

Prof. Siddhartha Srinivasa

The Personal Robotics Lab
School of Computer Science & Engineering
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Employment

Boeing Endowed Professor in Computer Science & Engineering Computer Science & Engineering Department, The University of Washington at Seattle	2017-
Director of Robotics, Amazon Inc.	2018-
First Wave Founder, Berkshire Grey Inc.	2014-18
Finmeccanica Associate Professor in Computer Science Associate Professor, The Robotics Institute, Carnegie Mellon University	2013-17 2011-13
Senior Research Scientist, Intel Labs Pittsburgh	2005-11

Education

Ph.D., Carnegie Mellon University (CMU) Advisors: Michael Erdmann & Matthew Mason	August 2005 Thesis: <i>Control Synthesis for Dynamic Contact Manipulation</i>
B. Tech., Indian Institute of Technology Madras (IITM) Advisor: A. Radhakrishnan	August 1999 Thesis: <i>Reverse Engineering using the Structured Lighting Technique</i>

Honors and Awards

- IEEE Fellow, 2018
- ICAPS Best Paper Award Winner [37], 2018
- ACM/IEEE HRI Best Paper Award Finalist [35], 2018
- Boeing Endowed Professorship in Computer Science, 2017-∞
- CMU Womens Association outstanding graduating senior advisor (Rachel Holladay), 2017
- IEEE ICRA Best Vision Paper Award Finalist [61], 2016
- RSS Best Systems Paper Award Finalist [81], 2015
- IEEE ICRA Best Conference Paper Award Finalist [75], 2015
- IEEE ICRA Best Video Award Finalist [85], 2014
- Finmeccanica Chair in Computer Science, 2013-16
- RSS Early Career Spotlight Award, 2013
- RSS Best Paper Award Finalist [99], 2013
- IEEE ICRA Best Manipulation Paper Award Finalist [100], 2013
- Robotics Institute Cool Person of the Year Award, 2012
- Okawa Foundation Research Grant, 2012
- Office of Naval Research Young Investigator Award, 2012
- IEEE RO-MAN Best Paper Award Finalist [107], 2012
- RSS Best Paper Award Finalist [106], 2012
- RAS Most Active Technical Committee Award: Mobile Manipulation, 2011
- ACM/IEEE HRI Best Paper Award Winner [127], 2010
- IEEE IROS Best Paper Award Finalist [125], 2010
- IEEE ICRA Best Manipulation Paper Award Finalist [123], 2010
- IEEE ICRA Best Vision Paper Award Finalist [135], 2009
- Intel Corporate Technology Group Divisional Recognition Awards, May, July, Oct 2008
- Intel Research Pittsburgh Lab Research Awards, January, July 2006, January 2007
- Indian National Mathematics Olympiad, 1994

Mentoring

Current Students

Gilwoo Lee	Ph.D.	2015-
Brian Hou	Ph.D.	2016-
Aditya Vamsikrishna	Ph.D.	2016-
Jeongseok Lee	Ph.D.	2017-
Sherdil Niyaz	Ph.D.	2017-
Liyiming Ke	Ph.D.	2017-

Current Postdoctoral Fellows

Oren Salzman	2016-
Tapomayukh Bhattacharjee	2017-
Sanjiban Choudhury	2018-

Current Staff

Hanjun Song	2016-
Youngsun Kim	2017-
Rosario Scalise	2017-

Alumni - Postdoc

Daqing Yi, Postdoc	2016-2018
Research: <i>MCMC for Asymptotically-optimal Kinodynamic Planning</i>	Now: Researcher, Google

Henny Admoni, Postdoc	2015-2017
Research: <i>Eye Tracking for Human-Robot Shared Manipulation</i>	Now: Assistant Professor, CMU

Aaron Johnson, Postdoc	2015-2016
Research: <i>Convergent Planning</i>	Now: Assistant Professor, CMU

Alumni - Ph.D.

Stefanos Nikolaidis, Ph.D.	2014-2018
Thesis: <i>Mathematical Models of Adaptation in Human-Robot Collaboration</i>	Now: Assistant Professor, USC

Zita Marinho, Ph.D. (+Geoff Gordon)	2012-2018
Thesis: <i>Moment-based Algorithms for Structured Prediction</i>	Now: Research Scientist, Sacoor Brothers

Laura Herlant, Ph.D.	2013-2018
Thesis: <i>Algorithms, Implementation, and Studies on Eating with a Shared Control Robot Arm</i>	Now: Senior Robotics Research Scientist, iRobot

Shervin Javdani, Ph.D. (+Drew Bagnell)	2011-2017
Thesis: <i>Acting under Uncertainty for Information Gathering and Shared Autonomy</i>	Now: Researcher, Stealth

Jennifer King, Ph.D.	2012-2016
Thesis: <i>Robust Rearrangement Planning using Nonprehensile Interaction</i>	Now: Researcher, Stealth

Michael Koval, Ph.D. (+Nancy Pollard)	2012-2016
Thesis: <i>Robust Manipulation via Contact Sensing</i>	Now: Researcher, Stealth

Christopher Dellin, Ph.D.	2009-2016
Thesis: <i>Completing Manipulation Tasks Efficiently in Complex Environments</i>	Now: Researcher, Stealth

