Plenary Talk
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Virtual Vision: Simulating Camera Networks in Virtual Reality for Surveillance System Design and Evaluation

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ABSTRACT

I review my research with Faisal Qureshi towards smart camera networks capable of carrying out advanced surveillance tasks with little or no human supervision. A unique centerpiece of our work is the combination of computer vision, computer graphics, and artificial life simulation technologies to develop such networks and experiment with them. Our prototype simulator has enabled us to readily develop and experiment with smart camera networks comprising static and active simulated video surveillance cameras that provide extensive coverage of a large virtual public space, a train station populated by autonomously self animating virtual pedestrians. The simulated networks of smart cameras perform persistent visual surveillance of individual pedestrians with minimal intervention. Our Virtual Vision simulator has been a potent tool in our quest for innovative camera control strategies that naturally address camera aggregation and handoff, are robust against camera and communication failures, and require no camera calibration, detailed world model, or central controller.

BIOGRAPHY

Demetri Terzopoulos (PhD '84 MIT) is the Chancellor's Professor of Computer Science at the University of California, Los Angeles. He is also affiliated with the University of Toronto as a professor in the departments of Computer Science and Electrical & Computer Engineering. He is a Guggenheim Fellow, a Fellow of the ACM, a Fellow of the IEEE, a Fellow of the Royal Society of Canada, and a Member of the European Academy of Sciences. His many awards and honors include an Academy Award for Technical Achievement from the Academy of Motion Picture Arts and Sciences for his pioneering work on physics-based computer animation, and the inaugural Computer Vision Significant Researcher Award from the IEEE for his pioneering and sustained research on deformable models and their applications. He has published more than 300 research papers and several volumes, primarily in computer graphics, computer vision, medical imaging, computer-aided design, and artificial intelligence/life.

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