

# Characterizing Physical Interaction in Instrument Manipulations

NSF Grant No. 1560761

Yu Sun

Computer Science and Engineering

University of South Florida



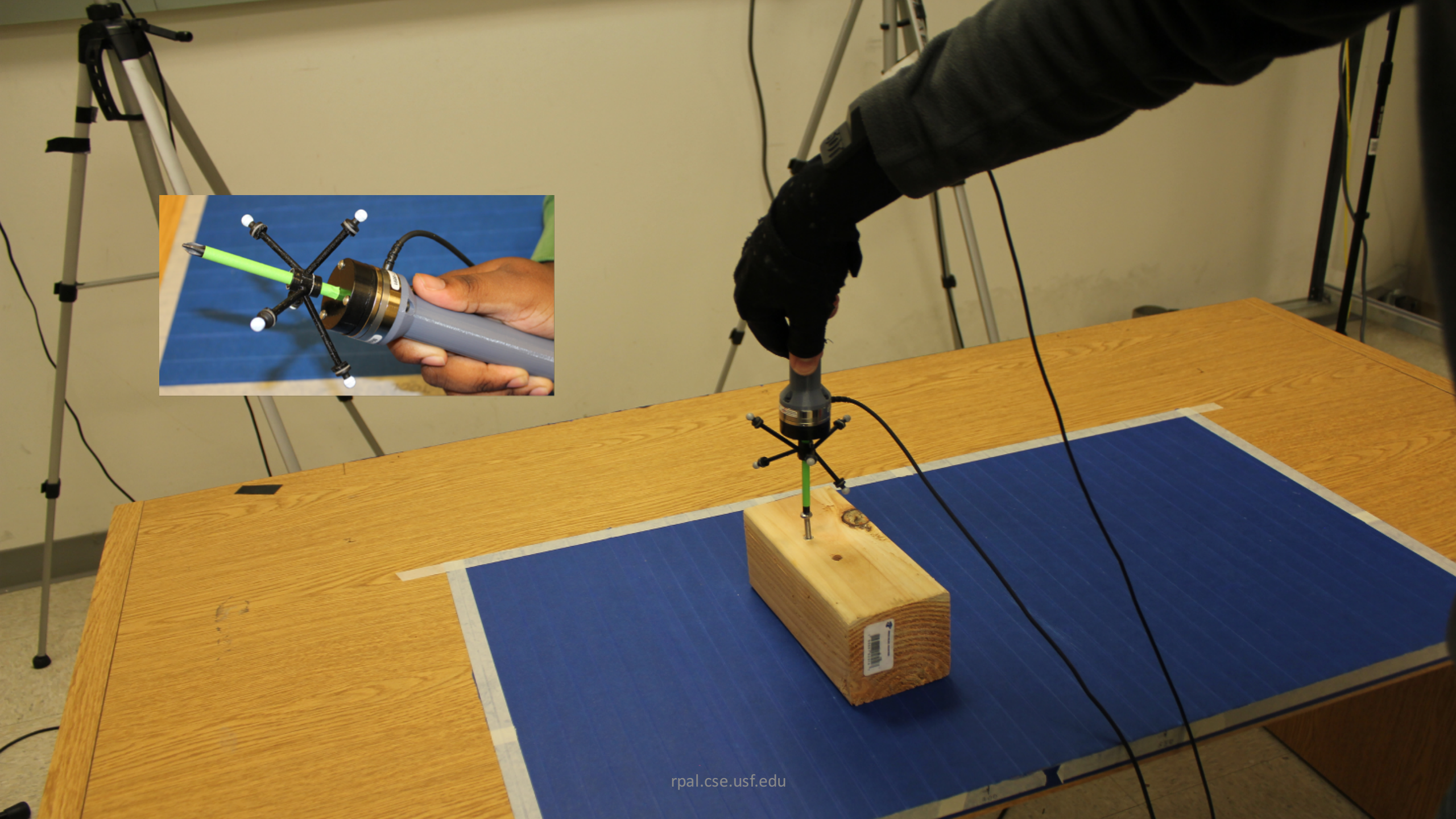
Poster 29-F-L







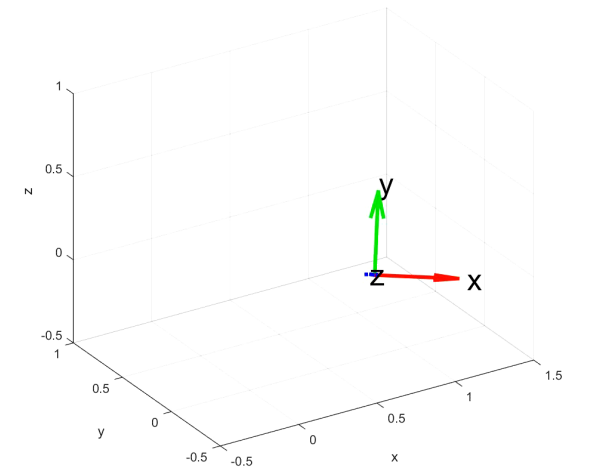
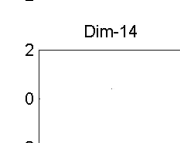
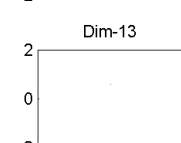
