issue. One of the aims is to identify relevant research questions about the possibility of development of safer robot systems in closer human-machine intuitive interaction systems at the manufacturing shop-floor level. We try to contribute to minimize the cognitive and perceptual workload for robot operators in complex working systems. That can be highly relevant when different robots with different roles and different designs are to be used in the manufacturing industry to a larger extent. It is also necessary to investigate the transferability of results from industrial environments to other fields where the introduction of robotics is planned (health care, agriculture, mining, underwater, logistics, space operations, inspection, disaster management, medicine, etc.). The study of robotic applications and their social implications provided clear evidence of this transferability. The main research questions are usually related to industrial applications. But it has become clear that many research findings are of interest to many other types of applications, especially in those where social robotics can play an increase role. The social sciences approach to such technology assessment is of high relevance to understand the dimension of the intuitive interaction concept with social robotics.

Maria Koutsombogera

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Biography: Maria Koutsombogera (2012, Ph.D. in computational linguistics, University of Athens) is a scientific associate at the Institute for Language and Speech Processing in Athens, Greece. She has participated in several European and national R&D projects and networks in the fields of Natural Language Processing and Multimodal Communication. Her research interests lie in the description and modelling of human interactional behavior and in multimodal analytics. Her work has concentrated on the development and processing of multimodal resources for the description, analysis and interpretation of the multimodal human conversational behaviour, including cross-cultural studies.

Abstract

Developing resources of social interactions

Social robots require the capabilities of perceiving and expressing emotions, interacting in a natural manner, aligning themselves to their interlocutor, and make use of non-verbal cues to establish social relationships by taking human social norms into consideration. An essential aspect of modeling social behavior and make it as natural as possible as well as appropriate in a situational context, is a deep and multidimensional analysis and modelling of human-human and human-robot interaction. The related research forms an interdisciplinary field spanning computer vision, paralinguistics, machine learning, social psychology and linguistics. A common denominator of the above disciplines is the need of resources, i.e. datasets and tools which are the basis of describing and analyzing the features of interest, training algorithms, interpreting, modeling and generating social interactional behavior. The implementation of social robots is linked to the study and the modelling of social attitudes. At the same time, real-life applications such as social robots require realistic data to ensure naturalness. Thus, the development of datasets of spontaneous interaction enriched with annotations of features of this kind and used for experimentation purposes should be of primary importance. Providing realistic data involves subtle emotions or social attitudes that are not often taken into consideration by emotion recognition technologies. This applies to emotional states such as engagement, interest, annoyance, tiredness, pain, i.e. a wide spectrum of behavioural conditions to which a social robot could respond. In this sense, the realistic dimension in the data production cycle is related to naturally induced emotions instead of acted ones, occurring in as natural as possible settings. Spontaneous interaction usually entails the production of authentic emotional states, often linked to causal and temporal relations within the situation they are expressed. The attested shortage of the desirable annotated data is mostly due to the fact that they are time consuming in their development,

require large number of annotators, they lack standardisation and they sometimes are subject to IPR implications due to privacy issues related to their content. Thus, data production should be built in the most possible standardised way (i.e. mark-up languages, evaluation protocols, etc.) to ensure the reusability of datasets as well as to pursue interoperability that maximizes the possibility of being compatible and integratable at various levels. Moreover, to establish availability, data providers should ensure that data reuse is permitted by applying a set of licensing conditions which may vary from open to restricted, free or for a small fee. As an alternative to typical processes of data production, one could consider targeting the large volumes of online videos from e.g. video-sharing websites and social media, as a source of real-life scenarios, provided that they are cleared of IPR issues. Social interaction with robots entails communication within the social context that the interaction is shaped and attachment to the social standards and norms that the role of the robot represents. In that sense, social robots are culturally dependent and culture traits, especially when it comes to social attitudes, should be taken into account. Cooperation among disciplines (engineers, psychologists, linguists) should be continuously pursued, as it can prove beneficial as regards the complementarity of the distinct expertise in resources development and processing. The abundance of appropriate realistic data, together with machine learning techniques directed to modelling could approach the challenging issue of automatically detect social states, to help identifying the appropriate cues and to build engaging, reliable, inspiring social robots servicing humans, accompanying them, entertaining them, safeguarding them.

Costanza Navarretta

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Biography Costanza Navarretta is a senior researcher at the Centre for Language Technology (CST), University of Copenhagen. She got her Ph.D. in Computational Linguistics at University of Copenhagen in 2002; she is Master in Computer Science from University of Copenhagen and in Scandinavian Languages from "La Sapienza" in Rome. She researches and teaches in multimodal communication, multimodal corpora, anaphora resolution, cognitive science, and application of machine learning to multimodal data (VKK, NOMCO, CLARIN-DK, CLARA, DAD projects). She has participated in Danish, Nordic and European projects in various research areas comprising corpus linguistics, grammar formalisation, computational lexical resources design and evaluation, knowledge bases. She has published refereed articles alone and with other researchers in all the above mentioned research areas and has presented her research in numerous national and international conferences and workshops.

