OMIC R&D TECHNOLOGY BOARD

CONCEPTUAL ABSTRACT

TITLE: Robotic Smart Manipulation of Flexible Components

RELATED ROAD-MAPPING DESIGNATION ID#: R31

SUPPORTIVE INDUSTRY: Cobot Team, Caron, Boeing

PROJECT TYPE: General Project

PROBLEM STATEMENT (What Are We Trying to Solve?): In rigid part assembly, tactile sensing by a robotic arm can support successfully manipulating and otherwise interacting with rigid objects. Interaction with unconstrained or flexible objects, however, remains a realm typically supported by manual labor.

PROJECT DESCRIPTION: In particular, wire harness assembly is a common in-demand skill for robotic arms that have received little investigation and attention in robot grasping work. This project aims to use nascent tactile sensing abilities of smart robotic grippers, such as sliding a gripper along unconstrained, flexible cables and detecting when it reaches the termination point, to support proof-of-concept wire harness assembly demonstrations.

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

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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