

Title: AI-Based Robotics Sensing for Interaction Reconstruction and Recognition of Human Activities

Subject code: 2600 (Robotics)

Research Supervisor profile:

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Outline of the proposed research:

Networked Robotics and Sensing Laboratory at the School of Engineering Science has been involved in designing various practical networked sensing/robotic systems which can be used for better connectivity and activity monitoring of people. This can be possible through design of ergonomic and reconfigurable sensing system which can be deployed in the living habitat. Majority of the multimodal sensing environments offer rich information regarding the scene and people. There also exist numerous processing tools (such as deep learning) which can be synthesized and utilized to extract information from the scene and detect objects and model of people. Through study of the existing prototypes, a suitable candidate system can be further integrated with other sensing environments that can be used for remote monitoring and reconstruction and for its further evaluation. Parts of this study is also the usage and utilization of ambient sensing which can be less intrusive and for protecting privacy of the people. This can be in the form of visual sensing, depth sensing or other types of ambient sensing which can be used to detect approximate locations and possible activities of a person. This contribution can be used as a part of the next generation enhancements and developments toward the autonomous to semi-autonomous remote augmented reality monitoring and control.

Outline of the student's role:

The proposed area of research has several fundamental focus areas which exposes the students to various notions in research and developments in the field of robotics. One of the main aspects of study is to understand what the main overlaps and utilization of various sensing modalities. As a part of the development, student will be involved in the integration of various sensing modalities with robotics setup and conduct data collection and interpretation.

Expected quality of the training to be received:

The proposed research and development are to be carried in the Networked Robotics and Sensing Laboratory at the School of Engineering Science. Student will have access to library

resources for collecting required background information. In addition, various components which are needed for the prototype developments are to be supplied to the student. The project will be documented through several reports and experimental demonstration of various prototypes.