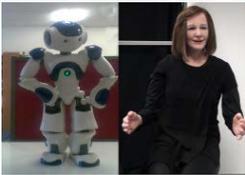# IMI PHD INTERDISCIPLINARY SEMINAR

DATE: 14 January 2014, Tuesday
TIME: 11:00 am – 12:10 pm
VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01
50 Nanyang Drive, Singapore 637553
*Lunch will be served

Dr Aryel BECK
Research Fellow, IMI

### Non Verbal Communication of Emotions in Social Robots

The development of social robots that convey emotion with their bodies, instead of or in conjunction with their faces, is an increasingly active research topic in the field of human-robot interaction. Rather than focusing either on postural or on dynamics aspects of bodily expression in isolation, I will present a model along with empirical results where we combined both elements and produce expressive behaviors by adding dynamic elements to a subset of static postures prototypical of basic emotions, with the aim of creating expressions easily understandable and at the same time lively and flexible enough to be believable and engaging.

ZHANG Wenjing
PhD Student
IMI/SCE

Inversion Free and Topology Compatible Tetrahedral Mesh Warping Driven by Boundary Surface Deformation

Warping a tetrahedral mesh driven by boundary surface deformation is useful in many applications. It is a challenging problem to construct an inversion free warped mesh maintaining a compatible topology. We solve these two problems by a novel method that combines radial basis function (RBF)-based warping and adaptive mesh refinement. We iteratively transform the mesh using RBF-based warping with a safe step size to ensure that no element is inverted. The use of the RBF-based warping ensures a smooth warping and thus generates a high-quality warped volumetric mesh. To avoid too small step sizes, we refine the elements that are potentially inverted. The refinement is performed on the original and the warped meshes in the same way so as to maintain compatible topology between them.
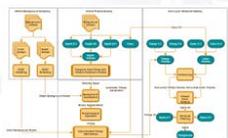
ZHAO Mengyao
PhD Student
SCE

Real-time Foreground Extraction with RGBD Camera for 3D Telepresence

3D telepresence is a state-of-art multimedia application where remote collaborators can communicate with each other in an immersive video-conferencing environment. And such system usually requires extraction of the dynamic foreground for use in background substitution and other synthesis applications. Many conventional image/video foreground extraction methods have been used. However, noticeable flickering artifacts can often occur along foreground boundaries due to the temporal inconsistency. To enhance visual quality in 3D telepresence, we propose an integrated RGBD foreground extraction pipeline where 3d matting method is combined with various techniques, e.g., shadow detection, to create more life-like coherent foreground extraction result. We also develop a GPU-based CUDA implementation that can perform real-time foreground extraction with RGBD camera. Results from the experiments show that our method can extract higher quality and more consistent foreground compared to existing methods like closed-form matting and FreeCam.

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