

## Collaboration with Automation: Machines as Teammates

Douglas C. Derrick  
University of Nebraska at  
Omaha  
[dcderrick@unomaha.edu](mailto:dcderrick@unomaha.edu)

Joel S. Elson  
University of Nebraska at  
Omaha  
[jselson@unomaha.edu](mailto:jselson@unomaha.edu)

Isabella Seeber  
University of Innsbruck  
[isabella.seeber@uibk.ac.at](mailto:isabella.seeber@uibk.ac.at)

Humans and machines are collaborating in new ways and organizations are increasingly leveraging human-automation teams. Siri (the Apple iPhone conversational assistant), Alexa (Amazon's conversational agent), physical robots, virtual customer-service agents, and many other pseudo-intelligent agents, use text clues, vocal cues, or other environmental sensors to retrieve information from the user, process it, and respond appropriately. These agents help individuals complete everyday tasks such as find directions, ask for help when ordering goods or services on a website, or understand additional information about a topic or idea. Humans still use automated agents for simple, utilitarian tasks, but these types of assistants are able to undertake larger and more important tasks.

While intelligent agents present a potential solution, it is not fully understood about how humans will actually interact with digitized experts or if humans utilize intelligent agents in ways different from traditional human-to-human collaboration. As intelligent systems advance and become more ubiquitous, we need to explore new dimensions of human-computer collaboration based on natural communication patterns and consideration of human individual differences.

This mini-track will examine the emergence of this new type of collaboration and its implications for individuals, teams, and organizations. It is focused at the intersection of human-machine collaboration. Specifically, this mini-track focuses on:

1. Theoretical foundations and design methodologies Human collaboration with artificial agents and intelligent decision support for teams and crowds
2. Design and evaluation of smart technology as team members including agent-based support for decision makers
3. Usability Engineering aspects for human collaboration with automated teammates
4. Automation of collaborative processes
5. 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

6. Individual differences that impact collaboration with and acceptance of automated agents
7. Studies and frameworks that examine trust in automated agents and its impact on collaboration with automation
8. Design features for automated teammates that improve human collaboration with them

This year, we have nine great papers that cover a variety of important topics. The first paper, "Exploring Automated Leadership and Agent Interaction Modalities", looks at if transactional leadership can be imbued into an artificial teammate. Second, "The Future of Human-AI Collaboration: A Taxonomy of Design Knowledge for Hybrid Intelligence Systems" presents a taxonomy these hybrid systems. Third, "Designing Automated Facilitation for Design Thinking: A Chatbot for Supporting Teams in the Empathy Map Method" looks at chatbot support for automated facilitation. The fourth paper, "The Effect of Stress on Reliance Decisions" puts forth an experiment that investigates stress and human-machine collaboration. The next two papers, "Trusting Robots in Teams: Examining the Impacts of Trusting Robots on Team Performance and Satisfaction" and "Understanding the Role of Trust in Human-Autonomy Teaming" examines trust in these new teams from different perspectives. The final three papers, "Symbiotic Co-Evolution in Collaborative Human-Machine Decision Making: Exploration of a Multi-Year Design Science Research Project in the Air Cargo Industry", "Towards a Technique for Modeling New Forms of Collaborative Work Practices – The Facilitation Process Model 2.0", and "Where is the Bot in our Team? Toward a Taxonomy of Design Option Combinations for Conversational Agents in Collaborative Work" are extended works that look at this collaboration phenomenon overtime and in various contexts.

We thank the authors for submitting their work to make this an engaging mini-track. We hope you enjoy the papers and their presentations at the conference and look forward to the collaboration and insights.