Matt Klingensmith, Ph.D. (+Michael Kaess)	2013-2016
Thesis: <i>Tracking and Calibrating Robot Arms using SLAM Techniques</i>	Now: Engineer, Boston Dynamics

Anca Dragan, Ph.D. Thesis: <i>Legible Robot Motion Planning</i>	2009-2015 Now: Assistant Professor, Berkeley
Mehmet Dogar, Ph.D. Thesis: <i>A Framework for Manipulation in Cluttered Environments</i>	2008-2013 Now: Assistant Professor, Leeds
Alvaro Collet, Ph.D. (+Martial Hebert) Thesis: <i>Lifelong Robotic Object Perception</i>	2009-2012 Now: Research Scientist, Facebook
Dmitry Berenson, Ph.D. (+James Kuffner) Thesis: <i>Constrained Manipulation Planning</i>	2006-2011 Now: Assistant Professor, Michigan
Alumni - M.S.	
Pengju Jin, M.S. Thesis: <i>Highly Robust Pose Estimation from Single Frame RGBD</i>	2017 Now: Researcher, Aurora
Shushman Choudhury, M.S. Thesis: <i>Anytime Geometric Motion Planning on Large Dense Roadmaps</i>	2015-2017 Now: Ph.D. Stanford
Rosario Scalise, M.S. (+Stephanie Rosenthal) Thesis: <i>Human-Centered Design of Robot Explanations</i>	2015-2017 Now: Research Staff, UW
Shen Li, M.S. (+Stephanie Rosenthal) Thesis: <i>Automatically Evaluating and Generating Clear Robot Explanations</i>	2015-2017 Now: Research Staff, MIT
Evan Shapiro, M.S. Thesis: <i>A Hierarchical Framework for Configuration Space Task Planning</i>	2013-15 Now: Ph.D. GTech
Aaron Walsman, M.S. Thesis: <i>ROCK: Robust Object Constellation for Kinematic Pose</i>	2013-15 Now: Ph.D. UW
Elizabeth Cha, M.S. (+Jodi Forlizzi) Thesis: <i>Robots in the Home: Qualitative and Quantitative Insights into Kitchen Organization</i>	2012-14 Now: Ph.D. USC
Kyle Strabala, M.S. Thesis: <i>Learning the Communication of Intent Prior to Physical Collaboration</i>	2010-2012 Now: Scientist, Near Earth Autonomy
Garratt Gallagher, M.S. (+Drew Bagnell) Thesis: <i>GATMO: A Generalized Approach to Tracking Movable Objects</i>	2007-2009 Now: Google Robotics
Martin Herrmann, M.S. (+Dr.-Inf. Uwe Hanebeck, Universität Karlsruhe) Thesis: <i>Active scene and object reconstruction for robotic manipulation from vision and laser</i>	2009 Now: TU Braunschweig
Alvaro Collet, M.S. (+Chris Atkeson) Thesis: <i>Object Recognition and Full Pose Registration from a Single Image for Robotic Manipulation</i>	2007-2009
Alumni - Other	
Rachel Holladay, B.S. Thesis: <i>Following Paths in Task Space: Distance Metrics and Planning Algorithms</i>	2013-2017 Now: Ph.D. MIT
Pry Matikainen, Teaching Fellow Research: <i>Visual Computing</i>	2015-2017 Now: Unknown
Prasanna Velagapudi, Research Scientist Research: <i>Multi-Step Mobile Manipulation</i>	2012-2014 Now: Researcher, Stealth

Student Fellowships

Dmitry Berenson	Intel
Alvaro Collet	Caja Madrid
Mehmet Dogar	Fulbright
Elizabeth Cha	NSF
Anca Dragan	Gordon Bell, Siebel, Dan David, Intel, Google Anita Borg, HRI Pioneer
Garratt Gallagher	NSF
Laura Herlant	Hertz, NSF, HRI Pioneer
Rachel Holladay	NCWIT, CMWA, SRC-URO, CRA Finalist, Hertz Finalist, HRI Pioneer
Brian Hou	NASA
Shervin Javdani	NSF, HRI Pioneer
Jennifer King	NASA
Michael Koval	NASA, NSF
Gilwoo Lee	Kwanjeong, CMU Presidential Fellowship
Zita Marinho	CMU-Portugal
Stefanos Nikolaidis	Gordon Bell, HRI Pioneer

