“Understanding Human Hand Use to Motivate Design of Low-Dimensional Mechanical Hands”

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Despite decades of research, current robotic systems are unable to reliably grasp and manipulate a wide range of unstructured objects in human environments. Traditional approaches attempt to copy the immense mechanical complexity of the human hand in a stiff “robotic” mechanism along with complicated sensing and control schemes. Alternatively, by careful inclusion of adaptive underactuated transmissions and tuned compliance, we have been able to achieve a level of dexterity and reliability as yet unseen in the robotics community. I will describe our ongoing efforts to study human grasping and manipulation during the activities of daily living as well as work towards developing robust, open-loop grasping and dexterous manipulation capabilities in engineered systems including robotics, prosthetics, and small aerial vehicles.