

Collaborating with Intelligent Systems : Machines as Teammates

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Artificial Intelligence (AI)-enabled products and services for more non-routine work tasks become more and more prevalent in our daily work. The work tasks that are augmented or automated are not anymore only mechanical and operational in nature (e.g., production forecasting, assembling cars, data transfer), but cover more and more information and knowledge management tasks (e.g., facilitation of teams, augmenting problem-solving). With this development, we believe that the type of AI-support also becomes more conversational and team-based. Particularly the COVID-19 pandemic, and accompanying this, the need for physical distancing and moving interactions online, fueled the use of conversational AI (e.g., chatbots, voice assistants, social robots) (Miller, 2021). Big tech vendors such as Microsoft, Amazon, or Google provide powerful cloud-based developing environments for such AI-enabled conversational agents (CA). They enable businesses to develop AI-based CAs with minimal up-front investment into the technological infrastructure (e.g., servers, databases), while having access to generic, but powerful AI language models (e.g., Luis, Watson Assistant, Dialogflow, AmazonLex) or no-code/minimal-code development environments (e.g., Bot Framework Composer, TensorFlow). In this context, the GoogleScholar slogan “*stand on the shoulders of giants*” is all too applicable and underscores the potential benefit that organizations hope to gather from leveraging the already available infrastructure to implement a CA to automate customer or employee interactions.

However, the real world also shows that the AI hype, of which AI-enabled CAs represent a rather small phenomenon, faces a lot of uproar and uncertainty. As with other aspects of our daily lives, extreme positions towards AI are commonplace and remind us of the Dowd (2017) Vanity Fair article on how thought leaders (e.g., Stephen Hawking, Elon Musk, unfortunately no woman to mention among the 15 people) evaluate the current development of AI. Particularly the fear among the public seems to be on a constant rise. A 2019 survey by the Oxford University Center for the Governance of AI found that 34% of the respondents believe that AI in terms of high-level machine intelligence will have a negative

impact on humanity, emphasizing the fear that exists in society (Zhang & Dafoe, 2019). This number should be considered against the backdrop that the same study also found that a majority of people lack certain AI literacy and are for example not aware that Google Translate, Facebook Photo Tagging, or Netflix recommendations all rely on AI (Zhang & Dafoe, 2019). Meanwhile countries and state unions, such as the European Union are working on data privacy regulations and ethical guidelines. For example, according to Article 22 of the GDPR a person “shall have the right [to] not be subject to a decision based solely on automated processing, including profiling” (GDPRhub, 2022).

This shows that AI-enabled CAs can provide a lot of potential for businesses, their customers and employees. But, there exist also numerous challenges on the individual, organizational, and societal level that must be considered when we, as (Information Systems) researchers and research-oriented practitioners, want to explore and facilitate the successful collaboration between humans and intelligent systems.

This minitrack’s mission is to enable the dissemination of original research that can help advance understanding around how AI-enabled intelligent systems influence human-machine relationships and which consequences those human-machine collaborations have on individuals, organizations, and society. Specifically, our minitrack welcomed research in the areas of:

1. Human collaboration with artificial agents and intelligent systems in teams, crowds, and with individuals
2. Design and evaluation of smart technology as team members, including agent-based support (e.g., robots, chatbots) for decision-makers
3. Individual differences that impact collaboration with and acceptance of artificial intelligence
4. Algorithmic management in teams and crowds
5. Collaboration with agents in extended reality environments (e.g., virtual reality, augmented reality, mixed reality)

6. Usability and design research for human collaboration with automated teammates
7. Digitalization and automation of collaborative processes
8. Agent-based support for group facilitation, including innovative facilitation methods, techniques, patterns, and procedures to improve (a)synchronous collaboration between co-located and distributed people, teams, or groups
9. Studies and frameworks that examine trust in, satisfaction with, and expectations of artificial intelligence
10. Design features for automated teammates that improve human collaboration with them
11. Studies of group dynamics when an artificial teammate is on the team
12. Methods and technologies for eliciting and capturing tacit knowledge from experts (i.e., externalization) and sharing / incorporating that knowledge into collaborative efforts with automation

This year we received eight promising papers from which four are featured in our minitrack:

- *“It depends on the timing: The ripple effect of AI on team decision-making”* by Yan and Gürkan investigates the effect of timing interventions of an AI assistant for team performance using experimental methods.
- *“The Effect of AI Teammate Ethicality on Trust Outcomes and Individual Performance in Human-AI Teams”* by Schelble et al. reports on an experiment investigating trust and ethical expectations in human-AI teams.
- *“Towards the Design of Hybrid Intelligence Frontline Service Technologies – A Novel Human-in-the-Loop Configuration for Human-Machine Interactions”* by Li Mahei Manhei et al. This article adopted a design science approach and offers design knowledge on how an intelligent system can augment frontline service workers and provide human-in-the-loop touchpoints.
- *“Mechanisms of Common Ground in Human-Agent Interaction: A Systematic Review of Conversational Agent Research”* by Antonia Tolzin and Andreas Janson reports on a literature review investigating how to build “common ground” for more successful human-agent interaction.

We thank the authors for submitting their articles to our mini-track and for contributing to the discussions and advancement of collaborating with intelligent systems or even future machine teammates.

References

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