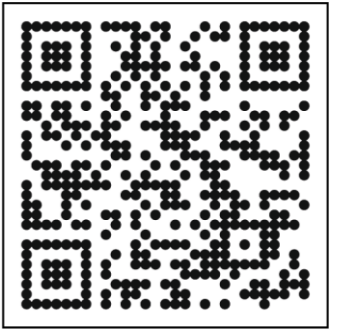




北京大学前沿计算研究中心
Center on Frontiers of Computing Studies, Peking University

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CFCS 杰出讲座系列 Distinguished Lecture Series

Biomimetic Human Simulation and the Deep Learning of Neuromuscular and Sensorimotor Control



Prof. Demetri Terzopoulos
University of California, Los Angeles

🎤 Host: 陈宝权 教授

🕒 2019年7月13日 星期六 10:00-11:00

📍 北京大学静园五院204



Abstract

Anthropomorphic animation departs from conventional human animation in that it strives for realism by taking advantage of increasingly accurate simulation of the anatomical structures of the human body, not just the bones, joints, and muscles, but also the human sensory organs and, of course, the brain. In this context, I will present a strongly biomimetic framework for automatic human sensorimotor control. It features a biomechanically simulated human musculoskeletal model actuated by numerous muscles, with functional eyes whose retinas have many nonuniformly distributed photoreceptors. Our virtual human's sensorimotor control system, which comprises a neuromuscular motor subsystem driven by a visual sensory subsystem, includes two dozen (deep) neural networks. By synthesizing its own training data, our virtual human automatically learns efficient, online, active visuomotor control of its eyes, head, torso, and limbs in order to perform a variety of nontrivial sensorimotor tasks.

Biography

Demetri Terzopoulos is a Chancellor's Professor of Computer Science at the University of California, Los Angeles, where he holds the rank of Distinguished Professor and directs the UCLA Computer Graphics & Vision Laboratory. He is also Co-Founder and Chief Scientist of VoxelCloud, Inc., a multinational company that applies artificial intelligence to healthcare. He graduated from McGill University, received his PhD degree ('84) in Artificial Intelligence from the Massachusetts Institute of Technology (MIT), and remained a Research Scientist at the MIT Artificial Intelligence Laboratory through 1985. He is or was a Guggenheim Fellow, a Fellow of the ACM, a Fellow of the IEEE, a Fellow of the Royal Society of London, a Fellow of the Royal Society of Canada, a member of the European Academy of Sciences and the New York Academy of Sciences, and a life member of Sigma Xi. His many awards 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 Distinguished Researcher Award from the IEEE for his pioneering and sustained research on deformable models and their applications. The ISI and other indexes list him among the most highly-cited authors in engineering and computer science, with more than 400 published research papers and several volumes, primarily in computer graphics, computer vision, medical imaging, computer-aided design, and artificial intelligence/life. He has given approximately 500 invited talks around the world about his research, including well over 100 distinguished lectures and keynote/plenary addresses. He joined UCLA in 2005 from New York University, where he held the Henry and Lucy Moses Professorship in Science and was Professor of Computer Science and Mathematics at NYU's Courant Institute of Mathematical Sciences.

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