

# Prof. Siddhartha Srinivasa

The Personal Robotics Lab  
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## (a) Professional Preparation

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Bachelor of Technology, Mechanical Engineering, Indian Institute of Technology Madras	August 1999
Master of Science, Robotics, Carnegie Mellon University	August 2001
Doctor of Philosophy, Robotics, Carnegie Mellon University	August 2005

## (b) Appointments

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Boeing Endowed Professor, School of Computer Science & Engineering, University of Washington	2017-Present
Finmeccanica Associate Professor, The Robotics Institute, Carnegie Mellon University	2011-2017
Senior Research Scientist, Intel Labs Pittsburgh	2005-2011

## (c-i) Five Most Relevant Products

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- [ 1 ] A.D. Dragan and S.S. Srinivasa. Integrating human observer inferences into robot motion planning. *Autonomous Robots*, 37(4):351–368, 2014
- [ 2 ] S. Nikolaidis, D. Hsu, and S.S. Srinivasa. Human-robot mutual adaptation in collaborative tasks: Models and experiments. *The International Journal of Robotics Research*, 36(5-7):618–634, 2017
- [ 3 ] K. Strabala, M.K. Lee, A.D. Dragan, J. Forlizzi, S.S. Srinivasa, M. Cakmak, and V. Micelli. Towards seamless human-robot handovers. *Journal of Human-Robot Interaction*, 2(1), 2013
- [ 4 ] M. Zucker, R. Ratliff, A.D. Dragan, M. Pivtoraiko, M. Klingensmith, C. Dellin, J.A. Bagnell, and S.S. Srinivasa. CHOMP: Covariant Hamiltonian Optimization for Motion Planning. *The International Journal of Robotics Research*, 32(9–10):1164–1193, 2013
- [ 5 ] A.D. Dragan and S.S. Srinivasa. A policy-blending formalism for shared control. *The International Journal of Robotics Research*, 32(7):790–805, 2013. (Conference version was **Best Conference Paper Award Finalist, RSS 2012**)

## (c-ii) Five Other Significant Products

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- [ 1 ] M.C. Koval, N.S. Pollard, and S.S. Srinivasa. Pre- and post-contact policy decomposition for planar contact manipulation under uncertainty. *The International Journal of Robotics Research*, 35(1–3):244–264, 2016
- [ 2 ] A. Collet, B. Xiong, C. Gurau, M. Hebert, and S.S. Srinivasa. HerbDisc: Towards lifelong robotic object discovery. *The International Journal of Robotics Research*, 34(1):3–25, 2015
- [ 3 ] R. Paolini, A. Rodriguez, S.S. Srinivasa, and M.T. Mason. A data-driven statistical framework for post-grasp manipulation. *The International Journal of Robotics Research*, 33(4):600–615, 2014
- [ 4 ] A.D. Dragan, K.T. Lee, and S.S. Srinivasa. Teleoperation with intelligent and customizable interfaces. *Journal of Human-Robot Interaction*, 1(3), 2013
- [ 5 ] D. Berenson, S.S. Srinivasa, and J. Kuffner. Task Space Regions: A framework for pose-constrained manipulation planning. *The International Journal of Robotics Research*, 30(12):1435–1460, 2011

