

IMI RESEARCH SEMINAR

Tuesday, 20 November 2018 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 – 11:30am

25 mins presentation, 5 mins Q&A



Dr Xia Xinxing

Research Fellow
Institute for Media Innovation

Towards Efficient 3D Calibration for Different Types of Multi-View Autostereoscopic 3D Displays

A novel and efficient 3D calibration method for different types of autostereoscopic multi-view 3D displays is presented. In our method, a camera is placed at different locations within the viewing volume of a 3D display to capture a series of images that relate to the subset of light rays emitted by the 3D display and arriving at each of the camera positions. Gray code patterns modulate the images to significantly reduce the number of images captured by the camera and thereby accelerate the process of calculating the correspondence relationship between the pixels on the 3D display and the locations of the capturing camera. This method has been successfully tested on two different types of multi-view 3D displays. The experimental results show that this novel method can also be used to improve the image quality by reducing the frequently observed crosstalk that typically exists when multiple users are simultaneously viewing multi-view 3D displays from a range of viewing positions.

About the Speaker

Dr Xia Xinxing is currently a Research Fellow at IMI, NTU since December 2017. Previously, he worked as a Research Fellow at the Advanced Display Lab, EEE in NTU from Nov 2016. In 2014-2016, he was a postdoctoral researcher at UNC (USA), and visited the BeingThere Centre at NTU. He received his PhD on optical engineering at State Key Laboratory of Modern Optical Instrumentation, Zhejiang University, China. His dissertation research focused on the principle and establishment of horizontal-parallax-only light field 3D displays and his research interest lies in 3D displays and acquisition, VR/AR displays, computational imaging and some related applications on 3D Telepresence.

11:30am – 11:50am

15 mins presentation, 5 mins Q&A



Debsubhra Chakraborty

IMI-IGS PhD Student
Institute for Media Innovation

Prediction of Negative Symptoms of Schizophrenia from Objective Linguistic, Acoustic and Non-verbal Conversational Cues

Speech disorders are among the salient characteristics of negative symptoms of schizophrenia. Such impairments are often exhibited through disorganized speech, inappropriate affective prosody, and poverty of speech. The current method of detecting such symptoms requires the expertise of a trained clinician, which may be prohibitive due to cost, stigma or high patient-to-clinician ratio. An objective method to extract nonverbal and verbal speech-related cues can help to automate and simplify the assessment method of severity of speech-related symptoms of schizophrenia. In this paper, a novel automated method is presented which uses speech content from schizophrenic patients to predict the clinician-assigned subjective ratings of their negative symptoms. Specifically, the interviews of 50 schizophrenia patients were recorded and features related to acoustics, linguistics and non-verbal conversation were extracted. The subjective ratings can be accurately predicted from the objective features with an accuracy of 64-82% using machine learning algorithms with leave-one-out cross-validation. Our findings support the utility of automated speech analysis to aid clinician diagnosis, monitoring and understanding of schizophrenia. accuracy of 83%.

About the Speaker

Debsubhra is currently pursuing his PhD degree with the Institute for Media Innovation, under the Interdisciplinary Graduate School at Nanyang Technological University, Singapore. He received his B. E. (Hons.) degree in Electrical Engineering from Jadavpur University, India in 2009 and M. Tech. degree in Systems and Control Engineering from IIT Bombay, India 2011. His research interests include human social behavior understanding, speech processing, and video processing.

11:50am – 12:10pm

15 mins presentation, 5 mins Q&A



Liu Tianrui

IMI-IGS PhD Student
Institute for Media Innovation

Unstructured Point Cloud Segmentation and Classification

Traditionally, point cloud can be segmented and classified using primitive shape fitting and carefully handcrafted features. Thanks to recent advancements in deep learning, many have shown state-of-art results on 3D data processing with neural networks. One of the most promising approaches is to directly work on unordered point set. The first pioneer work is PointNet, which extracts high-dimensional local features for each point and concatenates max-pooled global feature for segmentation and classification. However, PointNet fails to capture the spatial context around vicinity or larger spatial neighborhood. In our work, the most recent improvements tackling this problem have been reviewed and inspiration has been drawn for our on-going work.

About the Speaker

Tianrui is currently pursuing his Ph.D. degree at Nanyang Technological University. He received his B.Eng degree in Aerospace Engineering from Nanyang Technological University, Singapore in 2018. His research interests include computer graphics and computer vision, especially in point cloud processing and augmented reality.

12:10pm – 12:30pm

15 mins presentation, 5 mins Q&A



Anoop Kumar Sinha

IMI-BTC PhD Student
Institute for Media Innovation

Developing Upper Limbs for Social Humanoid Robot Nadine

Humanoid robots because of their human like morphology are quite fascinating for most people. Human-like functionality and appearance are two important aspects of a social humanoid robot. Social robots with upper limbs which matches the human arm in functionality as well as in appearance are still under research and development in most research laboratories. This talk explores the concurrent design approach for developing a robotic upper limb after introducing a few state of the art robotic upper limbs. Two novel designs for developing the same - one using traditional actuators and the other using smart materials will be discussed. We will also discuss the scope and use of smart materials for developing a soft robotic arm.

About the Speaker

Anoop Kumar Sinha is currently a PhD student at Institute for Media Innovation (IMI), Nanyang Technological University (NTU) Singapore. He completed his M.Tech (Master of Technology) majoring in Mechatronics Engineering from Indian Institute of Technology (IIT) Patna, India and B.Tech (Bachelor of Technology in Mechanical Engineering from Uttar Pradesh Technical University Lucknow, India. His research interests include human-robot interaction, soft robotics, and smart materials for robotic applications.