

IMI RESEARCH SEMINAR

DATE: 17 November 2015, Tuesday

TIME: 11:00 am – 12:45 pm

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

*Lunch will be served

11.00am – 11.40am

Nonlinear Storytelling and Interaction



Assistant Professor Yingying SHE – Visiting Professor, Software School, Xiamen University

Non-linear storytelling is a narrative technique which could be combined with HCI and AR techniques to enhance the sense of the immersion for digital media products. Our work is to discover the inference and interactive model which could overlay timelines from real world and story in real-time to generate fusion interaction experience in games and films.

About Assistant Professor Yingying SHE

Yingying SHE is Assistant Professor at Xiamen University in the School of Software. She received her Ph.D. in Computer Science under the supervision of Prof. Peter Grogono at Concordia University in Canada. Her research interests include [Natural](#) User interface, Cognition-aware computing, Data Mining and Visualization, and Serious Games. Her current research projects at XMU focus on human-centered multi-modal interaction, social robotics cognitive system design and non-linear/interactive narrative in games.

11.40am – 12.05pm

Extracting and Manipulating Lighting through Intrinsic Image Decomposition



Dr LAFFONT Pierre-Yves – Visiting Researcher, ETH Zurich, Switzerland

The visual appearance of a scene changes dramatically over time. Specific lighting conditions, such as the "golden hours" around sunset and sunrise, can be hard to capture in photographs because of their transient nature -- they change quickly. Despite recent advances in image editing software, common image manipulation tasks such as lighting editing require significant expertise to achieve plausible results.

In this talk, we focus on extracting and manipulating the lighting in photographs. Intrinsic image decomposition separates a photograph into independent layers: reflectance, which represents the color of the materials, and illumination, which encodes the effect of lighting at each pixel. We tackle this ill-posed problem by leveraging additional information provided by multiple photographs of the scene. The methods we describe enable advanced image manipulation such as lighting-aware editing, insertion of virtual objects, and image-based illumination transfer between photographs.

About Dr LAFFONT Pierre-Yves

Pierre-Yves Laffont is a postdoctoral researcher at ETH Zurich (Switzerland) and is currently visiting the BeingThere Centre at NTU in Singapore. His recent research focuses on the appearance of outdoor scenes, intrinsic image decomposition, and image-based rendering/relighting with geometric cues from multi-view reconstruction. He did his PhD at INRIA Sophia-Antipolis with George Drettakis and Adrien Bousseau, and his postdoc at Brown University with James Hays. He spent a few months at UC Berkeley and MIT CSAIL (USA), and also studied at INSA Lyon (France) and at KAIST (South Korea).

12.05pm – 12.25pm

3D Dynamic Meshes Compression via Sparse Low-Rank Matrix Approximation



Low-rank matrix approximation (LRMA) is a powerful technique for signal processing and pattern analysis. However, its potential for data compression has not been fully investigated in the literature yet. In this talk, I will present our proposed *sparse* low-rank matrix approximation (SLRMA), an effective computational tool for data compression. SLRMA extends the conventional LRMA by exploring both the intra- and inter-coherence of data samples *simultaneously*. Experimental results show that (i) SLRMA empirically converges well; (ii) SLRMA can produce comparable approximation error as LRMA but in a much sparser form; (iii) SLRMA-based compression scheme outperforms the state-of-the-art scheme to a large extent in terms of rate-distortion performance.

About HOU Junhui (EEE & IMI)

Junhui is currently pursuing his PhD student at Nanyang Technological University. He received the B.Eng degree in information engineering (Talented Students Program) from South China University of Technology, Guangzhou, China, and the MEng in signal and information processing from Northwestern Polytechnical University, Xi'an, China. His research interests: image/video/3D motion data compression, motion capture data processing.

His Supervisor is Assoc Prof Lap-Pui CHAU, EEE and Co-Supervisors are Prof Nadia THALMANN, IMI and Assoc Prof Ying HE, SCE.

12.25pm – 12.45pm

Non-Verbal Speech Analysis of Interviews with Schizophrenic Patients



Negative symptoms in schizophrenia are associated with significant burden and functional impairment, especially speech production. In clinical practice today, there are no robust treatments for negative symptoms and one obstacle surrounding its research is the lack of an objective measure. To this end, we explore non-verbal speech cues as objective measures. Specifically, we extract these cues while schizophrenic patients are interviewed by psychologists. We have analysed interviews of 20 patients who were enrolled in an observational study on the effectiveness of Cognitive Remediation Therapy (CRT). The subject (undergoing CRT) and control group (not undergoing CRT) contains 9 and 11 individuals respectively. The patients were recorded during three sessions while being evaluated for negative symptoms over a 12-week follow-up period. In order to validate the non-verbal speech cues, we computed their correlation with the Negative Symptom Assessment (NSA-16). Our results suggest a strong correlation between certain measures of the two rating sets. Supervised prediction of the subjective ratings from the non-verbal speech features with leave-one-person-out cross-validation has reasonable accuracy of 53-80%. Furthermore, the non-verbal cues can be used to reliably distinguish between the subjects and controls, as supervised learning methods can classify the two groups with 80-93% accuracy.

About Yasir TAHIR (EEE & IMI)

Yasir is currently pursuing his PhD degree at Nanyang Technological University, Singapore. He obtained his Bachelor in Electronics Engineering from Ghulam Ishaq Khan Institute, Pakistan. His major area of research is to understand human behaviour using audio-visual behavioural cues. The objective is to facilitate conversations by providing effective and timely feedback.

His Supervisor is Asst Prof Justin DAUWELS, EEE and Co-Supervisor is Prof Daniel THALMANN, IMI.