

# Prof. Siddhartha Srinivasa

The Personal Robotics Lab  
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## Employment

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Boeing Endowed Professor in Computer Science & Engineering Computer Science & Engineering Department, The University of Washington at Seattle	2017-
Director, Robotics AI, 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

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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

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- ACM/HRI Best Paper Award Winner for Technical Advances in HRI [42], 2019
- ICAPS Best Paper Award Winner [48], 2019
- IEEE Fellow, 2018
- ICAPS Best Paper Award Winner [58], 2018
- ACM/IEEE HRI Best Paper Award Finalist [56], 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 [85], 2016
- RSS Best Systems Paper Award Finalist [105], 2015
- IEEE ICRA Best Conference Paper Award Finalist [99], 2015
- IEEE ICRA Best Video Award Finalist [109], 2014
- Finmeccanica Chair in Computer Science, 2013-16
- RSS Early Career Spotlight Award, 2013
- RSS Best Paper Award Finalist [123], 2013
- IEEE ICRA Best Manipulation Paper Award Finalist [124], 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 [131], 2012
- RSS Best Paper Award Finalist [130], 2012
- RAS Most Active Technical Committee Award: Mobile Manipulation, 2011

- ACM/IEEE HRI Best Paper Award Winner [151], 2010
- IEEE IROS Best Paper Award Finalist [149], 2010
- IEEE ICRA Best Manipulation Paper Award Finalist [147], 2010
- IEEE ICRA Best Vision Paper Award Finalist [159], 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

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### Current Students

Gilwoo Lee	Ph.D.		2015-
Brian Hou	Ph.D.		2016-
Aditya Vamsikrishna	Ph.D.		2016-
Sherdil Niyaz	Ph.D.		2017-
Liyiming Ke	Ph.D.		2017-
William Agnew	Ph.D.	+Pedro Domingos	2017-
Ethan Gordon	Ph.D.		2018-
Matthew Schmittle	Ph.D.	+Dieter Fox	2018-
Amal Nanvati	Ph.D.	+Maya Cakmak	2019-
Motoya Ohnishi	Ph.D.	+Sham Kakade	2019-

### Current Postdoctoral Fellows

Tapomayukh Bhattacharjee	2017-
Sanjiban Choudhury	2018-
Matthew Barnes	2019-
Fereshteh Sadeghi	2019-
Christoforos Mavrogiannis	2019-

### Current Staff

Rosario Scalise	2017-
Ajinkya Kamat	2018-

### Alumni - Postdoc

Oren Salzman	2016-2019
Research: <i>The Provable Virtue of Laziness in Motion Planning</i>	Now: Assistant Professor, Technion
Daqing Yi	2016-2018
Research: <i>MCMC for Asymptotically-optimal Kinodynamic Planning</i>	Now: Software Engineer, Google
Henny Admoni	2015-2017
Research: <i>Eye Tracking for Human-Robot Shared Manipulation</i>	Now: Assistant Professor, CMU
Aaron Johnson	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, Saco 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: *Acting under Uncertainty for Information Gathering and Shared Autonomy* Now: Robotics Engineer, Aurora

Jennifer King, Ph.D. 2012-2016  
Thesis: *Robust Rearrangement Planning using Nonprehensile Interaction* Now: Robotics Engineer, Berkshire Grey

Michael Koval, Ph.D. (+Nancy Pollard) 2012-2016  
Thesis: *Robust Manipulation via Contact Sensing* Now: Software Engineer, Waymo

Christopher Dellin, Ph.D. 2009-2016  
Thesis: *Completing Manipulation Tasks Efficiently in Complex Environments* Now: Roboticist, Nuro

Matt Klingensmith, Ph.D. (+Michael Kaess) 2013-2016  
Thesis: *Tracking and Calibrating Robot Arms using SLAM Techniques* Now: Roboticist, Boston Dynamics

Anca Dragan, Ph.D. 2009-2015  
Thesis: *Legible Robot Motion Planning* Now: Assistant Professor, Berkeley

Mehmet Dogar, Ph.D. 2008-2013  
Thesis: *A Framework for Manipulation in Cluttered Environments* Now: Assistant Professor, Leeds

Alvaro Collet, Ph.D. (+Martial Hebert) 2009-2012  
Thesis: *Lifelong Robotic Object Perception* Now: Engineering Lead, Facebook

Dmitry Berenson, Ph.D. (+James Kuffner) 2006-2011  
Thesis: *Constrained Manipulation Planning* Now: Associate Professor, Michigan

