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Autonomous Motion Planning for Humanoid Robots

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ABSTRACT OF THE TALK

One of the grand challenges in artificial intelligence is to create autonomous humanoid robots. The anthropomorphic shape of a humanoid should enable operation in environments designed for humans, the utilization of human tools and interfaces, and the natural use of human gestures and non-verbal communication. Fundamentally, an intelligent humanoid should be a truly "general-purpose" robot, able to accomplish any task a real human can.

This talk will discuss the challenge of motion autonomy for humanoid robots and present an overview of several autonomous motion planning methods designed for application tasks involving navigation, object grasping and manipulation, footstep placement, and full-body motions.

Experimental results on several humanoid platforms around the world will be shown, along with some new efforts in "mobile manipulation".

Finally, the long-term prospects for the future development of robot autonomy and search-based AI will be discussed.

James Kuffner is an Associate Professor at the Robotics Institute, Carnegie Mellon University. He received a B.S. and M.S. in Computer Science from Stanford University in 1993 and 1995, and a Ph.D. from the Stanford University Dept. of Computer Science Robotics Laboratory in 1999. He spent two years as a Japan Society for the Promotion of Science (JSPS) Postdoctoral Research Fellow at the University of Tokyo working on software and planning algorithms for humanoid robots. He joined the faculty at Carnegie Mellon University's Robotics Institute in 2002. He has published over 100 technical papers and received the Okawa Foundation Award for Young Researchers in 2007.