



SCHOOL OF COMPUTER SCIENCE

Special Lecture

Aaron Dollar
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"Mechanical Intelligence" in Robotic Manipulation: Towards Human-level Dexterity in Robotic and Prosthetic Hands

The human hand is the pinnacle of dexterity - it has the ability to powerfully grasp a wide range of object sizes and shapes as well as delicately manipulate objects held within the fingertips. Current robotic and prosthetic systems, however, have only a fraction of that manual dexterity. My group attempts to address this gap in two main ways: the mechanical design of effective hands and the study of human hand function and use as inspiration and performance benchmarking. In terms of hand design, we strongly prioritize passive mechanics, including incorporating adaptive underactuated transmissions and carefully tuned compliance, and seek to maximize open-loop performance while minimizing complexity. To motivate and benchmark our efforts, we are examining human hand usage during daily activities as well as quantifying functional aspects such as precision manipulation workspaces. Besides describing these efforts, I will touch on other work in the lab related to legged robots, novel fabrication techniques, modular robots, and the study of non-human "hands".



Bio:

Aaron Dollar is the John J. Lee Associate Professor of Mechanical Engineering and Materials Science at Yale and is currently a Visiting Professor in the Department of Ecology and Evolutionary Biology at Brown. He earned a B.S. in Mechanical Engineering at UMass Amherst, S.M. and Ph.D. degrees in Engineering Science at Harvard, and was a postdoctoral associate at MIT in Health Sciences and Technology and the Media Lab. Prof. Dollar is the recipient of a number of awards, including young investigator awards from AFOSR, DARPA, NASA, and NSF, and is the founder of the IEEE Robotics and Automation Society Technical Committee on Mechanisms and Design and open-source teaching and research repositories RoboticsCourseWare.org and OpenRobotHardware.org.

Tuesday, March 31
1 PM GHC 6115

Host: Siddhartha Srinivasa
For Appointments: Kimm Mills