#### Alumni - M.S.

Jeongseok Lee, M.S. 2016-18  
Thesis: *A Linear-Time Variational Integrator for Multibody Systems* Now: Engineer, Amazon

Pengju Jin, M.S. 2017  
Thesis: *Highly Robust Pose Estimation from Single Frame RGBD* Now: Researcher, Aurora

Shushman Choudhury, M.S. 2015-2017  
Thesis: *Anytime Geometric Motion Planning on Large Dense Roadmaps* Now: Ph.D. Stanford

Rosario Scalise, M.S. (+Stephanie Rosenthal) 2015-2017  
Thesis: *Human-Centered Design of Robot Explanations* Now: Research Staff, UW

Shen Li, M.S. (+Stephanie Rosenthal) 2015-2017  
Thesis: *Automatically Evaluating and Generating Clear Robot Explanations* Now: Ph.D., MIT

Evan Shapiro, M.S. 2013-15  
Thesis: *A Hierarchical Framework for Configuration Space Task Planning* Now: CEO, Coda Protocol

Aaron Walsman, M.S. 2013-15  
Thesis: *ROCK: Robust Object Constellation for Kinematic Pose* Now: Ph.D. UW

Elizabeth Cha, M.S. (+Jodi Forlizzi) 2012-14  
Thesis: *Robots in the Home: Qualitative and Quantitative Insights into Kitchen Organization* Now: Engineer, Waymo

Kyle Strabala, M.S. 2010-2012  
Thesis: *Learning the Communication of Intent Prior to Physical Collaboration* Now: Scientist, Near Earth Autonomy

Garratt Gallagher, M.S. (+Drew Bagnell)	2007-2009
Thesis: <i>GATMO: A Generalized Approach to Tracking Movable Objects</i>	Now: Google Robotics

Martin Herrmann, M.S. (+Dr.-Inf. Uwe Hanebeck, Universität Karlsruhe)	2009
Thesis: <i>Active scene and object reconstruction for robotic manipulation from vision and laser</i>	Now: TU Braunschweig

Alvaro Collet, M.S. (+Chris Atkeson)	2007-2009
Thesis: <i>Object Recognition and Full Pose Registration from a Single Image for Robotic Manipulation</i>	

### Alumni - Other

Youngsun Kim, Staff	2017-19
Research: <i>Robot-Assisted Feeding</i>	Now: Engineer, Amazon

Hanjun Song, Staff	2016-19
Research: <i>Sensing Shear Forces During Food Manipulation</i>	Now: Ph.D. MIT

Rachel Holladay, B.S.	2013-2017
Thesis: <i>Following Paths in Task Space: Distance Metrics and Planning Algorithms</i>	Now: Ph.D. MIT

Pyry Matikainen, Teaching Fellow	2015-2017
Research: <i>Visual Computing</i>	Now: Unknown

Prasanna Velagapudi, Research Scientist	2012-2014
Research: <i>Multi-Step Mobile Manipulation</i>	Now: Director of Engineering, Berkshire Grey

### 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 Guarú (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  
Ian-Clanton Thuon  
Daniel Dewey

Fall 2009  
Fall 2008 - Spring 2009  
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

### Publications ([Google Scholar](#))

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#### Refereed Journals

- [1] T. Bhattacharjee, G. Lee, H. Song, and S.S. Srinivasa. Towards robotic feeding: Role of haptics in fork-based food manipulation. *IEEE Robotics and Automation Letters*, 2019.
- [2] M. Chen, S. Nikolaidis, H. Soh, D. Hsu, and S.S. Srinivasa. Trust-aware decision making for human-robot collaboration: Model learning and planning. *ACM Transactions on Human-Robot Interaction*, 2019. (To appear).
- [3] J.G. Gammell, T. Barfoot, and S.S. Srinivasa. Informed asymptotically optimal anytime search. *The International Journal of Robotics Research*, 2019. (To appear).
- [4] R. Holladay, O. Salzman, and S.S. Srinivasa. Minimizing task-space fréchet error via efficient incremental graph search. *IEEE Robotics and Automation Letters*, 2019.
- [5] 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.
- [6] J.G. Gammell, T. Barfoot, and S.S. Srinivasa. Informed sampling for asymptotically optimal path planning. *IEEE Transactions on Robotics*, 34(4):966–984, 2018.
- [7] 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*, 37(7):717–742, 2018.
- [8] S. Nikolaidis, M. Kwon, J. Forlizzi, and S.S. Srinivasa. Planning with verbal communication for human-robot collaboration. *ACM Transactions on Human-Robot Interaction*, 7(3), 2018.
- [9] 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.
- [10] 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):1423–1445, 2017.
- [11] 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.
- [12] 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.
- [13] A. Johnson, J. King, and S.S. Srinivasa. Convergent planning. *IEEE Robotics and Automation Letters*, 2016.