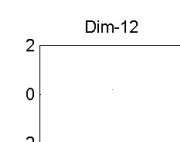
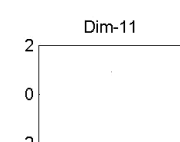
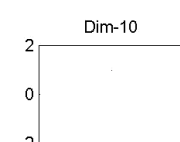
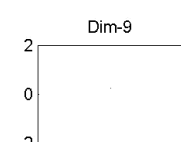
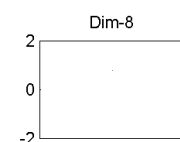
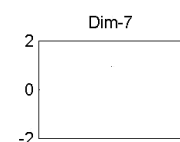
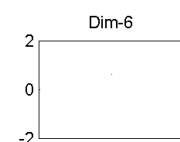
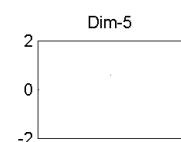
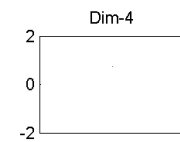
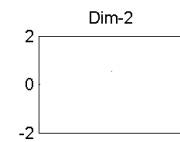
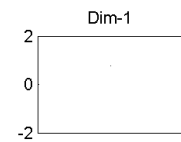
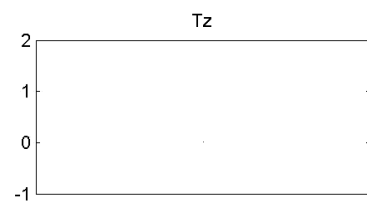
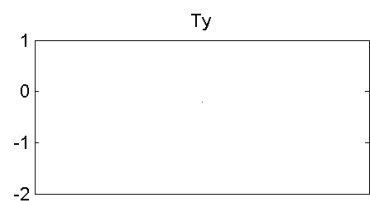
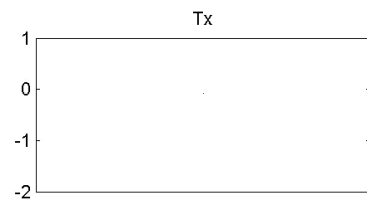
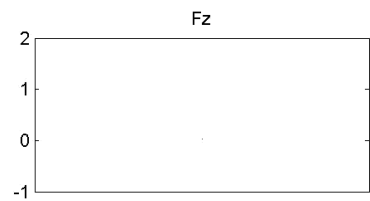
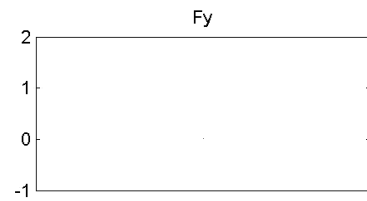
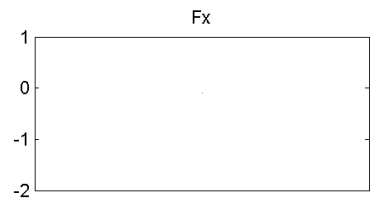
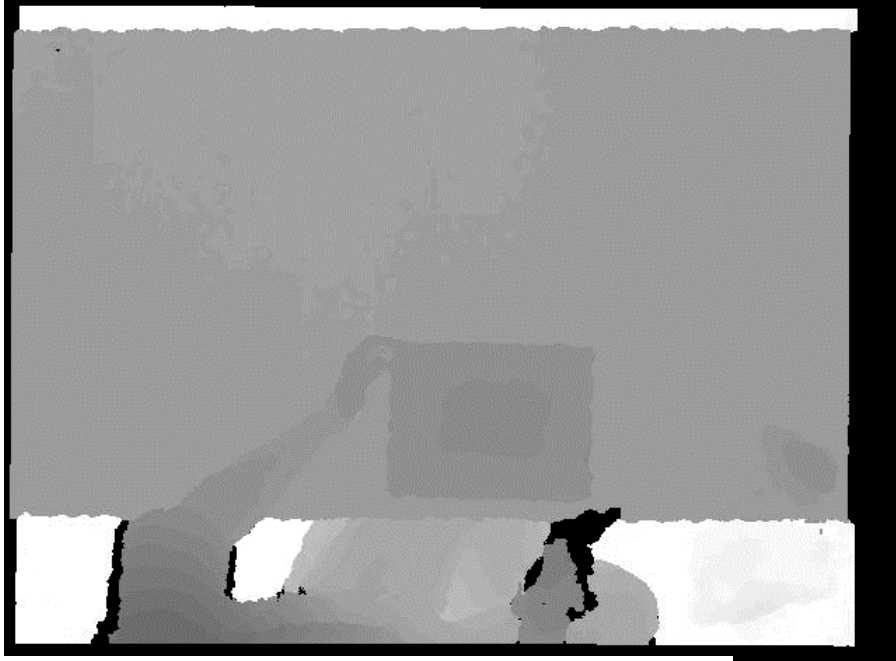










