



INTEGRATED MEDIA SYSTEMS CENTER
A National Science Foundation
Engineering Research Center at the
UNIVERSITY OF SOUTHERN CALIFORNIA

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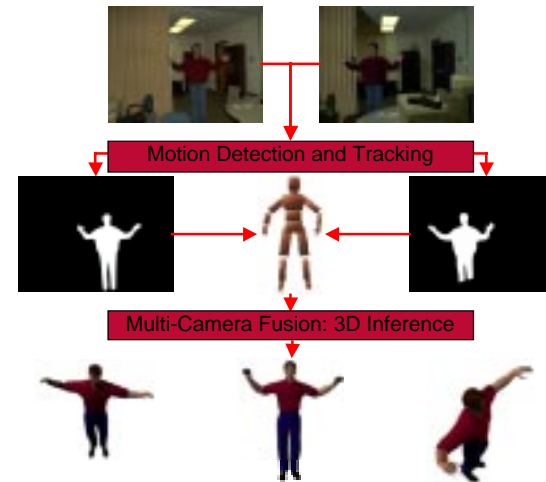
OTHER USC RESEARCHERS

Gerard Medioni
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3D human body reconstruction for Vision-based Perceptual User Interfaces



USC STUDENTS, DEGREES

Mun Wai Lee (PhD student), Hongxia Lee (PhD student)

BRIEF DESCRIPTION OF DEMONSTRATION

A real time 3D human body reconstruction is performed from couple of synchronized cameras. The system uses back-projected Infrared lights for an accurate detection of the people within the field of view. Silhouettes of the detected regions are extracted and registered allowing a 3D reconstruction of the human body using Generalized Cylinders.

An articulated body model is fitted to the 3D data and tracked over time using a particle filtering method (only pre-recorded results)

UNIQUE OR DISTINGUISHING CHARACTERISTICS RELATIVE TO STATE-OF-THE-ART

- Multi-view silhouettes-based reconstruction of human body using back-projected Infra-red light
- Automatic initialization of the articulated model

APPLICATIONS <ul style="list-style-type: none"> • Immersive Training • Mission Rehearsal Environment (ICT) • Vision-based Perceptual User Interfaces • Human Motion Capture 	RECENT HIGHLIGHTS, LEVEL OF DEVELOPMENT, UPCOMING MILESTONES <ul style="list-style-type: none"> • Real-time silhouettes-based 3D reconstruction of the human body • Recent: Particle filtering-based tracking of the human body • Future: Improved particle-filtering model, Gesture recognition
UNDERLYING TECHNOLOGIES <ul style="list-style-type: none"> • Detection of moving objects in a scene using background modeling • Shape from silhouettes • Shape description using generalized-cylinders • Particle filtering for tracking articulated body model 	
LIST OF PUBLICATIONS, REFERENCES, URLs <ul style="list-style-type: none"> • I. Cohen, G. Medioni and H. Gu. Inference of 3D human body posture from multiple cameras for vision-based user interfaces, 5th World Multi-Conference on Systemics, Cybernetics and Informatics, 2001, Orlando Florida • I. Cohen, Mun Wai Lee. 3D. Body Reconstruction for Immersive Interaction, Workshop on articulated motion and deformable objects, Palma de Mallorca, November 2002. 	

For additional information, please contact the Principal Investigator listed above via email, or contact

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