- [14] M. Klingensmith, S.S. Srinivasa, and M. Kaess. Articulated robot manipulator simultaneous localization and mapping (ARM-SLAM). *IEEE Robotics and Automation Letters*, 2016.
- [15] 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.
- [16] 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.
- [17] 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.
- [18] A.D. Dragan, R. Holladay, and S.S. Srinivasa. Deceptive robot motion: synthesis, analysis and experiments. *Autonomous Robots*, 39(3):331–345, 2015.
- [19] 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.
- [20] 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.
- [21] A.D. Dragan and S.S. Srinivasa. Integrating human observer inferences into robot motion planning. *Autonomous Robots*, 37(4):351–368, 2014.
- [22] 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.
- [23] M.R. Dogar, M.C. Koval, A. Tallavajhula, and S.S. Srinivasa. Object search by manipulation. *Autonomous Robots*, 36(1–2):153–167, 2013.
- [24] 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.
- [25] A.D. Dragan, K.T. Lee, and S.S. Srinivasa. Teleoperation with intelligent and customizable interfaces. *Journal of Human-Robot Interaction*, 1(3), 2013.
- [26] 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**).
- [27] 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.
- [28] 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.
- [29] 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**).
- [30] 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.
- [31] 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.
- [32] 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.

- [33] 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.
- [34] 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**).
- [35] 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.
- [36] 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.
- [37] 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

- [38] M. Bhardwaj, S. Choudhury, B. Boots, and S. Srinivasa. Leveraging Experience in Lazy Search. In *Robotics: Science and Systems*, 2019.
- [39] T. Bhattacharjee, M.E. Cabrera, A. Caspi, M. Cakmak, and S.S. Srinivasa. A community-centered design framework for robot-assisted feeding systems. In *International ACM SIGACCESS Conference on Computers and Accessibility*, 2019.
- [40] L. Chan, D. Hadfield-Menell, S.S. Srinivasa, and A.D. Dragan. The assistive multi-armed bandit. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2019.
- [41] R. Feng, Y. Kim, G. Lee, E.K. Gordon, M. Schmittle, S. Kumar, T. Bhattacharjee, and S.S. Srinivasa. Robot-assisted feeding: Generalizing skewering strategies across food items on a plate. In *International Symposium on Robotics Research*, 2019.
- [42] D. Gallenberger, T. Bhattacharjee, Y. Kim, and S.S. Srinivasa. Transfer depends on acquisition: Analyzing manipulation strategies for robotic feeding. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2019. **Best Paper Award Winner for Technical Advances in HRI**.
- [43] L. Ke, X. Li, Y. Bisk, A. Holtzman, Z. Gan, J. Liu, J. Gao, Y. Choi, and S.S. Srinivasa. Tactical rewind: Self-correction via backtracking in vision-and-language navigation. In *IEEE Conference on Computer Vision and Pattern Recognition*, 2019. **Oral**.
- [44] R. Kumar, A. Mandalika, S. Choudhury, and S.S. Srinivasa. LEGO: Leveraging experience in roadmap generation for sampling-based planning. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2019.
- [45] P. Lancaster, J.R. Smith, and S.S. Srinivasa. Improved proximity, contact, and force sensing via optimization of elastomer-air interface geometry. In *IEEE International Conference on Robotics and Automation*, 2019.
- [46] G. Lee, Z. Deng, S. Ma, T. Shiratori, S.S. Srinivasa, and Y. Sheikh. Talking with hands 16.2m: A large-scale dataset of synchronized body-finger motion and audio for conversational motion analysis and synthesis. In *International Conference on Computer Vision*, 2019.
- [47] G. Lee, B. Hou, A. Mandalika, J. Lee, S. Choudhury, and S.S. Srinivasa. Bayesian policy optimization for model uncertainty. In *International Conference on Learning Representations*, 2019.
- [48] A. Mandalika, S. Choudhury, O. Salzman, and S.S. Srinivasa. Generalized Lazy Search for Robot Motion Planning: Interleaving Search and Edge Evaluation via Event-based Toggles. In *International Conference on Automated Planning and Scheduling*, 2019. **Best Student Paper Award Winner**.
- [49] S. Niyaz, A. Kuntz, O. Salzman, R. Alterovitz, and S.S. Srinivasa. Optimizing motion-planning problem setup via bounded evaluation with application to following surgical trajectories. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2019.
- [50] V. Roulet, S.S. Srinivasa, D. Drusvyatskiy, and Z. Harchaoui. Iterative Linearized Control: Stable Algorithms and Complexity Guarantees. In *International Conference on Machine Learning*, 2019.



