**IMI PhD Interdisciplinary Seminar**

**DATE:** 12 March 2013, Tuesday  
**TIME:** 11:00 am - 12:35pm  
**VENUE:** IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01 50 Nanyang Drive, Singapore 637553  
*Lunch will be served*

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**EVALUATING THE PERFORMANCES OF ARTIFICIAL SOCIAL AGENTS OF DIFFERENT EMBODIMENTS IN ASSISTING THE HUMAN IN A REAL-WORLD TASK**

Dr S M Mizanoor Rahman  
Research Fellow  
IMI

Two artificial social agents of different embodiments were developed and enriched with various similar functionalities. These agents were employed separately to assist the human in performing a real-world task. Performance measurement method, the standards for the performances of the agents and an algorithm for the cooperation between the virtual human and the robot in finding the object were developed. The performances were subjectively evaluated and compared with the standards. Various hypotheses regarding the performances of the agents while interacting between themselves and with the human were tested. The results show that the performances of both the virtual human and the social robot were satisfactory though there were differences in the performances due to the differences in their embodiments, anthropomorphism etc.

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**INTERACTIVE FREE-FORM SHAPE MODELING IN CYBERWORLDS**

LAI Danbo  
PhD Student  
IMI/SCE/NIE

When procedural models based on implicit functions are used for defining complex shapes, the final model may become slow for rendering. We propose an algorithm for accelerating such rendering for free-form shape modeling where some initial shape is gradually modified by other implicitly-defined shapes with relatively smaller sizes compared to the final function script, which makes the rendering of the whole shape faster.

The resulting accelerated function scripts can be then rendered on any suitable rendering platform that we illustrate by using function-based extension of VRML/X3D and POV-Ray.

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**PSYCHO-SOCIOLOGICAL MODELS FOR VIRTUAL AGENTS AND GROUPS**

Jaroslaw Kochanowicz  
PhD Student  
IMI/SCE

Social simulation is a young and vibrant discipline interested in modeling structure of the society, processes and relations within it. In this presentation, I will discuss current limitations in the field and present a novel modeling approach and cognitive-affective architecture elements for believable social agents capable of supporting explicit cultural contents. While arguing necessity of application of psychologically complex individual agents for scenarios of group culture I will propose expansion of typical existing agent models with socio-cultural element based on significant concepts from psychology and sociology. I will also show how it enables creation of agents with more believable personality and other characteristics, and may in future allow new level of group culture emergence.

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**HUMAN BEHAVIOUR CAPTURING AND RETARGETING IN TELE-PRESENCE**

LI Bingbing  
PhD Student  
MAE/IMI

In a natural communication between two people, body language accounts 55% of the total meaning of the message.

In the project, we develop a method to capture the body movement of a user, quantize the motion, make a simplified motion which is performable for a robot and retarget the motion to the robotic avatar. In the same time, this retargeting needs to keep as much information of the message as possible. Inertia sensors are used as primary data acquisition sensors. A further development of this model including behaviour prediction will be discussed.

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