

Interacting with Robots and Virtual Agents?

Robotic Systems in Situated Action and Social Encounters

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ABSTRACT OF WORKSHOP

Research in informatics and the engineering sciences strives to endow technical systems – like (humanoid) robots, embodied conversational agents, voice interfaces etc. – with abilities that should allow the systems to “interact with people in a natural, interpersonal manner” (Breazeal et al. 2016: 1935). While the evaluation of such technologies has a strong tradition in the fields of psychology and cognitive sciences investigating the robot’s/ agent’s usability and the users’ perception and attitudes using questionnaires and quantitative measures, it remains unclear as to how these results are related to the concrete interactional conduct of the robot/agent, how users spontaneously attempt to deal with such technologies, which resources they mobilize to coordinate their actions with those of the robot/agent, and how the artefact and its agency are constructed. This workshop aims at addressing these open questions by suggesting an *interactional* and *praxeological* approach based on the micro-analysis of video-taped recordings of encounters between humans and robots and a research methodology based on Ethnography and Conversation Analysis. It brings together researchers from the humanities and social sciences who investigate the ways in which robotic systems feature in situated action and social encounters ‘in the wild’.

CCS CONCEPTS

• Human-Computer-Interaction • Collaborative Interaction • Empirical Studies in HCI • Robotics • Artificial Intelligence • Cooperation and coordination • Discourse, dialogue and pragmatics

KEYWORDS

Social Robotics, Human-Robot-Interaction, Conversational Agents, Situated Action, Social Settings, Intelligent Personal Assistants, Conversation Analysis, Ethnomethodology

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1 Towards an Interactional and Praxeological Approach on Human-Robot/Agent-Interaction

Research in informatics and the engineering sciences strives to endow technical systems – like (humanoid) robots, embodied conversational agents, voice interfaces etc. – with abilities that should provide intuitive access for lay-users based on their everyday communicational practices. To engage with users, such technical systems use talk, embodied conduct and/or movement in space and, at the same time, observe their environment with different sensors to detect users and make sense of their interactional conduct. This way, robotic systems should – such is the goal in the field of Social Robotics and its application to human-robot- (HRI) or human-agent-interaction (HAI) – be able to “interact with people in a natural, interpersonal manner” (Breazeal et al. 2016: 1935).

Over the last couple of years, such robotic technologies have matured considerably with regard to their interactional competences and degrees of autonomy: Guide robots explain exhibits in museums engaging visitors in quizzes or attempt to react when they sense confusion about the designated exhibit (Yamazaki et al. 2008, 2013, Pitsch et al. 2016), speech assistants like Google’s Alexa help with online shopping or manage the user’s appointments (Reeves & Porcheron 2018, Opfermann et al. 2017); and autonomous wheelchairs try to adjust and coordinate their movements with those of accompanying pedestrians (Fukuda et al. 2018). Some of these technologies have begun to enter into the users’ homes while others are explored as research prototypes in studies conducted both in the lab or ‘in the wild’.

The evaluation of such technologies has, on the one hand, a strong tradition in the fields of psychology and cognitive sciences investigating the robot’s/agent’s usability and the users’ perception of and attitudes towards the technology using as method predominantly questionnaires and quantitative measures. Whilst such approaches can deal with large numbers of participants, it remains often unclear as to how these results are related to the concrete interactional conduct of the robot/agent. What is more, the users’ spontaneous ways of dealing with such technologies, their sense-making practices and ways of constructing the artefact and its agency, as well as their attempts and resources mobilized to coordinate their actions with those of the robot/agent remain largely hidden. An

interactional and *praxeological* approach, on the other hand, is able to shed light on the situated nature of human-robot/agent-interaction and the participants' communicative conduct and their micro-practices of interactional coordination (e.g. Pitsch et al. 2013, Pitsch 2016, Krummheuer 2016, Yamazaki et al. 2013, Alac 2016, Porcheron et al. 2018). It uses video-taped recordings of encounters between humans and 'sociable robots' (Breazeal) and a research methodology based on Ethnography, Conversation Analysis and related approaches. While such a perspective has a strong tradition in research on 'Interaction & Technology' in the area of Workplace Studies and CSCW (Heath & Luff 2000, Suchman 1987), it begins to also provide fruitful insights into the encounters of humans and robots.

Therefore, in this panel, we aim at bringing together researchers from the humanities and social sciences who are active in this emerging discipline of human-robot/agent-interaction to discuss current empirical work, and methodological and conceptual issues. Questions to be addressed relate to the following areas:

1. How could our conceptual and empirical knowledge about the verbal and embodied communicative practices in situated interaction might be useful for advancing the design of such technologies?
2. How do users and developers engage with robotic systems and define the nature of the ensuing encounters as social, technical, or as yet-to-be-defined new types of interaction?
3. How can we conceptualize the emerging constellations of humans and technical systems in the light of novel forms of agency and autonomy?
4. How are such robotic technologies integrated by users into their everyday practices and how might this eventually change the nature of social interactions and the ecology of their everyday lives?

To situate this workshop at the "Mensch und Computer"/"Human and Computer"-conference allows to both bring together researchers from the humanities and social sciences and, at the same time, to respect the interdisciplinary nature of the field of study.

