

OMIC R&D TECHNOLOGY BOARD

CONCEPTUAL ABSTRACT



TITLE: Developing Human-Robot Trust for Industrial Applications

RELATED ROAD-MAPPING DESIGNATION ID#: R28

SUPPORTIVE INDUSTRY: Cobot Team, Caron, Boeing

PROJECT TYPE: General Project

PROBLEM STATEMENT (What Are We Trying to Solve?): As modern robots move from carefully controlled factory floors to chaotic human-populated environments, a need arises for mutual understanding and trust between people and robots. Past robotics research has demonstrated that people can possess too much trust in a faulty robot. People have also been found to resist aid from automation. Both cases detract from the usefulness of new robotic technology, either by making it potentially unsafe (the former case) or prohibiting it from being useful (the latter case).

PROJECT DESCRIPTION: Recent robot expressivity research has sought to make robot intentions more apparent, but most of these expressive functions communicate unidirectionally from a robot to a nearby person. The addition of reciprocal communication design components and more profound rapport-building opportunities may help a robot more completely understand and collaborate with the humans around it. In their current state, robotic systems are unfamiliar and opaque to human users, and humans in a robot's workspace are often considered something to avoid rather than something to collaborate with. These philosophies need to change before optimal human-robot teaming can occur in intimate-proximity and high-risk tasks.

Identify Related OMIC R&D Resources: Proposing researchers should use their best judgment in deciding on the optimal resources for the research. To further aid in this decision, the OMIC staff has taken the initiative to best identify on-site resources (machines, equipment, and staff) that may relate to the scope of this research. Please recognize that researchers are not limited to these resources.

- Machines and equipment at OMIC can be reviewed at:
<https://www.omic.us/explore/facility>
- OMIC Staff or SMEs

PROJECT DELIVERABLES:

- Final report
- Final presentation
- Developed apparatus

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SPECIAL NOTE: It should be recognized that this Conceptual Abstract is written based on comments collected during OMIC R&D Road-mapping workshop and based on industries need for applied research. However, researchers as SMEs, are encouraged to lend specific technical feedback to further refine the Project Description and or Project Outcomes. The proposing researcher may do so either directly to OMIC R&D, or in the submitting proposal.

UTILIZATION OF OMIC RESOURCES: Researchers are encouraged to utilize the capital and personnel resources available on the OMIC R&D campus in their proposals. Use of OMIC time and machines should be included in the Proposal funding request. If use of OMIC resources are not identified in a proposal and are requested during, the project sponsor will be responsible for requesting a costed project amendment from the Tech Board.

PROJECT UPDATE EXPECTATIONS: Researchers are required to have monthly update discussion with OMIC R&D to provide a summary update on project status. This is done by way of a user-friendly format known as the OMIC 6-Block update. Typically, these meetings are scheduled on the first Wednesday and Thursday of each month. Secondly, depending on the scope of the project, OMIC R&D's industry Tech Board representatives are often interested in periodic project updates, and even in project participation. Researchers are required to communicate with supportive industry and facilitate communications as required.

PROJECT DURATION: It is OMIC R&D's strong preference that duration of a General Project aligns with the academic calendar cycle (July 2023 to June 2024). It is preferred that the project be completed by June 2024. Researchers are encouraged to factor in variables such as contracting, student hiring (if needed), procurement, holidays, and travel. It has been OMIC R&D's experience that a projects useful working duration is typically 9 to 10 months. Researchers are also encouraged to lend feedback, and to adjust the scope of work to best fit this preferred timeframe. Additionally, it is reasonable to even recommend phasing breakdowns to the project. In some unique circumstances, if the project is to take significantly longer than the duration of the academic year, this reasoning should be explicitly explained in the proposal.

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