

16-848 Reference List for Jan 15

We looked at two main references today. The first of these has a comprehensive listing of robot and prosthetic hands developed over more than a century, and includes definitions of different types of joints, types of actuation, and transmission architectures. Supplemental Table 1 (second link below) includes a list of hands and various features of each of those hands.

Piazza, C., G. Grioli, M. G. Catalano, and A. Bicchi. "A century of robotic hands." *Annual Review of Control, Robotics, and Autonomous Systems* 2 (2019): 1-32.

<https://www.annualreviews.org/doi/pdf/10.1146/annurev-control-060117-105003>

https://www.annualreviews.org/doi/suppl/10.1146/annurev-control-060117-105003/suppl_file/as02_bicchi_suptable1.pdf

The second paper that we reviewed describes the JamHand, and serves as a case study to raise the question of what makes a hand dexterous. How do we evaluate hand dexterity? How do we express what a given hand can do well and what it cannot? The authors evaluate this hand using pull out force and by demonstrating a collection of grasps and manipulation actions from the benchmarking literature. The supplementary video was a little hard to find, so I include its link below.

Amend, John, and Hod Lipson. "The JamHand: Dexterous manipulation with minimal actuation." *Soft robotics* 4, no. 1 (2017): 70-80.

<https://www.liebertpub.com/doi/full/10.1089/soro.2016.0037>

https://www.liebertpub.com/doi/suppl/10.1089/soro.2016.0037/suppl_file/Supp_Video1.zip