- [51] R. Rowe, S. Singhal, D. Yi, T. Bhattacharjee, and S.S. Srinivasa. Desk organization: Effect of multimodal inputs on spatial relational learning. In *IEEE International Symposium on Robot and Human Interactive Communication*, 2019.
- [52] B. Saund, S. Choudhury, S.S. Srinivasa, and D. Berenson. The blindfolded robot : A bayesian approach to planning with contact feedback. In *International Symposium on Robotics Research*, 2019.
- [53] H. Song, T. Bhattacharjee, and S.S. Srinivasa. Sensing shear forces during food manipulation: Resolving the trade-off between range and sensitivity. In *IEEE International Conference on Robotics and Automation*, 2019.
- [54] T. Weng, L. Perlmutter, S. Nikolaidis, S.S. Srinivasa, and M. Cakmak. Robot object referencing through situated legible projections. In *IEEE International Conference on Robotics and Automation*, 2019.
- [55] 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.
- [56] 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.**
- [57] S. Choudhury, S.S. Srinivasa, and S. Scherer. Bayesian active edge evaluation on expensive graphs. In *International Joint Conference on Artificial Intelligence*, 2018.
- [58] 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.**
- [59] A. Hefny, Z. Marinho, W. Sun, S.S. Srinivasa, and G. Gordon. Recurrent predictive state policy networks. In *International Conference on Machine Learning*, 2018.
- [60] J. Lee, D. Yi, and S.S. Srinivasa. Sampling of pareto-optimal trajectories using progressive objective evaluation in multi-objective motion planning. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2018.
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## Seminars

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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

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### **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

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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

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Member	UW CSE Graduate Admissions Committee	2017-18
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

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### Current

HONDA	2018-21
HONDA Research Institute	\$2,700,000
Title: <i>Formalizing Mathematical Models of Curiosity</i>	
PI	

Office of Naval Research (#ONR N00014-16-R-BA01)	2017-20
Long Range BAA for Navy and Marine Corps Science and Technology	\$2,096,633
Title: <i>Enabling dexterous physics-based manipulation via a learning framework for shared autonomy</i>	
PI	
 RCTA T3	 2017-18
Robotics Collaborative Technology Alliance	\$355,594
Title: <i>Robust Outdoor Mobile Manipulation</i>	
PI	
 Amazon	 2017-18
Amazon Research Award	\$80,000
Title: <i>Data Efficient Policy Search for Reinforcement Learning</i>	
PI	
 National Science Foundation (#1839371)	 2018-21
Division of Mathematical Sciences, the Division of Computing and Communication Foundations, and the Division of Information and Intelligent Systems	\$125,000
Title: <i>Safe Imitation Learning for Robotics</i>	
co-PI, PI: Zaid Harchaoui, UW	
 National Science Foundation (#1748582)	 2017-19
National Robotics Initiative (NRI)	\$453,379
Title: <i>NRI: Collaborative Research: Learning Deep Sensorimotor Policies for Shared Autonomy</i>	
PI, co-PI: Sergey Levine, Berkeley	
 National Science Foundation (#1544797)	 2015-18
Cyber-Physical Systems (CPS)	\$435,928
Title: <i>CPS: Synergy: Collaborative Research: Learning control sharing strategies for assistive cyber-physical systems</i>	
PI, co-PI: Brenna Argall, Northwestern	
 National Science Foundation (#1409003)	 2014-18
Robust Intelligence, Division of Information & Intelligent Systems (IIS)	\$358,737
Title: <i>RI: Medium: The Foundations of a Manipulation Repertoire</i>	
Co-PI, PI: Matt Mason, Co-PI: Michael Erdmann, CMU	
 <b>Past</b>	
 National Institute of Health R01 (#R01EB019335)	 2014-17
Title: <i>A Formalism for Customizing and Training Intelligent Assistive Devices</i>	
PI, co-PI: Brenna Argall, Northwestern	
 Office of Naval Research (#ONR BAA 13-0001)	 2014-17
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.	
 Toyota	 2013-2017
Toyota Motor Engineering & Manufacturing (TEMA)	
Title: <i>Physics-based Intelligent Manipulation in Clutter</i>	
PI	
 Defense Advanced Research Projects Agency	 2015-16
Simplifying Complexity in Scientific Discovery (SIMPLEX)	
Title: <i>An Architecture for Shared Autonomy via Optimal Control</i>	

PI	
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](#))

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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 UW's 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

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- 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