

IMI RESEARCH SEMINAR

DATE: 22 November 2016, Tuesday

TIME: *11:00 am – 12:25 pm+

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

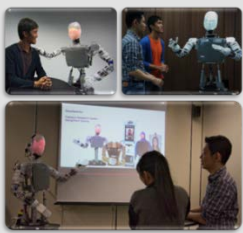
* Attendance is on first-come first-served basis due to limited seating.

+ Lunch will be served.

11.00am – 11.20am

15 mins presentation, 5 mins Q&A

Perception-link Behavior Model (PLBM): Associator



Face-to-face (FTF) communication has always been an effective and essential communication medium; however, it has its disadvantages. Upgrading the existing telepresence robot to a customizable anthropomorphic telepresence robot (CATR) seems like a probable solution to merge the advantages of FTF communication and computer-mediated communication (CMC). Unfortunately, a highly anthropomorphic system requires realistic behaviors to meet the observer expectation. One of the issues that deteriorate the realism in behavior is the decoupling situation, where an operator committed part of his behaviors to a non-interactive task, e.g. typing on keyboard. Hence, this representation discusses about a framework, PLBM with associator that can retrieve a coherence and expressive gesture during a decoupling situation.

About GU Yuanlong William – PhD Student, MAE & IMI (January 2012 intake)

William GU is currently pursuing his PhD degree at Nanyang Technological University, and he received the B.Eng. (Hons.) degree in School of Mechanical and Aerospace Engineering (MAE) from Nanyang Technological University. His research interests include applying and integrating various artificial intelligence and machine-learning approaches in different applications to solve existing issues.

His supervisor is Assoc Prof Gerald SEET Gim Lee, MAE and co-supervisor is Prof Nadia THALMANN, IMI

11.20am – 11.40am

15 mins presentation, 5 mins Q&A

ROS-based Solution for Automating Interior Finishing: Designing of an Autonomous Painting Robot



High ceiling painting is inevitable and common in building construction and is manually done by means of hydraulic lifts and often results in unreliable painting quality and low productivity. It occasionally poses lethal dangers to painting workers. A ROS-based robot is designed and fabricated to help increase the productivity of this painting process and eliminate the potential dangers to the painting workers. Preliminary experiments show that the proposed system has a better painting performance and relatively faster speed.

About LI Bingbing – PhD Student, EEE & IMI (January 2012 intake)

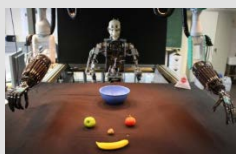
LI Bingbing is a part-time Ph.D. student at the School of Mechanical and Aerospace Engineering and the Institute of Media Innovation, Nanyang Technological University. He is now working as a Project Officer in School of Mechanical and Aerospace Engineering. His research interests include social robots, robot-human interaction, ROS-based industry solutions.

His supervisor is Prof CHEN I-Ming, MAE and co-supervisor is Prof Nadia THALMANN, IMI.

11.40am – 12.00pm

15 mins presentation, 5 mins Q&A

Object Localization and Grasping Part Detection



Object recognition is widely explored but object localization and grasping part detection has not been examined well. So far, this field of research has not been delved into. We combine object localization and grasping part detection in one shared neural network. It is an end-to-end solution which means inputting an image you can get information about where the objects are and which parts of the object we should grasp so that the grasping process looks more realistically human.

About YAO Fupin – Visiting Student, Huazhong University

YAO Fupin is a visiting student at Institute of Media Innovation, NTU. He received his B.Eng. at Huazhong University of Science and Technology, Wuhan, China. He is working in the area of social robotics under the supervision of Prof Nadia THALMANN, Director of IMI.

12.00pm – 12.20pm

15 mins presentation, 5 mins Q&A

Mutually Reinforcing Motion-Pose Framework for Pose Invariant Action Recognition



Manoj RAMANATHAN – Research Engineer, IMI

Actions are mainly characterized by specific poses and motion of body parts in an articulated manner. Recognizing a person's action from RGB videos can be useful in several applications like surveillance, behavior analysis, healthcare etc. But recognition from RGB videos is very difficult due to several challenges such as pose variations, view angle changes, occlusion etc. In this work, we combine both motion and pose in a mutually reinforcing framework to achieve pose-invariant action recognition. The proposed framework comprises of propagation motion forward path (PMF) that extracts pose-invariant motion features by assuming the neck and person's viewing direction is available and provides initial hypothesis of possible actions. Subsequently, the canonical pose feedback path (CPF) uses the action recognized by PMF along with a body part detection likelihood score to identify the pose in a frame and correct the erroneous motion features. This is again used in the PMF to enhance the action hypothesis until loop structure comprising both paths converges to the correct action. Experiments on benchmark datasets show the frameworks performance, pose-invariance, occlusion handling and partial view-invariance.

About Manoj RAMANATHAN

Manoj RAMANATHAN is a research engineer in Institute of Media Innovation, NTU. He received his B.Tech degree in instrumentation and control engineering from the National Institute of Technology, Tiruchirappalli, India, in 2009. He was working as a software engineer in Toshiba Software India Pvt. Ltd till 2012. He has submitted his PhD degree thesis in the School of Electrical and Electronic Engineering, NTU under the supervision of Assoc Prof Teoh Eam Khwang and Dr Yau Wei Yun (I2R, A-STAR). His research interests include computer vision, action recognition, pattern recognition and robotics.