Graduate Interns

Daniel Gallenberger (TU Munich)	Spring 2018
Stefania Pellegrinelli (ITIA-CNR)	Fall 2015
Marco Cagnetti (University of Rome)	Spring 2015
Joshua Haustein (Universität Karlsruhe)	2014
Henny Admoni (Yale)	Summer 2013
Georg Bartels (TU Bremen)	Summer 2013
Katie Correll	Spring 2013
Michael Koval	Summer 2012
Steven Gray (Penn)	Summer 2011
Vincenzo Micelli (University of Parma)	January 2011 - August 2011
Tim Niemueller (RWTH Aachen)	July 2010 - December 2010
Peter Kaiser (Universität Karlsruhe)	September 2010 - December 2010
Maya Cakmak (Georgia Tech)	Summer 2010
Alex Sorokin (UIUC)	September 2009 - April 2010
Lillian Chang	Summer 2009
Ross Knepper	Summer 2009
Laura Lindzey	Summer 2009
Manel Martinez	June-November 2009
Julius Ziegler (Universität Karlsruhe)	August-November 2009
Nico Blodow (TU Munich)	February-April 2009
Geoffrey Hollinger	Summer 2008
Kevin Peterson	Summer 2008
Nathan Ratliff	Summer 2007, 2008
Martin Rufli (ETH, Zürich)	Summer 2008
Rosen Diankov	September 2008 - January 2009
Michael Ashley-Rollman	Summer 2006
Stuart Anderson	Summer 2006
Michael DeRosa	Summer 2006
Ashish Deshpande (U.Mich)	Summer 2006
Jiaxin Fu	Summer 2006
Preethi Bhatt	Summer 2006

Undergraduate Interns

Kaiden James Field	2018-
Connor Geiman	2018-
Tao Jin	2018-
Maha Alrashed (BU)	Summer 2018
Abdullah Albakry (NC State)	Summer 2018
Ramon (Yiren) Qu	2017-
Nanda Sundaresan	2017-
Jeffrey Maxwell	2017-
Vinitha Ranganeni	Spring 2015-2017
Kevin Zhang	Spring 2015-2017
Pengju Jin	Fall 2014-2017
Joey Fernau	Spring 2015
Angela Wang	Fall 2014
Peter McHale	Fall 2014
Vikram Sunder	Spring 2014
Don Zheng	Spring 2014
Neil Jassal	Spring 2014
Myles Blodnick	Spring 2014
Scott Martin	Spring 2014
Yuyang Guo	Fall 2013 - Fall 2014
Rachel Holladay	Fall 2013-2017
Andrey Kurenkov (Georgia Tech)	Summer 2013
Abhijeet Tallavajhula (IIT)	Summer 2012
Bo Xiong (Connecticut)	Summer 2012
Corina Guaru (Jacobs)	Summer 2012
Debidatta Dwebi (IIT)	Summer 2012
Kenton Lee (Penn)	Summer 2012
Dominic Zirbel	Summer 2012
Tom Mullins	Fall 2011
Nick Stanley	Fall 2011
Alex Zirbel	Fall 2011 - Fall 2012
Tudor Achim	Summer 2009-Fall 2010
Andrew Yeager	Fall 2009
Ian-Clanton Thuon	Fall 2008 - Spring 2009
Daniel Dewey	Summer 2007 - Spring 2008

Ph.D Thesis Committees

Justin Huang (UW)	2018
Connor Schenk (UW)	2017-18
Kiril Solovey (Technion)	2018
Sanjiban Choudhury	2013-17
Venkatraman Narayanan	2013-17
Breelyn Kane Styler	2011-18
Mike Phillips	2011-15
Alberto Rodriguez	2007-13
Ross Knepper	2006-11
Nathan Ratliff	2004-09

Refereed Journals

- [1] Jeongseok Lee, Michael X. Grey, Sehoon Ha, Tobias Kunz, Sumit Jain, Yuting Ye, Siddhartha S. Srinivasa, Mike Stilman, and C. Karen Liu. DART: Dynamic animation and robotics toolkit. *The Journal of Open Source Software*, 3(22):500, feb 2018.
- [2] J.G. Gammell, T. Barfoot, and S.S. Srinivasa. Informed sampling for asymptotically optimal path planning. *IEEE Transactions on Robotics*, 2018. (To appear).
- [3] S. Javdani, H. Admoni, S. Pellegrinelli, S.S. Srinivasa, and J.A. Bagnell. Shared autonomy via hindsight optimization for teleoperation and teaming. *The International Journal of Robotics Research*, 2018. (To appear).
- [4] S. Nikolaidis, M. Kwon, J. Forlizzi, and S.S. Srinivasa. Planning with verbal communication for human-robot collaboration. *ACM Transactions on Human-Robot Interaction*, 2018. (To appear).
- [5] B. Calli, A. Singh, J. Bruce, W. W. Aaron, K. Konolige, S.S. Srinivasa, P. Abbeel, and A.M. Dollar. YCB benchmarking project: Object set, data set and their applications. *Journal of The Society of Instrument and Control Engineers*, 56(10):792–797, 2017.
- [6] I. Dryanovski, M.K. Klingensmith, S.S. Srinivasa, and J. Xiao. Large-scale, real-time 3D scene reconstruction on a mobile device. *Autonomous Robots*, 41(6):14231445, 2017.
- [7] M. Ghorbel, J. Pineau, R. Gourdeau, S. Javdani, and S.S. Srinivasa. A decision-theoretic approach for the collaborative control of a smart wheelchair. *International Journal of Social Robotics*, pages 1–15, 2017.
- [8] 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.
- [9] A. Johnson, J. King, and S.S. Srinivasa. Convergent planning. *IEEE Robotics and Automation Letters*, 2016.
- [10] M. Klingensmith, S.S. Srinivasa, and M. Kaess. Articulated robot manipulator simultaneous localization and mapping (ARM-SLAM). *IEEE Robotics and Automation Letters*, 2016.
- [11] 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.
- [12] B. Calli, A. Walsman, A. Singh, S.S. Srinivasa, P. Abbeel, and A.M. Dollar. Benchmarking in manipulation research: Using the Yale-CMU-Berkeley object and model set. *IEEE Robotics and Automation Magazine*, 22(3):36–52, 2015.
- [13] 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.
- [14] A.D. Dragan, R. Holladay, and S.S. Srinivasa. Deceptive robot motion: synthesis, analysis and experiments. *Autonomous Robots*, 39(3):331–345, 2015.
- [15] M.C. Koval, N.S. Pollard, and S.S. Srinivasa. Pose estimation for planar contact manipulation with manifold particle filters. *The International Journal of Robotics Research*, 34(7):922–945, 2015.
- [16] A. Stentz, H. Herman, A. Kelly, E. Meyhofer, G.C. Haynes, D. Stager, B. Zajac, J.A. Bagnell, J. Brindza, C. Dellin, M. George, J. Gonzalez-Mora, S. Hyde, M. Jones, M. Laverne, M. Likhachev, L. Lister, M.D. Powers, O. Ramos, J. Ray, D.P. Rice, J. Scheifflee, R. Sidki, S.S. Srinivasa, K. Strabala, J.P. Tardif, J. Valois, J.M. Vandeweghe, M.D. Wagner, and C. Wellington. CHIMP, the CMU highly intelligent mobile platform. *Journal of Field Robotics*, 32(2):209–228, 2015.
- [17] A.D. Dragan and S.S. Srinivasa. Integrating human observer inferences into robot motion planning. *Autonomous Robots*, 37(4):351–368, 2014.
- [18] 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.

