IMI RESEARCH SEMINAR

Thursday 31 January 2019   11:00 am – 1:00 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

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11:00am – 11:50am

40 mins presentation, 10 mins Q&A

Assoc Prof Nils Thuerey
Technical University of Munich

Physics-based Deep Learning for Fluids

In this talk, Assoc Prof Nils Thuerey will focus on the possibilities that arise from recent advances in the area of deep learning for accelerating and improving physics simulations. He will focus on fluids, which encompass a large class of materials we encounter in our everyday lives. In addition to being ubiquitous, the underlying physical model, the Navier-Stokes equations, at the same time represent a challenging, non-linear advection-diffusion PDE that poses interesting challenges for deep learning methods.

Assoc Prof Nils Thuerey will explain and discuss several research projects from our lab that focus on temporal predictions of physical functions, temporally coherent adversarial training, and predictions of steady-state turbulence solutions. Among other things, it turns out to be useful to make the learning process aware of the underlying physical principles. Here, especially the transport component of the Navier-Stokes equations plays a crucial role. He will also give an outlook about open challenges in the area of deep learning for physical problems. Most importantly, trained models could server as priors for a variety of inverse problems and control tasks.

About the Speaker

Nils Thuerey is an Associate-Professor at the Technical University of Munich (TUM). He works in the field of computer graphics, where a central theme of his research are physics simulations and deep learning algorithms. He acquired a Ph.D. for his work on liquid simulations in 2006 from the University of Erlangen-Nuremberg. Until 2010 he held a position as a post-doctoral researcher at ETH Zurich. He received a tech-Oscar from the AMPAS in 2013 for his research on controllable smoke effects. Subsequently, he worked for three years as R&D lead at ScanlineVFX, before starting at TUM in October 2013.

11:50am – 12:10pm

15 mins presentation, 5 mins Q&A

Cai Yujun
IMI-IGS PhD Student
Aug 2017 Intake
Institute for Media Innovation

Weakly-Supervised 3D Hand Pose Estimation from Monocular RGB Images

Compared with depth-based 3D hand pose estimation, it is more challenging to infer 3D hand pose from monocular RGB images, due to substantial depth ambiguity and the difficulty of obtaining fully-annotated training data. Different from existing learning-based monocular RGB-input approaches that require accurate 3D annotations for training, we propose to leverage the depth images that can be easily obtained from commodity RGB-D cameras during training, while during testing we take only RGB inputs for 3D joint predictions. In this way, we alleviate the burden of the costly 3D annotations in real-world dataset.

About the Speaker

Yujun is currently pursuing her PhD degree at Nanyang Technological University. She received her B.Eng from Southeast University, China in 2017. Her research interests include machine learning and computer vision.

- *Supervisor: Prof Cai Jianfei, SCSE*
- *Co-Supervisor: Assoc Prof Cai Yiyu, MAE*
- *Mentor: Prof Nadia Thalmann, Director of IMI and Visiting Professor, SCSE*

12:10pm – 12:30pm

15 mins presentation, 5 mins Q&A

Zhang Zhijie
BTC (SCSE) PhD Student
Jan 2018 Intake
Institute for Media Innovation

The Prediction of Human Engagement Intention in Multiparty Interaction

Human-Robot Engagement is a complex problem that can be interpreted as the process in which a robot interacts with humans from initial contact to the end of the interaction. I try to tackle a problem who has the intention to interact with the robot based on multimodal features. The work also aims to improve the stability of the prediction. Although the problem comes before a real interaction, by predicting the engagement intention, a robot can manage engagement actions and interact with those who opportunistically decide to engage. Moreover, the robot then is able to handle the dynamic environment and equipped with capacity for natural interaction.

About the Speaker

Zhijie received his first degree in Mechanical Engineering from Southeast University, China in 2015 and M.Sc. (Master of Science) in Smart Product Design from Nanyang Technological University, Singapore. Currently, he is pursuing his Ph.D. degree and his research interests include Human-Robot Interaction, specifically, in Multiparty Human-Robot Interaction.

- *Supervisor: Assoc Prof Zheng Jianmin, SCSE*
- *Co-Supervisor: Prof Nadia Thalmann, Director of IMI and Visiting Professor, SCSE*

12:30pm – 1:00pm   ### Discussion

1:00pm   ### Start of Lunch Networking Session and End of Research Seminar