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## Research Talk: Aaron Dollar, Yale University

### "Reengineering the Hand: 'Mechanical Intelligence' in Robotic Manipulation"

*Thursday, December 4, 2014*  
12:00 – 1:00pm  
CIT Building, Room 368

Despite decades of research, current robotic systems are unable to reliably grasp and manipulate a wide range of unstructured objects in human environments. The somewhat traditional approach of attempting to copy the immense mechanical complexity of the human hand in a stiff “robotic” mechanism, and the subsequently required levels of sensing and control, has not yet been successful. Alternatively, with careful attention to the design of the mechanics of hands, including adaptive underactuated transmissions and carefully tuned compliance, we have been able to achieve a level of dexterity and reliability as yet unseen in the robotics community. I will describe ongoing efforts to further develop grasping and dexterous manipulation capabilities in engineered systems as well as describe some of our other work in robot design and fabrication techniques.

**Aaron Dollar** is the John J. Lee Associate Professor of Mechanical Engineering and Materials Science at Yale University 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 the University of Massachusetts at Amherst, S.M. and Ph.D. degrees in Engineering Science at Harvard University, and was a postdoctoral associate at MIT in Health Sciences and Technology and the Media Lab. He directs the Yale GRAB Lab, which conducts research into robotic hands and dexterous manipulation, prosthetics, and assistive and rehabilitation devices. Prof. Dollar is the recipient of a number of awards, including young investigator awards from NASA, DARPA, the Air Force Office of Scientific Research, and the National Science Foundation.

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