

IMI RESEARCH SEMINAR

DATE: 4 September 2018, Tuesday

TIME: *11:00 am – 12:30 pm+

VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers Block, 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 – 11:30am

25 mins presentation, 5 mins Q&A



Understanding Human-Object Interaction in RGB-D videos for Human Robot Interaction

Detecting small hand-held objects plays a critical role for human-robot interaction, because the hand-held objects often reveal the intention of the human, thus helps the robots understand the human behavior and response accordingly. Existing solutions relying on wearable sensor to detect handheld objects often comprise the user experiences thus may not be preferred. With the development of commodity RGB-D sensors, e.g., Microsoft Kinect II, RGB and depth information have been used for the understanding of human actions and recognizing objects. Motivated by the previous success, we propose to detect hand-held objects using RGB-D sensor. Our system demonstrates a person can interact with a humanoid social robot with hand-held object such as a cell phone or a cup.

About Dr Fang Zhiwen– Research Fellow, Institute for Media Innovation

Dr Fang received his PHD from the School of Automation, Huazhong University of Science and Technology in 2017. He is currently working as a Research Fellow in the Institute for Media Innovation. His research interests include object detection and machine learning.

11:30am – 11:50am

15 mins presentation, 5 mins Q&A



Microtext Normalization in Natural Language Understanding

The proliferation of Web2.0 technologies and the increasing use of computer-mediated communication resulted in a new form of written text, termed microtext. This poses new challenges to natural language processing tools which are usually designed for well-written text. A huge amount of information is hidden in these new data and yet to be discovered, such as opinions, sentiments, emotions etc. An urge towards shorter message length facilitating faster typing and the need for semantic clarity, shape the structure of this non-standard form also known as the texting language or digital language. The talk fans out approaches for microtext normalization after introducing to the sources of microtexts. Then, it dives into application and challenges of microtext normalization. At the end, we discuss the future direction of the microtext normalization task.

About Ranjan Satapathy – Research Associate, Institute for Media Innovation

Ranjan Satapathy is a Research Associate at IMI, NTU where he is working on enhancing Nadine's interaction capabilities which includes dialog system manager, emotion recognition and multi-lingual capabilities. He is also a Ph.D student enrolled in SCSE, NTU. His research interests include sentiment analysis, sentic computing, natural language understanding and microtext understanding. He has also written a book titled "Sentiment Analysis in the Bio-medical Domain: Techniques, Tools, and Applications" in Springer (2018). Ranjan finished his M.Tech from University of Hyderabad, India in 2016 with distinction after which he joined Dr. Erik Cambria for his Ph.D studies in SCSE, NTU.

11:50am – 12:10pm

15 mins presentation, 5 mins Q&A



Object Detection in Occluded Scenarios

Object detection is a traditional problem in computer vision. Most of the earlier approaches are restricted to instance level object detection. Due to the advent of Deep Learning, object detection has achieved a reasonable progress in terms of accuracy and real-time performance. However, the major limitation of these state-of-the-art approaches is that the model does not learn the 'Scene Grammar' for the task of Scene Understanding. By 'Scene Grammar', we mean the spatial and hierarchical relationship present between the various objects present in a scene. Here, our goal is to extend the task of object detection a bit further, where we intend to model the 'Scene Grammar' for indoor scenes in order to perform open vocabulary object detection. Also, we are considering the functionality of different objects in order to model the relationship between them in our ongoing work.

About Ayan Kumar Bhunia – Project Officer, Institute for Media Innovation

Ayan Kumar Bhunia is currently working as Project Officer at Institute for Media Innovation (IMI), Nanyang Technological University (NTU). He completed B.Tech (Bachelor of Technology) majoring in Electronics and Communication Engineering from West Bengal University of Technology, India. His research interests include various subdomains of computer vision and deep learning.

12:10pm – 12:30pm

15 mins presentation, 5 mins Q&A



T2Net: Synthetic-to-Realistic Translation for Solving Single-Image Depth Estimation Tasks

Current methods for single-image depth estimation use training datasets with real image-depth pairs or stereo pairs, which are not easy to acquire. We propose a framework, trained on synthetic image-depth pairs and unpaired real images, that comprises an image translation network for enhancing realism of input images, followed by a depth prediction network. A key idea is having the first network act as a wide-spectrum input translator, taking in either synthetic or real images, and ideally producing minimally modified realistic images. This is done via a reconstruction loss when the training input is real, and GAN loss when synthetic, removing the need for heuristic self-regularization. The second network is trained on a task loss for synthetic image-depth pairs, with extra GAN loss to unify real and synthetic feature distributions. Importantly, the framework can be trained end-to-end, leading to good results, even surpassing early deep-learning methods that use real paired data.

About Zheng Chuanxia – PhD Student, Nanyang Technological University

Chuanxia is currently pursuing his PhD degree at Nanyang Technological University. He received the B.Eng degree in Electrical Engineering from Beihang University, China in 2017 and M.Sc degree in Electronic and Information Engineering from Beijing Jiaotong University, China in 2014. His research interests include machine learning, computer vision, especially in scene understanding, generation and reconstruction.