## (d) Synergistic Activities

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- **Curricula:** Developed two new graduate level courses, in robotic manipulation and robot autonomy:  
**16-843 Manipulation Algorithms** Graduate-level course on the theory and algorithms that enable robots to physically manipulate their world including the geometry of manipulation configuration spaces, motion planning, synthesizing robust grasps for dexterous hands, reconfiguring clutter, and physics-based actions.  
**16-662 Robot Autonomy** Graduate-level course on manipulation, motion planning, perception, navigation, and machine learning algorithms for mobile manipulators with strong hands-on component where students implement their assignments and class projects on a real mobile manipulation platform.
- **Open-source Software, Hardware and Benchmarks:** Barrett Technology “puck” motor controller; OWD, the Open WAM driver; COMPS, a constrained planning framework; MOPED, for object recognition and pose estimation; CHOMP, a gradient algorithm for trajectory optimization; GATMO, for navigation among movable objects; the YCB Object and Model Benchmark Dataset. The software is used by over 20 research groups around the world.
- **Service. Chairs and Editorships:** Editor, International Journal of Robotics Research 2013-; Editor, IEEE/RSJ IROS 2014-16; Program Chair RSS 2017, Founding Chair, IEEE Robotics and Automation Soc. Technical Committee on Mobile Manipulation 2010-12; Founding Program Chair, Robotics Track AAAI 2012-13; Area Chair, RSS 2012-13; Associate Editor, IEEE ICRA 2010-13; Associate Editor, IEEE/RSJ IROS 2011-12. **Workshops Organized:** IEEE ICRA 2015: Optimal Robot Motion Planning IEEE ICRA 2015: Benchmarking in Manipulation Research: The YCB Object and Model Set, IEEE IROS 2014: Rehabilitation and Assistive Robotics: Bridging the Gap Between Clinicians and Roboticians, IEEE IROS 2014: Robot Manipulation: What has been achieved and what remains to be done?, HRI 2013: Collaborative Manipulation: New Challenges for Robotics and HRI, RSS 2012: Robots in Clutter: Manipulation, Perception and Navigation in Human Environments, IEEE ICRA 2011: Mobile Manipulation: Integrating Perception and Manipulation, RSS 2010: Strategies and Evaluation for Mobile Manipulation in Household Environments, ICCV 2009: Computer Vision for Humanoid Robots in Real Environments and several others. **Selected Program Committees:** Human Robot Interaction 2012, 13, 14, 15; International Joint Conference on Artificial Intelligence (IJCAI) 2012; International Conference on Automated Planning and Scheduling (ICAPS) 2010; Robotics: Science and Systems (RSS) 2009, 10; AAAI Physically Grounded AI Track 2009, 11.
- **Undergraduate Education:** The Personal Robotics Lab has engaged over 50 undergraduates at CMU, including students from underrepresented groups, through class projects, independent projects, work studies during the school year, and REU summer research. The lab developed a self-sustaining culture of attracting top undergraduate students in CS, ME, EECS and BME, and many of these students continue on to graduate school, some with NSF fellowships. **Participation of underrepresented groups:** Srinivasa is a mentor for the Robotics Summer Scholars Program for underrepresented students, and has mentored 10 students since 2012 (4 female).
- **Public and K-12 outreach. Press:** The Personal Robotics Lab generates significant interest from the general public, with features in National Geographic, Scientific American, Popular Science, Wired Magazine, PBS, and the BBC. HERB was named one of the “World’s most advanced robots” in Businessweek. Srinivasa’s work was featured on the nsf.gov website and on NSF Science Nation. **Lab tours and talks:** HERB is a magnet for lab tours, with almost one tour a week. Srinivasa has hosted kindergarten, elementary, and high school groups, and given talks at local schools. The lab also demos at the annual National Robotics Week event for area high schools, which brings over 300 students for a day of lab tours and talks.

## References

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- [1] D. Berenson, S.S. Srinivasa, and J. Kuffner. Task Space Regions: A framework for pose-constrained manipulation planning. *The International Journal of Robotics Research*, 30(12):1435–1460, 2011.
- [2] A. Collet, B. Xiong, C. Gurau, M. Hebert, and S.S. Srinivasa. HerbDisc: Towards lifelong robotic object discovery. *The International Journal of Robotics Research*, 34(1):3—25, 2015.
- [3] A.D. Dragan, K.T. Lee, and S.S. Srinivasa. Teleoperation with intelligent and customizable interfaces. *Journal of Human-Robot Interaction*, 1(3), 2013.
- [4] A.D. Dragan and S.S. Srinivasa. A policy-blending formalism for shared control. *The International Journal of Robotics Research*, 32(7):790–805, 2013. (Conference version was **Best Conference Paper Award Finalist, RSS 2012**).
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- [6] M.C. Koval, N.S. Pollard, and S.S. Srinivasa. Pre- and post-contact policy decomposition for planar contact manipulation under uncertainty. *The International Journal of Robotics Research*, 35(1–3):244–264, 2016.
- [7] S. Nikolaidis, D. Hsu, and S.S. Srinivasa. Human-robot mutual adaptation in collaborative tasks: Models and experiments. *The International Journal of Robotics Research*, 36(5-7):618–634, 2017.
- [8] R. Paolini, A. Rodriguez, S.S. Srinivasa, and M.T. Mason. A data-driven statistical framework for post-grasp manipulation. *The International Journal of Robotics Research*, 33(4):600—615, 2014.
- [9] K. Strabala, M.K. Lee, A.D. Dragan, J. Forlizzi, S.S. Srinivasa, M. Cakmak, and V. Micelli. Towards seamless human-robot handovers. *Journal of Human-Robot Interaction*, 2(1), 2013.
- [10] M. Zucker, R. Ratliff, A.D. Dragan, M. Pivtoraiko, M. Klingensmith, C. Dellin, J.A. Bagnell, and S.S. Srinivasa. CHOMP: Covariant Hamiltonian Optimization for Motion Planning. *The International Journal of Robotics Research*, 32(9–10):1164–1193, 2013.