- [19] M.R. Dogar, M.C. Koval, A. Tallavajhula, and S.S. Srinivasa. Object search by manipulation. *Autonomous Robots*, 36(1–2):153–167, 2013.
- [20] M.R. Dogar and S.S. Srinivasa. Physics-based manipulation in human environments. *Journal of the Robotics Society of Japan*, 31(4):353–357, 2013.
- [21] A.D. Dragan, K.T. Lee, and S.S. Srinivasa. Teleoperation with intelligent and customizable interfaces. *Journal of Human-Robot Interaction*, 1(3), 2013.
- [22] 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**).
- [23] 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.
- [24] 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.
- [25] M.R. Dogar and S.S. Srinivasa. A planning framework for non-prehensile manipulation under clutter and uncertainty. *Autonomous Robots*, 33(3):217–236, 2012. (Conference version was **Best Conference Paper Award Finalist, IEEE IROS 2010**).
- [26] R.A. Knepper, S.S. Srinivasa, and M.T. Mason. Toward a deeper understanding of motion alternatives via an equivalence relation on local paths. *The International Journal of Robotics Research*, 31(2):168–187, 2012.
- [27] M.T. Mason, A. Rodriguez, S.S. Srinivasa, and A.S. Vazquez. Autonomous manipulation with a general-purpose simple hand. *The International Journal of Robotics Research*, 31(5):688–703, 2012.
- [28] S.S. Srinivasa, D. Berenson, M. Cakmak, A. Collet, M.R. Dogar, A.D. Dragan, R.A. Knepper, T. Niemueller, K. Strabala, M. Vandeweghe, and J. Ziegler. HERB 2.0: Lessons learned from developing a mobile manipulator for the home. *Proceedings of the IEEE*, 100(8):1–19, 2012.
- [29] 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.
- [30] A. Collet, M. Martinez, and S.S. Srinivasa. The MOPED framework: Object recognition and pose estimation for manipulation. *The International Journal of Robotics Research*, 30(10):1284–1306, 2011. (Conference version was **Best Vision Paper Award Finalist, IEEE ICRA 2009**).
- [31] S.S. Srinivasa, D. Ferguson, C.J. Helfrich, D. Berenson, A. Collet, R. Diankov, G. Gallagher, G. Hollinger, J. Kuffner, and M.V. Weghe. HERB: A Home Exploring Robotic Butler. *Autonomous Robots*, 28(1):5–20, 2010.
- [32] P. Yang, R.A. Freeman, G.J. Gordon, K.M. Lynch, S.S. Srinivasa, and R. Sukthankar. Decentralized estimation and control of graph connectivity for mobile sensor networks. *Automatica*, 46(2):390–396, 2010.
- [33] S.S. Siddhartha, R. Narasimha, A.J. Basu, and S.V. Kailas. Coherent structures in numerically simulated jets with and without off-source heating. *Fluid Dynamics Research*, 26(2):105–117, 2000.

Refereed Conferences

- [34] R. Aronson, T. Santini, T. Kübler, E. Kasneci, S.S. Srinivasa, and H. Admoni. Eye-hand behavior in human-robot shared manipulation. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2018.
- [35] M. Chen*, S. Nikolaidis*, H. Soh, D. Hsu, and S.S. Srinivasa. Planning with trust for human-robot collaboration. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2018. **Best Conference Paper Award Finalist**.
- [36] S. Choudhury, S.S. Srinivasa, and S. Scherer. Bayesian active edge evaluation on expensive graphs. In *International Joint Conference on Artificial Intelligence*, 2018.

