NANYANG TECHNOLOGICAL UNIVERSITY

institute for media innovation
The avant-garde place

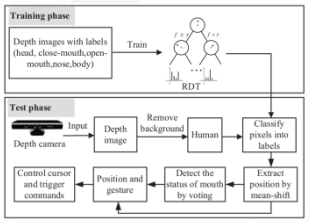
IMI RESEARCH SEMINAR

DATE: 14 October 2014, Tuesday
TIME: 11:00 am – 12:30 pm
VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01
50 Nanyang Drive, Singapore 637553
*Lunch will be served

Dr Lewis CHUANG
Project Leader, MPI,
Tuebingen, Germany

Look What Look, See What See? Insights Into How Humans Retrieve Visual Information

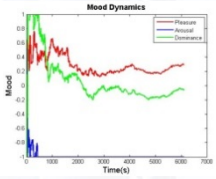
Eye- and body-motion-tracking offers remarkable leverage into observing human behavior without interrupting behavior itself. It releases the behavioural researcher (and the hapless participant) from the traditional dictate (in psychophysical experimentation) to constrain voluntary movements and stimuli presentation. In this talk, I will first address the approaches by which we can determine the gaze of a freely moving observer. Following this, I will explain how tracking technology allows us to understand how humans seek out task-relevant information in their visual environment. Next, I will share one example of how tracking allowed us to define the properties (i.e., scene complexity) of the visual scene from the perspective of the observer, as opposed to low-level image statistics. Finally, I will discuss how real-time tracking could be exploited in human-machine interfaces, albeit only with proper appreciation of natural human behavior.



BIAN Zhenpeng
PhD Student,
EEE / IMI

Human Computer Interface for Quadriplegic People Based on Face Position/Gesture Detection

Quadriplegic people have great difficulties to use standard input devices of personal computers, such as mouse. It is very important to develop a suitable assistive technologies (ATs) for Quadriplegics.
We propose a human computer interface using a depth camera for quadriplegic people. The nose position is employed to control the cursor along with the commands provided by mouth's status. The detection of nose position and mouth's status is based on randomized decision tree algorithm. The experimental results show that the proposed interface is comfortable, easy to use, robust, and outperforms the existing assistive technology.



ZHANG Juzheng
PhD Student,
SCE / IMI

Personality-Characterized Mood Dynamics Model for Autonomous Agents in Continuous Interactions

People with certain personalities have their own behavior patterns. Their personalities are usually recognized through continuous interactions and influence almost every aspects of their lives.
To make an autonomous agent more believable, we argue that the personality of an autonomous agent should determine the characteristics of its mood dynamics, and further determines the characteristics of its behaviors. In this paper, We propose a personality-characterized mood dynamics (PCMD) model for autonomous agent, in which the personality determines the tendency of the mood by weighting different types of emotions.
For certain personality, we obtain appropriate weights for emotions by solving an optimization problem, to make the expected mood direction approaches to the personality direction within enough long time in continuous interactions. Numerical simulations and comparisons with the previous methods illustrate the effectiveness and the robustness of our model.

Shakeel AHMAD
PhD Student,
EEE / IMI

Distributed Neighbour Selection Problem in Multi-Robot Distributed Formation Control Image

This work addresses the problem of distributed neighbour selection which helps in achieving scalable, reconfigurable formations for multi-robot systems. The global objective of achieving a desired formation is obtained by dividing it into a set of local objectives which are achieved in a distributed manner. The previous work made use of a neighbor selection algorithm which relied on centralized information. Another drawback of previous neighbor selection algorithm was that it could not be generalized. In this work, the possibility of having scalable and reconfigurable formations for multi-robot systems is considered without relying on the centralized information. The local task functions are accomplished using task-priority inverse kinematics controllers and the conflicts among them are resolved using Null Space Behavioral approach.

Please click here to register