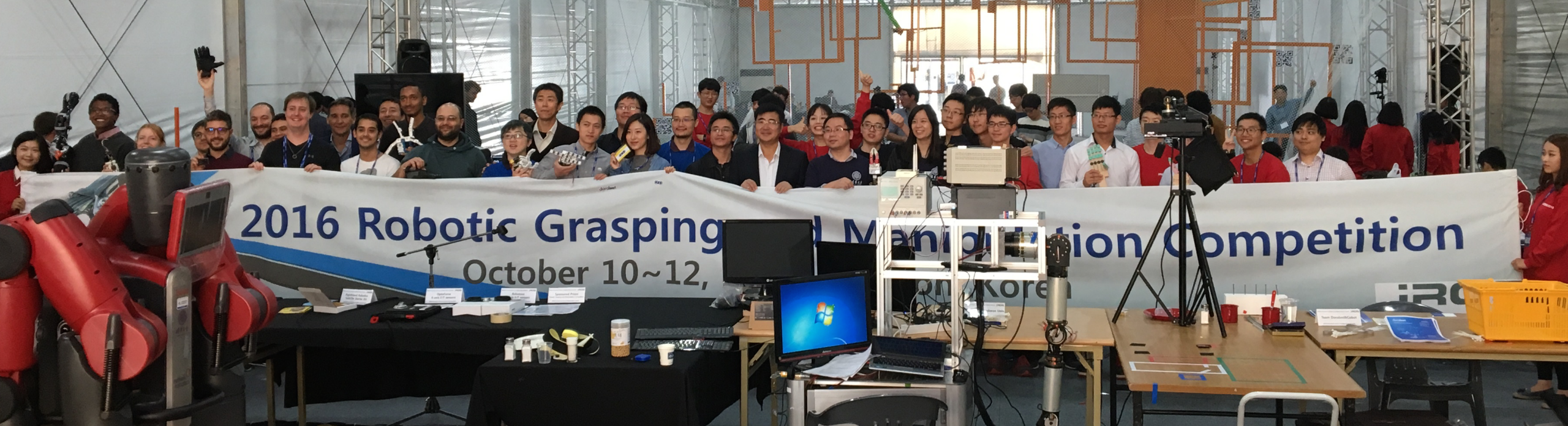




# Instrumental ADLs

- Food preparation
- Basic house maintenance
- Basic housework
- Personal hygiene
- Total: 36 manipulation tasks, around 3000 manipulations







# References

1. Lin, Y. and Sun, Y., 2016. Task-oriented grasp planning based on disturbance distribution. In *Robotics Research* (pp. 577-592). Springer International Publishing.
2. Sun, Y., Yun Lin, and Yongqiang Huang (2016) *Robotic Grasping for Instrument Manipulations*, URAI, 1-3
3. Paulius, D. Huang, Y., Milton, R., Buchanan, W.D., Sam J., and Sun, Y. (2016) *Functional Object-Oriented Network for Manipulation Learning*, IROS, 3655-3662
4. Huang, Y. and Sun, Y. (2015) *Generating Manipulation Trajectories Using Motion Harmonics*, IROS, 4949-4954.
5. Lin, Y. and Sun, Y. (2015) *Task-Based Grasp Quality Measures for Grasp Synthesis*, IROS, 485-490.
6. Lin, Y. and Sun, Y., (2015) *Grasp Planning to Maximize Task Coverage*, Intl. Journal of Robotics Research, 34(9): 1195-1210.
7. Lin, Y., and Sun, Y. (2015) *Robot Grasp Planning Based on Demonstrated Grasp Strategies*, Intl. Journal of Robotics Research, 34(1): 26-42.
8. Sun, Y., and Y. Lin. *Modeling Paired Objects and Their Interaction.*" In *New Development in Robot Vision*, pp. 73-87. Springer Berlin Heidelberg, 2015.
9. Sun, Y., Ren, S., and Lin, Y. (2014) *Object-Object Interaction Affordance Learning*, *Robotics and Autonomous Systems*, 62(4), 487-496
10. Lin, Y., Sun, Y. (2014) *Grasp Planning Based on Grasp Strategy Extraction from Demonstration*, IROS, pp. 4458-4463.
11. Dai, W., Sun, Y., Qian, X., (2013) *Functional Analysis of Grasping Motion*, IROS, pp. 3507-3513.
12. Christine Bringes, Yun Lin, Yu Sun, Redwan Alqasemi (2013) *Determining the Benefit of Human Input in Human-in-the-Loop Robotic Systems*, IEEE ROMAN 2013, pp. 1-8.
13. Ren S., Sun Y. (2013) *Human-Object-Object-Interaction Affordance*, IEEE Workshop in Robot Vision (WoRV)/Winter Vision Meeting (WVM), pp. 1-6, 2013
14. Lin Y., Sun Y. (2013) *Grasp Mapping Using Locality Preserving Projections and KNN Regression*, IEEE Intl. Conference on Robotics and Automation, pp 1068-1073
15. Lin Y., Ren S., Clevenger M., and Sun Y. (2012) *Learning Grasping Force from Demonstration*, IEEE Intl. Conference on Robotics and Automation, pp. 1526-1531.
16. Lin Y, Sun Y (2011) *5-D Force Control System for Fingernail Imaging Calibration*, IEEE Intl. Conference on Robotics and Automation, pp. 1374-1379
17. Sun Y (2011) *Fingertip Force and Contact Position and Orientation Sensor*, IEEE Intl. Conference on Robotics and Automation, pp. 1114-1119