

IMI RESEARCH SEMINAR

DATE: 21 June 2016, Tuesday

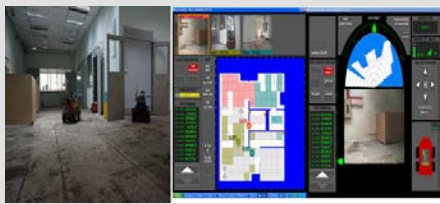
TIME: 11:00 am – 12:35 pm

VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01,
50 Nanyang Drive, Singapore 637553

*Lunch will be served

11.00am – 11.20am

Workload, Situation Awareness and Automation in Multiple-Robot Supervision



Dr WONG Choon Yue – Research Fellow, IMI-BTC

Using a single human to supervise multiple robots helps to address manpower constraints while deriving the benefits of multiple-robot deployment such as efficiency and improved system reliability. However, it can also induce high supervisor workload and diminish situation awareness. This talk explains workload and situation awareness. It also presents the effects and causes of workload and diminished situation awareness during multiple-robot supervision. The application of automation to address workload and situation-awareness concerns will be discussed. Automation is not a cure-all and must be applied with caution. The consideration of sliding autonomy for four aspects of task execution: information acquisition, information analysis, decision selection and action implementation is advocated. The appreciation for recognized methods of applying and triggering automation is also encouraged. The hope is for robots to be equipped with adjustable autonomy across multiple aspects of task performance to create robotic systems with highly flexible autonomy configurations. While robots from such systems may have the flexibility to deal with numerous situation requirements, the research challenge is understanding if and how such flexibility will affect human workload.

About Dr WONG Choon Yue

Wong Choon Yue is a research fellow of the BeingThere Centre (BTC). He received his PhD from the School of Mechanical and Aerospace Engineering in NTU under the supervision of Associate Professor Gerald Seet. and his thesis dissertation was focused on the cognitive challenges of deploying Single-Human Multiple-Robot systems for Urban Search and Rescue. His research focuses mainly on interface design and human-robot interaction. More recently, he has designed and developed the social robot called EDGAR.

11.20am – 11.35am

Calibration and Registration of Consumer-grade RGB-D Cameras



DENG Teng – Project Officer, IMI-BTC

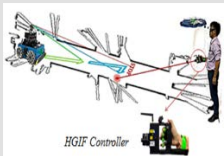
Nowadays, building up a 3D capturing system becomes an easy task, thanks to the advent of RGB-D sensors at commodity price such as Kinect. However, since these sensors are originally designed for human gesture recognition, the depth streams from these sensors are quite noisy when used in the field like real-time geometry and appearance acquisition. Thus, calibrating and registering these sensors requires additional efforts compared to the traditional ones. This presentation will give a summary on the existing works and discuss some of the future directions, such as using common 3D shape, e.g. chair, as a calibration target.

About DENG Teng

DENG Teng is currently pursuing his PhD degree at Nanyang Technological University. He received the B. Eng degree in School of Computer Engineering from Nanyang Technological University. His research interests include computer vision, 3D reconstruction and RGB-D sensor calibration and registration.

11.35am – 11.50am

Secured Multimodal Interface with Augmented Reality for Industrial Application: Framework and Implementation



Efficient industrial robot's detection, identification, tracking and programming by hand-pointing demonstration can be solved by integrating multiple sensory modalities such as haptic input, gesture input, laser pointing, range data, visual comments and task simulation. The goal is to create a partnership dialogue between a human and robot. In this talk, I will highlight the application of laser-generated outline-graphics as a viable addition to "Augmented- Reality". Its images are bright and of high contrast. This lends itself to applications in natural environments, both indoor and outdoor. In addition, I proposed a design framework and a simple example including GUI implementation in, human-mobile robot and shared environments for industrial application.

About DINH Quang Huy – PhD Student - August 2013 intake (IMI & MAE)

Huy is currently pursuing his PhD degree at Nanyang Technological University. He received the B.Eng degree in Electrical Engineering from Da Nang University of Technology, Vietnam. His research interests: Robotics, Computer Vision, Augmented Reality and related applications in industrial engineering.

His Supervisor is Assoc Prof Seet Gim Lee, Gerald, MAE and Co-Supervisor is Prof Nadia Thalmann, IMI.

11.50am – 12.35pm

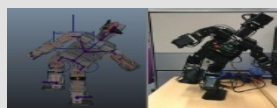
Introduction by Prof Nadia THALMANN, Director, IMI, followed by four visiting students from Xiamen University



1. XU Hanxiang - Customization of the Appearance for Humanoid Robot



2. WANG Qian - Extending Motion Skills for Humanoid Robot



3. BAO Binbin - Navigation – Children Robot



4. WANG Longbao - Knowledge-based Question and Answering in Human-Robot Interaction