- [37] N. Haghtalab, S. Mackenzie, A.D. Procaccia, O Salzman, and S.S. Srinivasa. The Provable Virtue of Laziness in Motion Planning. In *International Conference on Automated Planning and Scheduling*, 2018. **Best Conference Paper Award Winner**.
- [38] A. Hefny, Z. Marinho, W. Sun, S.S. Srinivasa, and G. Gordon. Recurrent predictive state policy networks. In *International Conference on Machine Learning*, 2018.
- [39] A. Mandalika, O. Salzman, and S.S. Srinivasa. Lazy Receding Horizon A* for Efficient Path Planning in Graphs with Expensive-to-Evaluate Edges. In *International Conference on Automated Planning and Scheduling*, 2018.
- [40] D. Yi, R. Thakker, C. Gulino, O. Salzman, and S.S. Srinivasa. Generalizing informed sampling for asymptotically-optimal sampling-based kinodynamic planning via markov chain monte carlo. In *IEEE International Conference on Robotics and Automation*, 2018.
- [41] S. Choudhury, S. Javdani, S.S. Srinivasa, and S. Scherer. Near-optimal edge evaluation in explicit generalized binomial graphs. In *Advances in Neural Information Processing Systems*, 2017.
- [42] S. Choudhury, O. Salzman, S. Choudhury, and S.S. Srinivasa. Densification strategies for anytime motion planning over large dense roadmaps. In *IEEE International Conference on Robotics and Automation*, 2017.
- [43] S. Choudhury and S.S. Srinivasa. A bayesian active learning approach to adaptive motion planning. In *International Symposium on Robotics Research*, 2017.
- [44] A. Hefny, Z. Marinho, C. Downey, W. Sun, S.S. Srinivasa, and G. Gordon. Predictive state models for prediction and control in partially observable environments. In *Conference on Robot Learning*, 2017.
- [45] P. Jin, P. Matikainen, and S.S. Srinivasa. Sensor fusion for fiducial tags: Highly robust pose estimation from single frame RGBD. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2017.
- [46] J. King, V. Ranganeni, and S.S. Srinivasa. Unobservable monte carlo planning for nonprehensile rearrangement tasks. In *IEEE International Conference on Robotics and Automation*, 2017.
- [47] M. Klingensmith, M. Koval, S.S. Srinivasa, N. Pollard, and M. Kaess. The manifold particle filter for state estimation on high-dimensional implicit manifolds. In *IEEE International Conference on Robotics and Automation*, 2017.
- [48] S. Nikolaidis, S. Nath, A. Procaccia, and S.S. Srinivasa. Game-theoretic modeling of human adaptation in human-robot collaboration. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2017.
- [49] S. Nikolaidis and S.S. Srinivasa. Modeling human adaptation in repeated collaborative tasks. In *International Conference on Pervasive Technologies Related to Assistive Environments*, 2017.
- [50] S. Nikolaidis, Zhu. Y., D. Hsu, and S.S. Srinivasa. Human-robot mutual adaptation in shared autonomy. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2017.
- [51] J. Pajarinen, V. Kyrki, M. Koval, S.S. Srinivasa, J. Peters, and G. Neumann. Hybrid control trajectory optimization under uncertainty. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2017.
- [52] O. Salzman, B. Hou, , and S.S. Srinivasa. Efficient motion planning for problems lacking optimal substructure. In *International Conference on Automated Planning and Scheduling*, 2017.
- [53] D. Yi, S. Choudhury, and S.S. Srinivasa. Incorporating qualitative information into quantitative estimation via sequentially constrained hamiltonian monte carlo sampling. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2017.
- [54] S. Choudhury, C. Dellin, and S.S. Srinivasa. Pareto-optimal search over configuration space beliefs for anytime motion planning. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2016.
- [55] S. Choudhury, J. Gammell, T. Barfoot, and S.S. Srinivasa. Regionally accelerated batch informed trees (RABIT*): A framework to integrate local information into optimal path planning. In *IEEE International Conference on Robotics and Automation*, 2016.

