Dialogue & Discourse
Special Issue on Embodied Conversational Systems in Human-Robot Interaction

Call for Papers

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Topic Area

Conversational systems such as chatbots and virtual assistants have become increasingly popular in recent years. This technology has the potential to enhance Human-Robot Interaction (HRI) and improve the user experience. However, there are significant challenges in designing and implementing effective conversational systems for HRI that need to be addressed (cf. Devillers et al. 2020; Lison & Kennington 2023). This special issue aims to bring together researchers and practitioners to explore the opportunities and challenges in developing conversational systems for human-robot interaction.

Conversational systems are an important component of human-robot interaction because they enable more natural and intuitive communication between humans and robots. By leveraging research in areas such as dialogue systems, natural language understanding, natural language generation and multi-modal interaction, robots can become more accessible, usable, and engaging. Conversational systems can enable robots to better understand and respond to human emotions and social cues. By analysing speech patterns, facial expressions, and other nonverbal cues, conversational systems can help robots to better understand human emotions and tailor their responses accordingly. This can help to create more engaging and satisfying interactions between humans and robots, which is important for applications such as healthcare, education, and entertainment. Conversational systems can also help to personalise interactions between humans and robots, by adapting to the individual needs, preferences, and characteristics of each user, and creating more tailored interactions that are more likely to achieve meaningful interactions. This can be particularly important in applications such as personalised tutoring, and coaching, where the effectiveness of the interaction depends on the ability of the system to adapt to the individual needs of each user. Conversational systems offer a way to achieve this by enabling natural language interaction, which is a more intuitive and familiar way for humans to communicate.

Human-Robot Interaction is a complex and multidisciplinary field that requires expertise from multiple domains, including robotics, artificial intelligence, psychology, and human factors. Conversational systems bring together many of these domains and represent a challenging and rewarding area of research that can help advance the state of the art in HRI. Conversational systems for HRI have the potential to transform many areas of society, including healthcare, education and entertainment.

Conversational systems can make robots more engaging, usable, and effective in these domains, leading to improved outcomes and quality of life for individuals and society as a whole.

The aim of this special issue is to bring together novel research work in the area of dialogue systems that are designed to enhance/support Human-Robot Interaction (HRI). In the active research area of HRI, the primary goal is to develop robotic agents that exhibit socially intelligent behaviour when interacting with human partners. Despite the clear relationship between social intelligence and fluent, flexible linguistic interaction, in practice interactive robots have only recently begun to use anything beyond a simple dialogue manager and template-based response generation process. This means that robot systems cannot take advantage of the flexibility offered by dialogue systems and NLG when managing conversations between humans and robots in dynamic environments, or when the conversation needs to be adapted in different contexts or multiple target languages.

This special issue aims to provide a forum for researchers and practitioners to share their latest research results, exchange ideas, and discuss the opportunities and challenges in developing conversational systems for human-robot interaction. We hope that this special issue will help to advance the state of the art in the field and inspire further research and development in this exciting area.

Topics of interest:

- Design and evaluation of conversational systems for human-robot interaction
- Natural language understanding and generation for human-robot interaction
- Situated dialogue with robots
- Contextualization and personalization in conversational systems
- Emotional and social intelligence in conversational systems
- Multimodal interaction and fusion of sensory data in conversational systems
- Ethics, privacy, and security issues in conversational systems for human-robot interaction
- User studies and user experience evaluation of conversational systems for human-robot interaction
- Applications of conversational systems in healthcare, education, and entertainment

We invite papers presenting **original** work, as well as survey papers or substantial opinion papers. All submissions will be peer-reviewed according to the journal's standard guidelines. Manuscripts should be submitted online via the journal's website, following the journal's formatting guidelines.

Relevant references

Laurence Devillers, Tatsuya Kawahara, Roger K. Moore, and Matthias Scheutz (2020). Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction (Dagstuhl Seminar 20021). In *Dagstuhl Reports*, Volume 10, Issue 1, pp. 1-51, Schloss Dagstuhl – Leibniz-Zentrum für Informatik.

Pierre Lison & Casey Kennington(2023). Who's in Charge? Roles and Responsibilities of Decision-Making Components in Conversational Robots. In: *HRI 2023 Workshop on Human-Robot Conversational Interaction.* http://arxiv.org/abs/2303.08470

Kristiina Jokinen. 2022. Conversational Agents and Robot Interaction. In *HCI International 2022 - Late Breaking Papers. Multimodality in Advanced Interaction Environments: 24th International Conference on Human-Computer Interaction, HCII 2022*, Virtual Event, June 26 – July 1, 2022, Proceedings. Springer-Verlag, Berlin, Heidelberg, 280–292. https://doi.org/10.1007/978-3-031-17618-0_21

Mary Ellen Foster. 2019. Natural language generation for social robotics: opportunities and challenges. Philosophical Transactions of the Royal Society B, 2019

Dimosthenis Kontogiorgos, Andre Pereira, Boran Sahindal, Sanne van Waveren, Joakim Gustafson. 2020. Behavioural Responses to Robot Conversational Failures. In *Proceedings of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20)*, March 23–26, 2020, Cambridge, United Kingdom. ACM, New York, NY, USA, 10 pages. https://doi.org/10.1145/3319502.3374782

Gabriel Skantze, Turn-taking in Conversational Systems and Human-Robot Interaction: A Review, *Computer Speech & Language,* Volume 67, 2021, 101178 https://doi.org/10.1016/j.csl.2020.101178.

Timetable

Deadline: 1 October 2023
Allocation of Reviewers: 2–15 October 2023
Reviewing period: 15 September–15 December 2023
Check of reviews/chase up reviews: 15–20 January 2024
First Decisions: 30 January 2024
Resubmissions: 1 March 2024
Re-reviews deadline: 1 April 2024
Final decisions: 15 April 2024
Camera ready: 15 May 2024