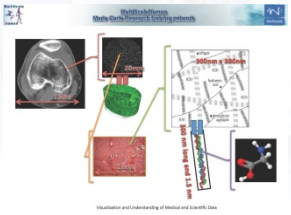
NANYANG TECHNOLOGICAL UNIVERSITY

institute for media innovation
The avant-garde place

IMI RESEARCH SEMINAR

DATE: 26 August 2014, Tuesday
TIME: 11:00 am – 12:35 pm
VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01
50 Nanyang Drive, Singapore 637553
*Lunch will be served



Prof Franz-Erich WOLTER

Visiting Professor,
Leibniz University
Hanover, Germany

Visualization Understanding of and Interaction with Medical and Scientific Data

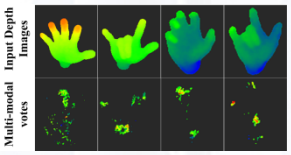
This talk presents an overview on problems and methods computer scientists are involved in whenever they are developing a system useful for visualizing, understanding and interacting with bio medical or other scientific data. Those data include static multi scale 3D- image data as well as time variable 3D- data or even higher dimensional time variable multi scale data. The outline presented in this talk motivates major parts of Welfenab`s research on developing a visualisation system to be used by his partners in the EU - funded "Multi Scale Human (MSH) Marie Curie research training net work".

Prof Arjan EGGES

Visiting Professor,
Utrecht University,
The Netherlands

Collision Models for Dense Crowds

Simulating a crowded scene like a busy shopping street requires tight packing of virtual characters, increasing the likelihood of collisions occurring. Full collision detection is too expensive for crowds, so simplifications are needed. We introduce the bounding cylinder hierarchy (BCH) that uses vertical cylinders as bounding shapes. Since the BCH is a generalization of the single cylinder, it easily integrates with existing crowd simulation systems. We compare the BCH with commonly used collision shapes, namely the single cylinder and the oriented bounding box tree. We also report on a user study that evaluates how well people are able to recognize collisions between characters. This study give insights into the required precision of collision models for dense crowds.

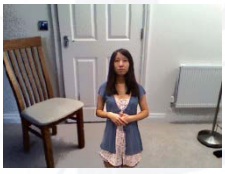


LIANG Hui

PhD Student,
EEE / IMI

Improved Hand Pose Estimation via Multimodal Prediction Fusion

Recovering the hand pose from the visual inputs is a challenging task as the human hand is highly flexible. Although the recent work on full-body pose estimation has shown promising results, their performance on the hand is still far from satisfactory due to its more severe self-occlusion. We propose to predict the 3D joint positions from the depth images by enforcing the hand motion constraints to fuse the per-pixel prediction results. The posterior distribution of the joints is formulated as a weighted Product of Experts model based on the per-pixel predictions, and can be efficiently maximized via the Expectation-Maximization algorithm subject to the low dimensional assumption of the hand joint parameter space. The experimental results show the proposed method achieves considerably higher prediction accuracy compared to the rivals on both the synthesized and the annotated real-world datasets.



ZHAO Mengyao

PhD Student,
SCE

High-quality RGBD Background Composition

Real-time background composition has various application scenarios. However, most research directly replaces the background with 2D image, and few have combined depth information with background composition.
This has led to unnatural composition result due to the mismatch of the background scenes when captured, and the creativity of new scene is limited by direct background replacement.
In this project, we would like to extend the conventional 2D background composition to 3D with RGBD information.
The difficulty of this mainly lies on the mismatch of the two different scenes which can be divided into “Camera Mismatch” and “Scene mismatch”.
The scene mismatch is mainly responsible for perceptive reality.
Therefore, our main objective in this study is the adjustment of scene mismatch in two RGBD scenes to produce a new natural 3D scene in an automatic way.

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