- [56] C. Dellin and S.S. Srinivasa. A unifying formalism for shortest path problems with expensive edge evaluations via lazy best-first search over paths with edge selectors. In *International Conference on Automated Planning and Scheduling*, 2016.
- [57] L. Herlant, R. Holladay, and S.S. Srinivasa. Assistive teleoperation of robot arms via automatic time-optimal mode switching. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2016.
- [58] R. Holladay and S.S. Srinivasa. Distance metrics and algorithms for task space path optimization. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2016.
- [59] A. Johnson, J. King, and S.S. Srinivasa. Convergent planning. In *IEEE International Conference on Robotics and Automation*, 2016.
- [60] J. King, M. Cagnetti, and S.S. Srinivasa. Rearrangement planning using object-centric and robot-centric action spaces. In *IEEE International Conference on Robotics and Automation*, 2016.
- [61] M. Klingensmith, S.S. Srinivasa, and M. Kaess. Articulated robot manipulator simultaneous localization and mapping (ARM-SLAM). In *IEEE International Conference on Robotics and Automation*, 2016. **Best Vision Paper Award Finalist.**
- [62] M. Koval, D. Hsu, N.S. Pollard, and S.S. Srinivasa. Configuration lattices for planar contact manipulation under uncertainty. In *Workshop on the Algorithmic Foundations of Robotics*, 2016.
- [63] J.S. Lee, K.C. Liu, F.C. Park, and S.S. Srinivasa. A linear-time variational integrator for multibody systems. In *Workshop on the Algorithmic Foundations of Robotics*, 2016.
- [64] S. Li, Scalise. R., H. Admoni, S.S. Srinivasa, and Rosenthal. S. Spatial references and perspective in natural language instructions for collaborative manipulation. In *IEEE International Symposium on Robot and Human Interactive Communication*, 2016.
- [65] Z. Marinho, B. Boots, A. Dragan, A. Byravan, G. Gordon, and S.S. Srinivasa. Functional gradient motion planning in reproducing kernel hilbert spaces. In *Robotics: Science and Systems*, 2016.
- [66] S. Nikolaidis, A.D. Dragan, and S.S. Srinivasa. Viewpoint-based legibility optimization. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2016.
- [67] S. Nikolaidis, D. Hsu, and S.S. Srinivasa. Formalizing human-robot mutual adaptation via a bounded memory based model. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2016.
- [68] S. Pellegrinelli, H. Admoni, S. Javdani, and S.S. Srinivasa. Human-robot shared workspace collaboration via hindsight optimization. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2016.
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- [70] E. Cha, A.D. Dragan, and S.S. Srinivasa. Perceived robot capability. In *IEEE International Symposium on Robot and Human Interactive Communication*, 2015.
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Reports and Theses

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Seminars

Northwestern	2018
Toyota Technological Institute at Chicago	2018
Georgia Tech	2018
Amazon	2018
Microsoft Research	2017
Carnegie Mellon	2017
Princeton	2017
University of Washington	2017
Harvard	2016
MIT	2016
National University of Singapore	2014
University of Pennsylvania	2011
National Taiwan University	2010
Indian Institute of Technology Madras	2010
West Penn Hospital	2007

Others: Too numerous to count.

Teaching

CSE 490R Robotics

Winter 2017-

Paul G. Allen School for Computer Science & Engineering

Brand new undergraduate-level robotics course on robotics in the real world. The course covers state estimation (particle filters, motion models, sensor models etc), planning/control (search based planners, lattice based planners, trajectory following techniques etc), and perception and learning (object detection, learning from demonstrations etc.). Student teams implement algorithms on the RACECAR platform developed by Prof. Srinivasa for the course.

CSE 599 Advanced Robotics

Fall 2017-

Paul G. Allen School for Computer Science & Engineering

Brand new graduate-level robotics course on motion planning algorithms. The course covers the Piano Movers Problem, sampling-based planning, minimum dispersion graphs, efficient search, lazy and anytime planning, planning under uncertainty with application to mobile manipulators and humanoid robots, with a focus on algorithmic foundations and theorem proving.

16-843 Manipulation Algorithms

Fall 2012-16

The Robotics Institute, Carnegie Mellon University

Brand new graduate-level robotics course on the theory and algorithms that enable robots to physically manipulate their world. The course covers the geometry of manipulation configuration spaces, motion planning in these spaces, synthesizing robust and stable grasps for dexterous hands, reconfiguring clutter, task-level planning of multi-stage manipulation, physics-based actions, and addressing perception and model uncertainty, with application to mobile manipulators and humanoid robots.

16-662 Robot Autonomy

Spring 2012-16

The Robotics Institute, Carnegie Mellon University

Brand new graduate-level robotics course on manipulation, motion planning, perception, navigation, and machine learning algorithms for mobile manipulators. The course covers theory and algorithms, and has a strong hands-on component where students implement their assignments and class projects on a real mobile manipulation platform.

16-741 Mechanics of Manipulation

Spring 2009

The Robotics Institute, Carnegie Mellon University

Co-taught with Matt Mason

Graduate-level robotics core course on model-based robotic manipulation. To develop techniques for rigid body mechanics, kinematic constraint, Coulomb friction, gravity, and impact, and apply these techniques to manipulation problems including picking and placing, parts orienting, assembly, and mobile manipulation.

Professional Activities

Board Member	RSS Foundation	2016-
Editor	International Journal of Robotics Research (IJRR)	2014-
Editor	IEEE/RSJ IROS	2014-2016
Editor	A Roadmap for U.S. Robotics: From Internet to Robotics	2013
Guest Editor	IJRR, RSS Special Issue	2013
Guest Editor	Autonomous Robots, RSS Special Issue	2013
Guest Editor	IEEE RAM, Special Issue on Mobile Manipulation	2012
Associate Editor	IEEE/RSJ IROS	2011-2012
Associate Editor	IEEE ICRA	2010-2013

Selected Organization

Organizer	UW CSE MSR Summer Institute on Social Robotics	2018
Program Chair	Robotics: Science and Systems (RSS)	2017
Organizer	Dagstuhl Seminar on Multimodal Manipulation Under Uncertainty	2015
Presentations Chair	IEEE IROS	2014
Chair	IEEE ICRA Best Manipulation Paper Award Committee	2013
Publications Chair	RSS	2013
Founding Program Chair	Robotics Track AAAI	2012-2013
Senior Program Committee	AAAI	2012-2013
Founding Chair	IEEE RAS Technical Committee on Mobile Manipulation	2010-2012
Short Presentations Chair	RSS	2012
Area Chair	RSS	2011-2012

Workshops Organized: Too numerous to count.