Abstract

The annotation and use of multimodal corpora for modelling believable social robots

When humans communicate, they use the whole body, both as speakers and listeners: human communication is naturally multimodal involving verbal and non-verbal behaviours comprising head movements, facial expressions, body postures, arm and hand gestures as well as the emotions and affective states which they express. Communicative multimodal behaviours depend on many aspects comprising the cultural environment, the communicative situation, the number and role of the participants, their relation and age. Social robots which interact with users of various types, cultural background and needs in order to assist them in different tasks and situations must show plausible behaviours and be able to identify the users' multimodal behaviours to act adequately. Identifying and modelling the relation between multimodal behaviours and communicative situation, cultural, physical and social settings requires formally annotated multimodal corpora (video-recorded conversations) of different types. But the collection and formal annotation of these are not trivial tasks.. This presentation addresses the collection, annotation, evaluation and use of multimodal corpora for modelling and testing social plausible agents and discusses problems and future challenges related to data collection and annotation. The research field is computational linguistics. I start presenting cooperative work in Danish, Nordic and European networks and projects (MUMIN, CLARIN-DK, VKK, NOMCO, CLARA), then, I discuss challenges and problems to be addressed in the future. 1. The framework A formal model for annotating particular communicative functions of multimodal behaviours in video recorded conversations was defined in the Nordic

network MUMIN. The resulting model (Allwood et al. 2007) describes the shape and the communicative functions of body behaviours through pre-defined features. Body behaviours are multi-functional and are categorised according to Peirce's semiotic types. Body behaviours can be connected to speech tokens (the speaker and/or the interlocutors' speech) if the annotators judge that they are semantically related, and they can be added affective state annotations. In the Danish annotations, we combine the MUMIN open-ended emotion list with Pleasure, Arousal and Dominance values inspired by Kipp & Martin (2009). The interactive communicative functions of feedback and turn management as well as own communication management functions were addressed. 2. The data Differing from multimodal corpora of scenario-based or acted data, such as AMI and CALLAS, we mostly work with naturally occurring conversations. The MOVIN/CLARIN-DK corpus consists of dyadic and triadic conversation at private homes between people who are familiar with each other. Polish comparable data are available. The NOMCO first encounters are dyadic conversations between young people who meet for the first time. It was recorded in a studio with the same settings as the comparable Swedish and Finnish NOMCO corpora. The participants are young people talking freely while getting acquainted. In the Danish corpora, speech is transcribed and aligned at the word level and multimodal behaviours (head movements, facial expressions, body postures and hand gestures) and their functions are described following the MUMIN scheme. Emotions shown by facial expressions have also been coded. Danish TV interviews, Danish map task data and British and American political debates have also been coded with part of these annotations. The annotation procedure was the following: a coder annotated and a second coder corrected the annotations; disagreement was resolved by a third coder. Inter-coder agreement tests on head and facial expressions gave kappa scores (Cohen's kappa) between 0.7 and 0.91 depending on the class (combined results for segmentation and classification). Inter-coder agreement tests on 27 emotion labels resulted in a kappa score of 0.61 while scores between 0.7 and 0.84 were obtained on PAD values. 3. The analysis The data show that all types of body movements are involved in feedback and turn management in Danish, and that emotions are both related to the communicative situation and to the behaviour's communicative functions. Comparative analysis of two Danish corpora shows that familiarity degree of participants as well as physical setting and number of participants influence feedback behaviours. Multilingual comparative studies indicate that there are similarities but also differences in the way multimodal feedback is provided in Danish and Polish comparable data. The same is true in Nordic corpora. This is remarkable given that the Danish, Swedish and Finnish cultures are considered to be similar and Danish and Swedish are very near linguistically. Thus, our studies confirm that both the culture and the communicative situation must be taken into account when modelling multimodal behaviours. 4. The use The annotations in our corpora have been used to train machine learning algorithms in order to inter alia: a) identify the semantics of feedback "yes" and "no" expressions (such as "agreement", "backchannel-signal" , "answer to yes/no question" , "repetition", "rephrase", "turn-elicit") from head movement and prosodic annotations; b) predict the functions of head movements and facial expressions from their shape and co-speech; c) predict the gesturer from the body behaviours' shape; d) using hand gestures' form to

automatically cluster co-referring expressions. The results of all experiments indicate that the data annotated following the MUMIN scheme can be used for training classifiers to identify and predict body behaviours with various communicative functions. The results are promising given the coarse grained shape features annotated and the limited size of the data. 5. Problems and challenges Even though the approach we have followed is promising, we face the challenge of extending the work to more types of interaction, cultural and communicative environment. However the collection, annotation and distribution of multimodal corpora are difficult. First of all, recording everyday conversations involving participants of various types and then sharing the data involve solving privacy and copyright issues which should be done at a political level and not in the single research projects. Secondarily, the quality (picture and sound) of recordings of naturally occurring conversations in natural settings is seldom good enough for applying to them tools such as identifiers of body behaviours. Thus, researchers have to manually segment these behaviours before they can interpret and classify them. This is not very resource and time consuming (in our case approx. 2 hours for the annotation of a person's body behaviour per minute), and can be imprecise. Since providing data for modelling plausible communicative behaviours is expensive, the work should be focused on particularly important areas in cooperation between researchers in computational multimodal communication and other researchers involved in the development of social robots, and efforts should be done to facilitate the collection, annotation and sharing of the data. Acknowledgements: The described work is cooperative. Some of the principal involved researchers are P. Paggio, E. Ahlsén, J. Allwood and K. Jokinen.

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COST (European Cooperation in Science and Technology) is Europe's longest-running intergovernmental framework for cooperation in science and technology funding cooperative scientific projects called 'COST Actions'. With a successful history of implementing scientific networking projects for over 40 years, COST offers scientists the opportunity to embark upon bottom-up, multidisciplinary and collaborative networks across all science and technology domains. Beyond the EU-27 member states, COST countries include Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Iceland, Norway, Serbia, Switzerland and Turkey. Israel is a cooperating state. Beyond the European borders, COST opens the European Research Area (ERA) to cooperation with non-European countries on the basis of mutual benefit.

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