Assessing the Impact of AI-Agent Integration on Human-Human Collaboration in Mixed Reality

Proposal

Based at UniSA's Australian Research Centre for Interactive and Virtual Environments, as part of the CROSSING IRL, this project will build upon an existing project that was built to support human-human teaming. The proposed project aims to explore the integration of an autonomous agent into an existing collaborative task environment designed for human-human teaming. This environment, currently implemented using Microsoft HoloLens technology, measures team cohesion through a task that challenges participants to balance individual goals with team. Participants can focus on their personal scores, reward cooperative teammates, punish uncooperative ones, and develop strategies to maximize outcomes.

 The introduction of an autonomous agent into this system presents an opportunity to investigate its impact on team dynamics. This agent could be designed to either support and enhance team cohesion or act as an untrustworthy element, providing valuable insights into human-agent interaction. By examining how the presence and behaviour of the autonomous agent modifies group cohesion, the project aims to contribute significant findings to the field of human-computer interaction research. This study has the potential to shed light on the complexities of integrating AI agents into collaborative human environments and their effects on team performance and interpersonal dynamics.

 The project would require the successful candidate to learn both Unity and HoloLens/mixed reality development to get the previous project running, whilst defining both the requirements for the autonomous agent and how to develop and integrate that agent into the collaborative system.

Following successful development of the system, a user study will be conducted to evaluate the effectiveness of the agent in working alongside human operators with the aim of publishing the results to a top tier journal or conference. UniSA's BBB Research Centre also conducts overnight sleep studies, with the potential to incorporate the system into a sleep study to evaluate the impact of the system on fatigued users of varying levels.

Participants will spend time both at UniSA's IVE and BBB centres, as well as inside the CROSSING IRL.

Internship Opportunity

We are seeking a motivated candidate for an internship at UniSA's Australian Research Centre for Interactive and Virtual Environments, as part of the CROSSING IRL program. This opportunity offers a unique chance to contribute to cutting-edge research in human-autonomous agent teaming.

Project Overview

- Develop and integrate an autonomous agent into an existing collaborative task environment using Microsoft HoloLens technology

- The task environment challenges participants to balance individual goals with team cooperation

- Participants can focus on personal scores, reward cooperative teammates, or punish uncooperative ones

- Investigate how the autonomous agent impacts team dynamics and cohesion

- Design the agent to either support team cohesion or act as an untrustworthy element

- Conduct user studies to evaluate the effectiveness of the agent working alongside human operators

Required Skills

- Unity and HoloLens/mixed reality development (training provided)

- Strong interest in human-computer interaction and AI

- Analytical and problem-solving abilities

Additional Opportunities

- Potential involvement in sleep studies to examine AI impact on fatigued users

- Collaboration across multiple research centers: UniSA's IVE, BBB, and the CROSSING IRL

- Work with established researchers in the field

This internship offers a valuable opportunity to gain hands-on experience in an emerging field of study. Successful candidates will contribute to meaningful research with potential publication opportunities in top-tier journals or conferences.

We welcome applications from qualified individuals interested in advancing the field of human-autonomous agent teaming. Please submit your application to join our research team and contribute to this innovative project.

Contact

James Baumeister (James.Baumeister@unisa.edu.au)

Siobhan Banks (Siobhan.Banks@unisa.edu.au)

James Walsh (James.Walsh@unisa.edu.au)

Cédric Fleury (cedric.fleury@imt-atlantique.fr)