



INTEGRATED MEDIA SYSTEMS CENTER

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Engineering Research Center at the
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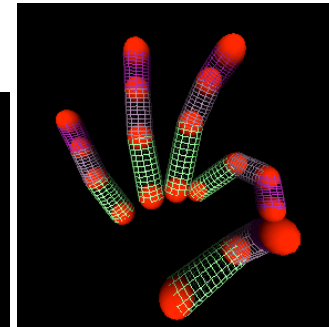
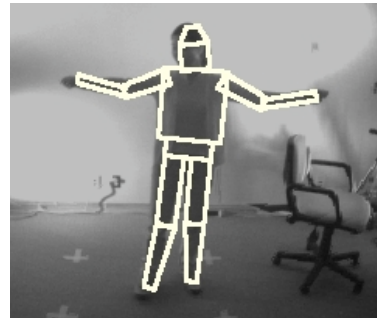
BRIEF DESCRIPTION OF DEMONSTRATION

Modeling the human body using articulated shape models constitutes a robust approach for tracking body motion from a set of synchronized video streams. The approach is based on computer vision technique and does not require the use of visual or electromagnetic sensors allowing the user to freely and naturally interact with an information system. We focus on modeling the torso, head and limbs of the user as well as an accurate modeling of the hands. The articulated models are fitted and tracked to the visual properties of the body shape using Particle Filtering (PF) techniques. It allows the system to robustly track non linear motions commonly observed in body motions.

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

- Efficient Particle Filtering technique based on analytical inference. It reduces the complexity of the PF and increases its efficiency by guiding the sampling process
- Efficient handling of body parts self-occlusions
- Automatic initialization of the articulated model

3D Body Modeling



Articulated models for the body and the hand

<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Motion Capture • Computer Aided Training • Virtual prototyping • Perceptual User Interface, Attentive User Interface 	<p>RECENT HIGHLIGHTS, LEVEL OF DEVELOPMENT, UPCOMING MILESTONES</p> <ul style="list-style-type: none"> • Hand and body modeling with adaptation of the model to the body proportions • Use of motion cue for accurate tracking • Future: Real-time performances, Gesture-based interaction, Multiple people
<p>UNDERLYING TECHNOLOGIES</p> <ul style="list-style-type: none"> • Particle filtering for fitting and tracking articulated model to body parts • Analytical inference for efficient particle sampling • Large number of degree of freedom for shape variations and tracking body joints 	
<p>LIST OF PUBLICATIONS, REFERENCES, URLs</p> <ul style="list-style-type: none"> • Mun Wai Lee, Isaac Cohen, Soon Li. “Particle Filter with analytical inference for human body tracking”, IEEE Workshop on Motion and Video Computing, Orlando, Florida. 5-6 December, 2002. • Isaac Cohen, Mun Wai Lee, “3D Body Reconstruction for Immersive Interaction”, Second International Workshop on Articulated Motion and Deformable Objects Palma de Mallorca, Spain, 21-23 November, 2002. • Isaac Cohen, Mun Wai Lee and Hongxia Li. “3D Body Reconstruction for Immersive Interaction”, Second International Workshop on Articulated Motion and Deformable Objects Palma de Mallorca, Spain, 21-23 November, 2002. 	

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