Editor's Note:
It is my pleasure to bring you the most recent newsletter of our technical committee. The newsletter is a brief snapshot of the ongoing projects and opportunities in our area. If you would like your announcement to appear in the next newsletter, simply send me an email (dberenson@cs.wpi.edu). Thanks to all the contributors!

Technical Committee on Mobile Manipulation Newsletter (April 2013)

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1. NEW ROBOT VIDEOS

--PR2 unlatching and pushing a door open to learn its dynamic behavior from laser perception. The door's geometry is assumed to be known.
http://youtu.be/N7tPAM2nLdU

--This Video shows the OmniRob swinging a door open and passing through. The door's geometry is assumed to be known, but the friction and moment of inertia is learned during the manipulation.
http://youtu.be/j7gbYNMU4LE
(from Felix Endres)

--OmniRob with LWR using force sensors and laser perception to estimate the door dynamics (moment of inertia, center of rotation, friction) within the first interaction. It then refines the model observing each new manipulation. Only the rough location of the door is assumed to be known.
http://youtu.be/4C2wErh8_iE
(from Felix Endres)

-- The IkeaBot system performing autonomous furniture assembly of an IKEA Lack table. http://www.youtube.com/watch?v=B9sYogRVF8Q
(from Ross Knepper)

--Kodiak the PR2 learns how to perceive and manipulate food items, which have complex material properties, through haptic interactions with such objects. The PR2 can make a salad!
http://www.youtube.com/watch?v=MqYOmPNwK0Y
(from Mevlana Gemici)

--We show that a robot is able to detect and arrange objects in an unstructured human environment, with the help of hallucinating humans It first learns object affordances from 3D scene databases which do not require humans present. Then given a new environment, it samples reasonable human poses and object locations. In the end, the robot places objects in

their most likely locations to finish the scene arrangement. For more details, please visit http://pr.cs.cornell.edu/hallucinatinghumans/.
http://youtu.be/lJ7OcpY3GbA
(from Yun Jiang)

--Videos showing robots in the Morse simulator
http://vimeo.com/groups/blenderandrobotics.
(from Arnaud Degroote}

--Sequencing motion primitives to fold cloths. Examples of folding jeans, a t-shirt, and a large towel.
http://www.youtube.com/watch?v=MOtbcYE4Z4o
http://www.youtube.com/watch?v=MeBBVAKv5zI
http://www.youtube.com/watch?v=Xq33WIW-JtA
(from Dmitry Berenson)

--Archie (WPI's PR2 robot) drives to and manipulates a wheel as part of testing for the DARPA robotics challenge.
http://www.youtube.com/watch?v=xRcUO2mXt3s
(from Dmitry Berenson)

2. NEW PROJECT WEBSITES

--The IkeaBot system performs autonomous furniture assembly, with capabilities from geometric and symbolic planning to manipulation and multi-robot coordination. It also includes a custom, modular tool system designed to enhance the capabilities of a stock KUKA youBot.
http://people.csail.mit.edu/rak/www/?q=node/20
(from Ross Knepper)

--We developed the PneuFlex toolkit in order to to explore complex human like grasp strategies. What is often considered to be a complicating constraint, such a table surface, humans actually often exploit during grasping. High quality compliance and the ability to safely collide with surfaces are necessary preconditions. The PneuFlex actuator marries those properties with customizability and very low costs per DoF. The latter removes the scarcity of potential concurrent contact points, and we can devise simple mechanical heuristics to avoid explicit contact point planning and expensive degrees of actuation. We also open-sourced and documented our manufacturing process to create an accessible foundation for other interested researchers to build upon.
http://www.robotics.tu-berlin.de/index.php?id=pneuflex_tutorial
(from Raphael Deimel)

3. NEW CODE RELEASES

--A ROS stack developed during the PR2 beta project containing several tools related to door opening, e.g., for

-learning of the kinematics of a door from laser scans or visual
markers (door_perception),
-unlatching and pushing of a door with the PR2 (door_manipulation_tools),
-quickly teaching the robot a door's dynamic by demonstration (door_demonstration_tools).
http://ros.org/wiki/dynamic_door_manipulation
(from Felix Endres)

--The Morse team is pleased to announce the release of Morse 1.0. Morse is a free versatile simulator for robotics, able to cope with realistic indoor or outdoor scenarios, with one to over a dozen autonomous robots. Morse comes with a large number of robots (from ATRV, to PR2, via quadrotor, or realistic vehicle), sensors and actuators (including the kuka arm). Moreover, it is easy to integrate in your architecture, as it supports a large number of middlewares (including ROS and YARP). Last, it is easy to extend, both in a programmatic way with its use of Python, and in the modeling way, as it relies on the well-know Blender modeler.
http://morse.openrobots.org.
(from Arnaud Degroote)