2 Participants

B. Due (University of Copenhagen): Laughing at the robot. Incongruent robot actions as laughables

A. Krummheuer, M. Rehm, K. Rodil (Aalborg University): Doing Scheduling? The Construction of Agency and Memory while Programming a Reminder Robot with a Person with Severe Brain Injury

F. Muhle & I. Bock (Bielefeld University): Intuitive Interfaces? Interface Design and its Impact on Human-Robot-Interaction

H. Pelikan (Linköping University): "A Stubborn Child". How Robot Sounds are Oriented to in Everyday Situated Interaction at Home

K. Pitsch (University of Duisburg-Essen): Referential Practices. Human-Robot-Interaction as Methodological Tool to Investigate Multimodal Interaction

S. Reeves, J. Fischer, M. Porcheron, R. Sikveland (University of Nottingham & Loughborough University): Learning how to talk. Co-producing action with and around voice agents

M. Relieu, M. Sahin, A. Francillion (Telecom Paris, SAP Research & Eurecom): *Lenny the bot* as a resource for sequential analysis. Exploring the treatment of Next Turn Repair Initiation in the beginnings of unsolicited calls

N. Rollet & C. Licoppe (Télécom ParisTech): Why (pre)closings matter. The case of human-robot interaction

J. Velkovska (Orange Labs): When an emotional robot meets real customers. Exploring HRI in a customer relationship setting

A. Yamazaki, K. Yamazaki, Y. Arano, E. Iiyama, H. Fukuda, Y. Kobayashi, Y. Kuno (Saitama University & Tokyo University of Technology): Interacting with a Wheelchair Mounted Navigator Robot

REFERENCES

- [1] Alac, M. (2016). Social robots: Things or agents? *AI & SOCIETY*, 31(4), 519-535.
- [2] Breazeal, C., Dautenhahn, K., & Kanda, T. (2016). Social Robotics. In B. Siciliano & O. Khatib (Eds.), *Springer Handbook of Robotics* (pp. 1935-1971).
- [3] Heath, C., & Luff, P. (2000). *Technology in Action*. Cambridge/UK.
- [4] Krummheuer, A. (2016). Who Am I? What Are You? Identity Construction in Encounters Between a Teleoperated Robot and People with Acquired Brain Injury. *ICSR 2016*, Kansas City, 880-889.
- [5] Muhle, F. (2018). Begegnungen mit Nadine. Probleme der ‚Interaktion‘ mit einem humanoiden Roboter. In A. Pofert & M. Pfadenhauer (Eds.), *Wissensrelationen*. (pp. 499-511). Weinheim.
- [6] Opfermann, C., Pitsch, K., Yaghouzadeh, R., & Kopp, S. (2017). The Communicative Activity of 'Making Suggestions' as an Interactional Process. Towards a Dialog Model for HAI. *HAI 2017*, Bielefeld, 161-170.
- [7] Pitsch, K. (2016). Limits and Opportunities for Mathematizing Communicational Conduct for Social Robotics in the Real-World? - Towards enabling a Robot to make use of the Human's Competences. *AI & Society*, 31(4), 587-593.
- [8] Pitsch, K., Vollmer, A.-L., & Mühlhig, M. (2013). Robot feedback shapes the tutor's presentation. How a robot's online gaze strategies lead to micro-adaptation of the human's conduct. *Interaction Studies*, 14(2), 268-296.
- [9] Pitsch, K., Dankert, T., Gehle, R., & Wrede, S. (2016). Referential practices. Effects of a museum guide robot suggesting a deictic 'repair' action to visitors attempting to orient to an exhibit. *Ro-Man 2016*, New York, 225-231.
- [10] Porcheron, M., Fischer, J. E., Reeves, S., & Sharples, S. (2018). Voice Interfaces in Everyday Life. *CHI 2018*, Montréal, QC, Canada, Paper 640.
- [11] Suchman, L. (1987). *Plans and Situated Actions. The problem of human machine communication*. Cambridge: Cambridge University Press.
- [12] Yamazaki, A., Yamazaki, K., Kuno, Y., Burdelski, M., Kawashima, M., & Kuzuoka, H. (2008). Precision Timing in Human-Robot Interaction: Coordination of Head Movement and Utterance. *CHI 2008*, Florence/Italy, 131-139.
- [13] Yamazaki, A., Yamazaki, K., Ikeda, K., Burdelski, M., Fukushima, M., Suzuki, T., Krihara, M., Kuno, Y., Kobayashi, Y. (2013). Interactions between a quiz robot and multiple participants: Focusing on speech, gaze and bodily conduct in Japanese and English speakers. *Interaction Studies*, 14(3), 366-389.
- [14] Fukuda, H., Yamazaki, K., Yamazaki, A., Saito, Y., Iiyama, E., Yamazaki, S., Kobayashi, Y., Kuno, Y., Ikeda, K. (2018). Enhancing Multiparty Cooperative Movements. A Robotic Wheelchair that Assists in Predicting Next Actions. *ICMI 2018*, Boulder, 409-417.