Long-term Program Committees: International Conference on Human-Robot Interaction (HRI) 2012-; International Conference on Automated Planning and Scheduling (ICAPS) 2010-; Robotics: Science and Systems (RSS) 2009-; Workshop on the Algorithmic Foundations of Robotics (WAFR) 2012-; AAAI Special Track on Physically Grounded AI 2009-2011.

University Service

Member	UW CSE Admissions Committee	2017-
Member	RI Curriculum Program Committee	2015-2017
Member	RI Faculty Hiring Committee	2015-2017
Chair	SCS ACM Doctoral Dissertation Award Committee	2014
Chair	RI Admissions Committee	2014
Member	RI Director Search Committee	2014
Member	SCS Student Teaching Award Committee	2014
Member	SCS Graduate Fellowship Committee	2012-2014
Member	RI Admissions Committee	2012-2015
Member	QoLT Director Search Committee	2012

Grants

Current

National Science Foundation (#1839371) Title: <i>Safe Imitation Learning for Robotics</i> Division of Mathematical Sciences, the Division of Computing and Communication Foundations, and the Division of Information and Intelligent Systems co-PI, PI: Zaid Harchaoui, UW	2018-21
HONDA HONDA Research Institute Title: <i>Formalizing Mathematical Models of Curiosity</i> PI	2018-21
Amazon Amazon Research Award Title: <i>Data Efficient Policy Search for Reinforcement Learning</i> PI	2017-18
Office of Naval Research (#ONR N00014-16-R-BA01) Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology Title: <i>Enabling dexterous physics-based manipulation via a learning framework for shared autonomy</i> PI	2017-20
National Science Foundation (#1748582, \$ 453,379) National Robotics Initiative (NRI) Title: <i>NRI: Collaborative Research: Learning Deep Sensorimotor Policies for Shared Autonomy</i> PI, co-PI: Sergey Levine, Berkeley	2017-19
National Science Foundation (#1544797, \$ 435,928) Cyber-Physical Systems (CPS) Title: <i>CPS: Synergy: Collaborative Research: Learning control sharing strategies for assistive cyber-physical systems</i> PI, co-PI: Brenna Argall, Northwestern	2015-18
National Science Foundation (#1409003, \$ 1,076,210) Robust Intelligence, Division of Information & Intelligent Systems (IIS) Title: <i>RI: Medium: The Foundations of a Manipulation Repertoire</i> Co-PI, PI: Matt Mason, Co-PI: Michael Erdmann, CMU	2014-18

Past

National Institute of Health R01 (#R01EB019335) Title: <i>A Formalism for Customizing and Training Intelligent Assistive Devices</i> PI, co-PI: Brenna Argall, Northwestern	2014-17
Office of Naval Research (#ONR BAA 13-0001) ONR Basic Research Challenges in the Science of Autonomy Title: <i>Mental Simulation of Intentions for Collaborative Human-Robot Learning and Planning</i> co-PI, PI: Andrea Thomaz, Georgia Tech.	2014-17
Toyota Toyota Motor Engineering & Manufacturing (TEMA) Title: <i>Physics-based Intelligent Manipulation in Clutter</i> PI	2013-2017
Defense Advanced Research Projects Agency Simplifying Complexity in Scientific Discovery (SIMPLEX) Title: <i>An Architecture for Shared Autonomy via Optimal Control</i> PI	2015-16
Richard King Mellon Foundation Title: <i>Intelligent asisstive technology for individuals with physical disabilities</i> PI	2016
Office of Naval Research Young Investigator Award (ONR-YIP) Title: <i>Enabling Advanced Autonomous Physical Manipulation Capabilities for Robots in Human-Robot Teams</i> PI	2012-15
Defense Advanced Research Projects Agency (#DARPA-BAA-12-39) Robotics Challenge Track A Co-PI, PI: Tony Stenz, CMU	2012-15
Intel Embedded Computing Science and Technology Center Title: <i>Lifelong Learning in the Real World</i> Joint PI with: Drew Bagnell, CMU	2012-14
ABB Research Grant Title: <i>In-hand manipulation with a simple gripper</i> co-PI, PI: Matt Mason, CMU	2013-14
Research for Advanced Manufacturing in Pennsylvania (RAMP) Title: <i>Robotics-enhanced, Cost-effective Motion Test Equipment for Inertial MEMS Devices</i> PI, co-PI: David Bourne, CMU. Industry Collaborator: Acutronic Inc.	2013
National Science Foundation (#1208388, \$ 150,456) National Robotics Initiative (NRI) Title: <i>Addressing Clutter and Uncertainty for Robotic Manipulation in Human Environments</i> PI, co-PI: Kevin Lynch, Northwestern	2012-13
National Science Foundation (#1228906, \$ 24,808) Robust Intelligence, Division of Information & Intelligent Systems (IIS) Title: <i>EAGER: Building Intelligent Mobile Manipulators for Assistive Care</i> Co-PI, PI: Matt Mason, CMU	2012-13

