

RSS 2007 Manipulation Workshop: Sensing and Adapting to the Real World

When and Where

Saturday, June 30th, 2007 in room 2443 on the 2nd floor of the [Klaus Building](#), which is [building 153](#) on the Georgia Tech campus.

Preliminary Schedule

9:00-9:05	Welcome from the organizers
Tactile Sensing	
9:05-9:30	Touch Based Perception for Object Manipulation (pdf) Anna Petrovskaya, Oussama Khatib, Sebastian Thrun, and Andrew Y. Ng
9:30-9:55	An Experiment in the Use of Manipulation Primitives and Tactile Perception for Reactive Grasping (pdf) Antonio Morales, Mario Prats, Pedro Sanz, and Angel P. Pobil
9:55-10:20	Grasping POMDPs: Theory and Experiments (pdf) Ross Glashan, Kaijen Hsiao, Leslie Pack Kaelbling, and Tomás Lozano-Pérez
10:20-11:10	Poster and demo session #1 (refreshments from 10:30-10:45) <ol style="list-style-type: none"> 1. Tactile Sensing Arrays for Humanoid Robots (poster) (paper) <i>Ravinder S. Dahiya, Maurizio Valle, Giorgio Metta, and Leandro Lorenzelli</i> 2. Guiding Grasping with Proprioception and Markov Models (pdf) <i>Peter Deckers, Aaron M. Dollar, and Robert D. Howe</i> 3. A Switching Control Approach to Haptic Exploration for Quality Grasps (pdf) <i>Di Wang, Brian T. Watson, and Andrew H. Fagg</i> 4. Optimal Reaching and Balancing for Humanoid Robots (pdf) <i>Juyong Park, Bokman Lim, Jaeyoung Haan, and F.C. Park</i> 5. A Framework for Visually Guided Haptic Exploration with Five Finger Hands (pdf) <i>A. Bierbaum, K. Welke, D. Burger, T. Asfour, and R. Dillmann</i>
11:10-11:30	Discussion on tactile sensing Topics may include: <ol style="list-style-type: none"> 1. How much can be achieved with tactile sensing, and what are its limits? 2. How can tactile sensing best be integrated with control? 3. What are the main challenges in tactile sensing for manipulation? 4. What are the advantages and disadvantages with respect to other forms

	of sensing? 5. For what real-world applications is this modality best suited?
Low-dimensional Control	
11:30-11:55	2D Subspaces for User-Driven Robot Grasping (pdf) Aggeliki Tsoli and Odest Chadwicke Jenkins
11:55-12:20	Dexterous Grasping via Eigengrasps: A Low-dimensional Approach to a High-complexity Problem (pdf) Matei Ciocarlie, Corey Goldfeder, and Peter Allen
12:20-12:30	Discussion on low dimensional control Topics may include: 1. How can sensing and low dimensional control complement one another? 2. What real-world manipulation tasks could be performed with low dimensional control? 3. Are there inherently complex manipulation tasks? 4. How should task complexity be characterized?
12:30-2:00	Lunch
2:00-2:05	Welcome back and introduction
2:05-2:35	Keynote: Andrew Ng
2:35-3:30	Poster and demo session #2 (refreshments from 2:45-3:00) <ol style="list-style-type: none"> 1. Learning Behavior-Grounded Tool Affordances with Generalization Across Different Tools (pdf) <i>Jivko Sinapov and Alexander Stoytchev</i> 2. A New Mobile Manipulation Platform for Automatic Coffee Retrieval (pdf) <i>Cressel Anderson, Ben Axelrod, J. Philip Case, Jaeil Choi, Martin Engel, Gaurav Gupta, Florian Hecht, John Hutchison, Niyant Krishnamurthi, Jin Han Lee, Hai Dai Nguyen, Richard Roberts, John G. Rogers, and Alexander J. B. Trevor</i> 3. Learning Robot Soccer from Demonstration: Ball Grasping (pdf) <i>Daniel H. Grollman and Odest Chadwicke Jenkins</i> 4. Hierarchical Integration of Local 3D Features for Probabilistic Pose Recovery (pdf) <i>Renaud Detry and Justus Piater</i> 5. Demo: Human Robot Interfaces for Mobile Manipulators (pdf) <i>Patrick Deegan, Ed Hannigan, Bryan Thibodeau, and Roderic Grupen</i> 6. Demo: Two Safety Solutions Specific to Service Manipulators (pdf) <i>William Townsend</i>

	<p>7. Demo: Precise Target Localization in a Changing Pick & Place Environment (pdf) <i>Tino Perucchi and Hansruedi Fröh</i></p> <p>8. Demo: The Shadow Hand (pdf) <i>Armando De La Rosa</i></p>
Visual Sensing	
3:30-3:55	<p>A Framework for Door Localization and Door Opening Using a Computer Controlled Wheelchair for People Living with Mobility Impairments (pdf) Alexander Andreopoulos and John K. Tsotsos</p>
3:55-4:20	<p>Extracting Planar Kinematic Models Using Interactive Perception (pdf) Dov Katz and Oliver Brock</p>
4:20-4:45	<p>Haptically Guided Teleoperation for Learning Manipulation Tasks (pdf) Ayanna M. Howard and Chung Hyuk Park</p>
4:45-5:00	<p>Discussion on visual sensing Topics may include:</p> <ol style="list-style-type: none"> 1. In what ways is vision for manipulation a distinct area of research relative to areas emphasized by the computer vision community? 2. What are the main challenges in visual sensing for manipulation? 3. What are the advantages and disadvantages with respect to other forms of sensing? 4. For what applications is this modality best suited? 5. How can human-robot interaction (HRI) best support autonomous robots that sense and adapt to the real world?
The Future	
5:00-5:12 (flexible)	<p>Lightning talks (short talks \leq 4 minutes each, sign up during the day, time allotted will depend on demand and review by the organizers)</p>
5:12-5:40	<p>Discussion of future real-world applications of autonomous manipulation. Goals include:</p> <ol style="list-style-type: none"> 1. Create a list of promising applications. 2. Identify technical challenges impeding these applications. 3. Create a list of milestones for research in order to enable these applications.
5:40-6:00	<p>Planning Session for Next Year</p>