

Autonomous Systems Scholarships for DMIE 2023/24 (Round 2)

With the tremendous success of the 2022/23 inaugural Autonomous Systems Scholarship programme offered to the E/18 DMIE group, this year we are extending it to the E19 DMIE (6th Semester) Group.

The Autonomous Systems Research Trust of the Faculty of Engineering, University of Peradeniya, would like to call for Expressions of Interest (EOI) from third-year Manufacturing and Industrial Engineering undergraduates who have already started their 6th semester in October 2023. This scholarship includes a monthly stipend of Rs 7500/- for three to four months provided that scholarship holders show satisfactory Progress in the voluntary projects assigned to them.

Scholarship holders are expected to

- a) work on one of the selected projects listed for the respective semester during their free time,
- b) provide a concise update at bi-weekly online meetings,
- c) produce a brief report one week after the end-of-semester examinations
- d) work closely with respective seniors (E/19) who might have carried out the 1st phase of the same project
- e) extend their support to the next batch of students if a particular project is continued for the following batch

Extensions are possible based on the final Report and the presentation contains sufficient evidence to formulate a final-year project that can deliver a high-quality outcome and interest in taking up this project for their final year research project (7th and 8th Semesters).

List of Topics

1. Photogrammetry-based reconstruction of three-dimensional environments

During last year, a methodology for reconstructing three-dimensional environments from a collection of monocular images was developed by a DMIE student. A model of the University Hindu Kovil was created and a mobile app was developed to explore this 3D model using a mobile phone. This project will explore how to extend this work, for example by digitizing exhibits in a museum and making this available for the general public and/or digitizing high-tech machines for use in operator training.

2. Design and development of a Semi-Automatic Selective Tea Plucking System (Mechanism Design)

Several aspects of developing a machine for the selective plucking of tea were explored last year. This project is aimed at extending this work, particularly focusing on a mechanism for plucking leaves selected as suitable. Work will involve the design of a mechanism and the development of a working prototype.

3. Design and development of a handheld instrument for measuring the thickness of metal sheets

The department has a prototype system, including electronic circuits and associated software, that can be used in measuring the thickness of metal sheets. This project will incorporate all available parts

in a portable handheld device calibrate it for use with different materials and evaluate it by field testing.

4. Design and development of two robot arms – two students

The department has purchased some of the parts from a commercially available kit for building a six-degree-of-freedom robot arm. One of the students will be involved in purchasing the remaining components of the kit and then assembling the parts to build the complete robot.

We have also built a mobile robot for use in a factory environment. One of the students is expected to design and build a robot arm that can be mounted on the mobile robot so that it can be used for transferring parts between machine tools and conveyors etc.

Interested students should submit an email indicating their interests in selected project(s), in the priority order (if select more than one title) and their competencies to carry out the selected project on or before 21/11/2023 (Next Tuesday). If the need arises we may call for short-listed candidates to face for an online discussion before finalization of candidates for the scholarships and project titles with short notice.

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**The Autonomous Systems Trust
Faculty of Engineering, UoP**

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