National Science Foundation (#0916557, \$ 515,079) Robust Intelligence, Division of Information & Intelligent Systems (IIS) Title: <i>A Simple but General Hand</i> Co-PI, PI: Matt Mason, CMU	2009-13
National Science Foundation (#0540865, \$ 16,105,954) Ret Supplements, Engineering Research Centers, Human Resources Development Title: <i>Quality of Life Technology Engineering Research Center</i> QoltBots Project Leader, PI: Takeo Kanade, CMU	2006-16
Defense Advanced Research Projects Agency (#DARPA-BAA-10-28) Autonomous Robotic Manipulation Software Track (ARM-S) Title: <i>REARM: Robust Extensible Autonomous Robotic Manipulation</i> Co-PI, PI: SRI	2010-11
National Science Foundation (#0646448, \$ 99,785) Small Business Phase II , Division of Industrial Innovation & Partnerships (IIP) Title: <i>Methodology for Applying Haptic Robotics to Agile Manufacturing</i> Subcontractor, PI: William Townsend, Barrett Technologies	2009-12

Selected Press Coverage ([Longer list](#))

2018	
MIT Tech Review	Research robots sometimes left unsecured on the internet, study finds
KUOW Public Radio	The Record: Robotics
Washington Post	An expert explains how close we are to 'The Jetsons.'
GeekWire	UWs HERB robot makes cameo on X-Files as automated sushi waiter
2017 (moved to UW)	
BBC World Live	Autonomous Weapons that use AI
IEEE The Institute	IEEE Members Build Robots to Help People with Disabilities Live Independently
New York Times	Learning to love our robot co-workers
GeekWire	Robotics expert moves entire team to UW, including famous Oreo-cracking robot
2016	
Wired	Come on, Lets Give the Robots Hands Already
Discovery Channel	Robot Vision
Yahoo Tech	Meet the man building HERB – the closest thing we have to Rosie the Robot
Huffpost Tech	Robot Butler's Creativity Surprises Its Own Makers
Tech Republic	What Zuckerberg can learn from CMU's HERB
2015	
USA Today	Where the Jobs Are: Workers vs Automation
The Guardian	Robots are leaving the factory floor and heading for your desk - and your job
New York Times Magazine	Uber Would Like to Buy Your Robotics Department
Pittsburgh Post-Gazette	'Robots' like you have never seen them before
2014	
National Geographic	Robots 3D IMAX Movie
Washington Post	HERB: A robot that can unload a dishwasher and (sometimes) take apart an Oreo
National Geographic	Going Deep with David Rees: How to open a door
The Verge	Robot city: how the machines are driving Pittsburgh's future
Pittsburgh Post Gazette	CMU play pairs HERB the robot with human actor
Politico	Robots at Work
Discovery Channel	When Will My Robotic Housekeeper Be Ready?
NPR	Robots that Care: The Quality of Life Technology Center Changing the World of Care-giving

2013

CNN	When it's too hard to separate Oreos...
Discovery Channel	Autonomous Robot Comprehends Objects On Its Own
New York Times	Disruptions: Helper Robots Are Steered, Tentatively, to Care for the Aging
Wall Street Journal	Not the Jetsons, but Rosie could be your nurse
Time Magazine	Welcome to Roboburgh
CBS	Robotic Servants are here to help

2012

Engadget	Robotic butlers, bartenders and receptionists at Carnegie Mellon
Popular Science	HERB the Robot Butler Microwaves Your Dinner For You
Time Magazine	Meet HERB, the Robot Butler That Knows How to Use a Microwave
Fast Company	This Week In Bots: Will Your Kids Give Robots Civil Liberties?
NPR	Marketplace: Good Robots Make Jobs
National Geographic	Us. And them. Robots are being created that can think, act, and relate to humans. Are we ready?

2007-2011 (At Intel)

NSF Science Nation	HERB: A robot to help around the house
Scientific American	Can Robots Be Programmed to Learn from Their Own Experiences?
BBC	The dawn of intelligent machines
Businessweek	World's most advanced robots
Fast Company	Intel's Robot Butler Serves, Clears, and Does Dishes
Wired Magazine	Butler Robot Can Fetch Drinks, Snacks
Granta	What I think about when I think about robots
Discovery Channel	The robot butler
Popular Science	Rise of the Helpful Machines: Meet 10 of the most advanced human-assist 'bots from around the world

Extracurricular

- 140/13,072=0.01-th Place overall and 12/790=0.01-th Place in age group, Pittsburgh Half Marathon, 2017
- 6th Place overall and 1st Place in age group, Montour Trail Half Marathon, 2016
- 3rd Place, Finish MS 5M Run, 2015
- Fastest advisor-student time, Random Distance Run, 2013
- LaSalle Bank Chicago Marathon 2007, 2008
- Pittsburgh AB Squash League champion 2005
- Pittsburgh C Squash League champion 2002
- Institute silver medalist in Badminton, Indian Institute of Technology Madras 1998
- Institute bronze medalist in Tennis, Indian Institute of Technology Madras 1997, 1998