

Vision-Based Hand Gesture Tracking and Recognition

Dr. Thomas S. Huang

University of Illinois at Urbana-Champaign

We shall present some results of our research on hand tracking and gesture recognition in the last decade. This research is motivated by applications in human-computer interaction such as display control in virtual environments and the manipulation of virtual objects. Although we have studied both Appearance-Based and 3D Model-Based approaches, this talk will concentrate on the latter.

At any given time instant, the hand configuration - 6 parameters for the global hand "pose" and 21 finger joint angles (the hand "posture") - is a point in the 27-dimensional configuration space. We track the trajectory of this point over time using a 3D model-based and analysis-by-synthesis approach. The challenge is to represent the constraints on hand posture and finger movement in a compact way and use this representation to speed up the search in the 21-dimensional space. The tracking results can then be used to do gesture recognition. Some results will be shown on constraint representation and its use in tracking.

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Cape Florida Ballroom, Student Union

<http://www.cs.ucf.edu/~vision>

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BIOGRAPHY

Thomas S. Huang received his B.S. Degree in Electrical Engineering from National Taiwan University, Taipei, Taiwan, China; and his M.S. and Sc.D. Degrees in Electrical Engineering from MIT. He was on the Faculty of the Department of Electrical Engineering at MIT from 1963 to 1973; and on the Faculty of the School of Electrical Engineering and Director of its Laboratory for Information and Signal Processing at Purdue University from 1973 to 1980. In 1980, he joined the University of Illinois at Urbana-Champaign, where he is now William L. Everitt Distinguished Professor of Electrical and Computer Engineering, and Research Professor at the Coordinated Science Laboratory, and Head of the Image Formation and Processing Group at the Beckman Institute for Advanced Science and Technology and Co-Chair of the Institute's major research theme Human Computer Intelligent Interaction.

Dr. Huang's professional interests lie in the broad area of information technology, especially the transmission and processing of multidimensional signals.