

IMI RESEARCH SEMINAR

Tuesday 26 March 2019 11:00 am – 12:30 pm
Institute for Media Innovation 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 – 11:45am

35mins presentation, 10 min Q&A



Prof Marina Gavrilova

Director
Biometric Technologies Laboratory

Professor and Associate Head
Department of Computer Science
University of Calgary, Alberta
Canada

Smart Technologies for Societies of Tomorrow

Human identity recognition is one of the frequent tasks performed by government, social services, consumer, financial and health institutions worldwide. Biometrics are increasingly used in a gamut of applications to mitigate vulnerabilities and to ensure protection against an unauthorized access or a data breach. Traditionally, physiological or behavioral biometric data was collected in a controlled environment at discrete moments of time from stationary sensors. Accelerated pace of technological innovations and increased degree of device connectivity created limitless possibilities for continuous, dynamic and intelligent integration of new types of data. This lecture discusses how data obtained from smart sensors, information sharing platforms, online communication tools, and IoT devices can be integrated into new generation decision-making systems. It will describe the identity system that can extract specific spatial, temporal, behavioral, knowledge, subject and aesthetics information based on data collected from social platforms and conclude with some practical case studies.

About the Speaker

Dr. Gavrilova is a full professor in the CSPA Dept. and an international expert in the area of biometric security, machine learning, pattern recognition, data analytics, and information fusion. Dr. Gavrilova is a co-founder of the Biometric Technologies Laboratory, as well as a Founding Editor-in-Chief of a Springer Transactions on Computational Sciences Journal. Dr Gavrilova serves on Editorial boards of IEEE Transactions on Computational Social Sciences, IEEE Access, the Visual Computer, the International Journal of Biometrics and the International Journal of Cognitive Biometrics. List of publications includes three co-authored books, and 200+ peer reviewed papers on machine learning, biometric security, and multi-modal cognitive system architectures. Over 50 invited keynote speeches, workshops and panel presentations were delivered at premium international conferences and research centers worldwide.

11:45am – 12:05pm

15 mins presentation, 5 mins Q&A



Dr Manoj Ramanathan

Research Fellow
Institute for Media Innovation

Study/ Review of Speechless Interaction Techniques in Social Robotics

With recent developments in the field of artificial intelligence, machine learning, deep learning, the field of social robotics has gained momentum. Any social robot requires to interact with human users and its environment. Any human-robot interaction involves two aspects, speech based interactions and speechless interactions. Among the two, the latter is an essential requirement to make the social robot appear convincing and believable. In this study, we review speechless interaction techniques that have been considered in social robotics. Traditional speechless interaction considers mainly non-verbal communication cues like gazing, user action/gesture based interaction, body language, emotion, personality detection. But in current scenario with social robotics finding more applications in healthcare (autism care), education (for deaf and dumb), office work (insurance) etc, we should consider two more speechless communication techniques. Firstly, recently, Optical Character Recognition (OCR) has become more prominent to understand/ analyze document contents. Any robot that can read and understand document contents opens a new way of communication with it. By reading the robot will also be able to understand any document or online content, which can help the robot to tell stories, interact with speech-impaired people, handle official documents etc. Secondly, with social media development, a new way communication has opened up. People can communicate without being face-to-face. Any robot can have simple online communication like e-mail etc to more sophisticated communication like Facebook, Twitter etc. In this review, we look at speechless interaction methods and corresponding reaction models in social robotics not restricting to non-verbal cues, but include reading and social media presence of robots, which are relatively new. Also, we look at the current state of these speechless cues to identify limitations and possible solutions for these challenges in social robotics.

About the Speaker

Manoj Ramanathan received his B.Tech degree in instrumentation and control engineering from the National Institute of Technology, Tiruchirapalli, India, in 2009. He was working as a software engineer in Toshiba Software India Pvt. Ltd till 2012. He received his PhD degree in 2017 from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. His research interests include computer vision, action recognition, biometrics and Robotics. Currently, He is working as a research fellow in Institute for Media Innovation, Nanyang Technological University, Singapore. He works mainly on computer vision, speech related modules of Nadine, realistic humanoid social robot. He is editorial assistant of The Visual Computer journal and reviewer of ICPR 2018.

12:05pm – 12:25pm

15 mins presentation, 5 mins Q&A



Leong Mei Chee

IGS-IMI PhD Student
August 2015 Intake
Institute for Media Innovation

Spatio-temporal Aggregation Network for Video-level Action Recognition

Human action recognition has been an active research with valuable applications in surveillance, healthcare, sports science, etc. Deep learning approaches, such as ConvNets, have demonstrated superior potential in discovering discriminative underlying features, and achieved great performance in various classification tasks. This work aims to study video-level action recognition via a sparse sampling strategy for temporal modeling of motion dynamics. We adopt pre-trained 2D ConvNets and extend the network to encode intermediate spatio-temporal features. Our end-to-end framework efficiently learns features aggregation to better distinguish similar local motions that come from different action sequences. Class scorings obtained across multiple video segments are fused for the final prediction. We report comparable performance with multi-stream architectures and 3D ConvNets in action recognition task.

About the Speaker

Mei Chee is currently a fourth year PhD student in IMI under the supervision of Assoc Prof Lee Yong Tsui from MAE and Assoc Prof Lin Feng from SCSE. Her research topic is on human action recognition and motion recovery from videos. She obtained her B. Eng degree in Manufacturing Engineering from National University of Malaysia and M.Sc in Digital Media Technology from NTU. Her research interests include computer vision, 3D reconstruction and machine learning.

- Supervisor: Assoc Prof Lee Yong Tsui, MAE
- Co-Supervisor: Assoc Prof Lin Feng, SCSE
- Mentor: Assoc Prof Cai Yiyu, MAE

12:25pm – 12:30pm

Closing Remarks

12:30pm

End of Research Seminar