The world as Metaphor: Computer Vision in Support Situated Interfaces and Human-Computer Interaction

How will we interact with our computing environments in ten years? What are the appropriate metaphors of interaction that will allow our computational environments to support our cognitive tasks? Current models of technological progress have certainly held true for most aspects of computing. However, human-computer interaction and display technologies have been remarkably static. If the past is to be any indicator of the future, users will continue to access their computers via the same basic keyboard, mouse and monitor introduced in 1980. Our cognitive worlds will remain distinct from our computational artifacts. I would like to suggest that these metaphors can and should be dramatically changed.

This talk will discuss how recent progress in computer vision, sensor networks, and large-format display may lead to a dramatic change in how users interact with computers in their daily lives. I will outline many of the challenges and fundamental computer vision problems I am addressing related to this theme. In particular, I will discuss recent progress in multi-camera tracking of subjects over wide-areas, multi-camera predictive models of behavior, and behavior recognition. I will demonstrate several novel human-computer interaction systems that we are building as part of the Terrascope project. These systems allow us to explore how vision techniques in cooperation with digital light projectors can free the user from the constraints of the keyboard and monitor and support intuitive interaction with digital information in our natural environment.