Kaijen Hsiao
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Education:

Massachusetts Institute of Technology   NSF graduate fellow, GPA 5.0/5.0
Ph.D. in Computer Science, August 2009, Thesis: *Relatively Robust Grasping*
M.S. in Computer Science, January 2005, Thesis: *Imitation Learning of Whole-Body Grasps*
Advisors: Tomás Lozano-Pérez and Leslie Kaelbling

Princeton University   Graduated summa cum laude, GPA 3.8/4.0
B.S.E. in Mechanical Engineering, June 2002
Certificates (minors) in Robotics and Intelligent Systems and Applications of Computing

Experience:

Willow Garage, Menlo Park, CA. **Area Manager of Web Robotics Group** (May 2012-Aug. 2013)
      and **Research Scientist** (Nov. 2009-Aug. 2013)
- Managed/worked closely with a 12-person team to:
    - Create web interfaces, server/database infrastructure, and robot capabilities for teleoperation and end-user programming of the PR2, Turtlebot, and other robots (including open-source libraries released as part of the Robot Web Tools project)
    - Develop software for a novel mobile manipulation product, including improvements in localization, navigation, occupancy grid generation, intuitive user interfaces, vision-based docking, sonar-based obstacle avoidance, and kinematic/multi-sensor calibration
- Research in grasping, manipulation, and shared-autonomous teleoperation:
    - Created pipelines and algorithms for vision-based, autonomous manipulation
        - Grasp planning for novel/unknown objects (based on 3D point cloud data)
        - Dealing with clutter (through point cloud segmentation and push-grasping)
        - Dealing with uncertainty in shape and pose (using probabilistic methods)
        - Reactive grasp/force adjustment and slip detection (using tactile sensors)
    - Developed shared-autonomous teleoperation interfaces
        - Created assistive robotics interfaces that enable people with severe physical disabilities to use robots to interact with their environment (as part of the Robots for Humanity project), to do things such as: get items from drawers or the refrigerator, give out candy to trick-or-treaters, or flip light switches
        - Performed user studies to evaluate the efficacy/usability of various interfaces
    - Developed/architected much of the ROS (Robot Operating System) grasping and manipulation pipeline, used by multiple robots to do pick-and-place tasks
    - Mentored 15 interns, resulting in 20 published papers and lots of open-source code

MIT Computer Science and Artificial Intelligence Lab, Cambridge, MA, 2002-2009.
- PhD thesis on robotic grasping under object pose uncertainty, in which forward-search through belief space (using a POMDP model) is used to select among information-gathering, reorientation, and goal grasps, while robustly executing specific grasps (on objects such as Brita pitchers and power drills) with a Barrett WAM

- MS thesis research on Imitation Learning of Whole-Body Grasps, in which demonstrated grasps are adapted to work on new objects classified as being similar to the original, using a simulated humanoid robot

Willow Garage/Stanford University, Menlo Park/Palo Alto, CA, Summer 2008. Summer intern.
- Worked in Andrew Ng's group at Stanford on reactive grasp adjustment with IR fingertip proximity sensors mounted on a Barrett WAM (as part of the STAIR project)

Iguana Robotics, Urbana-Champaign, IL, Summer 2002. Summer Intern
- Worked on networking, programming, and circuit design for a bipedal walking robot
- Wrote software for the Color Taster, a device that uses neural networks for color classification

MIT Media Lab, Cambridge, MA, Responsive Environments Group, Summers of 2001 and 1999
- Programmed a DSP in assembly to do signal processing for the 'Responsive Window' (a window tap-tracker that uses microphones to find tap locations), under Dr. Joseph Paradiso.
- Developed software for the 'Expressive Footwear' project (sensor-laden musical shoes)

iRobot Corporation, Cambridge, MA, Summer 2000
- Summer Intern - assisted in prototyping components such as chargers and test fixtures, and quoting parts for the iRobot (a mobile, web-teleoperated home robot) mechanical design team.

Selected Publications:
Google scholar profile: http://tinyurl.com/krbb9ag (510 citations as of August 2013)

"Strategies for Human-in-the-Loop Robotic Grasping," Adam Leeper, Kaijen Hsiao, Matei Ciocarlie, Leila Takayama, David Gossow, HRI 2012.

"Robust Grasping Under Object Pose Uncertainty," Kaijen Hsiao, Leslie Pack Kaelbling, and Tomás Lozano-Pérez, Autonomous Robots, Vol. 31, No. 2-3, 2011.

"Human-Inspired Robotic Grasp Control with Tactile Sensing," Joseph Romano, Kaijen Hsiao, Gunter Niemeyer, Sachin Chitta, and Katharine J.Kuchenbecker, IEEE Transactions on Robotics, Vol. 27, Issue 6, 2011.

"Contact-Reactive Grasping of Objects with Partial Shape Information," Kaijen Hsiao, Sachin Chitta, Matei Ciocarlie, and Gil E. Jones. IROS, 2010.

"Reactive Grasping Using Optical Proximity Sensors," Kaijen Hsiao, Paul Nangeroni, Manfred Huber, Ashutosh Saxena, and Andrew Ng., ICRA, 2009.

"Grasping POMDPs," Kaijen Hsiao and Leslie Pack Kaelbling and Tomás Lozano-Pérez. ICRA, 2007.

"Imitation Learning of Whole-Body Grasps," Kaijen Hsiao and Tomás Lozano-Pérez. IROS, 2006.

Computer and Other Skills:
Programming languages: Python, C/C++, some experience with JavaScript, Html, Perl, assembly
Tools/libraries: ROS, PCL, Gazebo, SciPy/NumPy, OpenCV, Matlab
Operating systems: Linux (particularly Ubuntu), Windows
Robots/platforms: PR2, Turtlebot, Barrett WAM, Arduino
Github profile: https://github.com/KaijenHsiao