Prof. Siddhartha Srinivasa
Activity Report 2017-18

The Personal Robotics Lab
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Honors and Awards

- IEEE Fellow, 2018
- ICAPS Best Paper Award Winner [9], 2018
- ACM/IEEE HRI Best Paper Award Finalist [3], 2018
- Boeing Endowed Professorship in Computer Science, 2017-∞

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: *MCMC for Asymptotically-optimal Kinodynamic Planning* Now: Researcher, Google

Alumni - Ph.D.

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

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

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

Graduate Interns

Daniel Gallenberger (TU Munich) Spring 2018

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-

Publications (Google Scholar)

Refereed Journals

1. J. Lee, M. X. Grey, S. Ha, T. Kunz, S. Jain, Y. Ye, S. S. Srinivasa, M. Stilman, and C. K. Liu. DART: Dynamic animation and robotics toolkit. *The Journal of Open Source Software*, 3(22):500, feb 2018
2. J. Gammell, T. Barfoot, and S. Srinivasa. Informed sampling for asymptotically optimal path planning. *IEEE Transactions on Robotics*, 2018. (To appear)
3. S. Javdani, H. Admoni, S. Pellegrinelli, S. Srinivasa, and J. 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. Srinivasa. Planning with verbal communication for human-robot collaboration. *ACM Transactions on Human-Robot Interaction*, 2018. (To appear)

Refereed Conferences

1. R. Aronson, T. Santini, T. Kübler, E. Kasneci, S. Srinivasa, and H. Admoni. Eye-hand behavior in human-robot shared manipulation. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2018
2. M. Chen*, S. Nikolaidis*, H. Soh, D. Hsu, and S. Srinivasa. Planning with trust for human-robot collaboration. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2018. **Best Conference Paper Award Finalist**
3. S. Choudhury, S. Srinivasa, and S. Scherer. Bayesian active edge evaluation on expensive graphs. In *International Joint Conference on Artificial Intelligence*, 2018
4. N. Haghtalab, S. Mackenzie, A. Procaccia, O. Salzman, and S. Srinivasa. The Provable Virtue of Laziness in Motion Planning. In *International Conference on Automated Planning and Scheduling*, 2018. **Best Conference Paper Award Winner**
5. A. Hefny, Z. Marinho, W. Sun, S. Srinivasa, and G. Gordon. Recurrent predictive state policy networks. In *International Conference on Machine Learning*, 2018
6. A. Mandalika, O. Salzman, and 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
7. D. Yi, R. Thakker, C. Gulino, O. Salzman, and 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
8. S. Choudhury, S. Javdani, S. Srinivasa, and S. Scherer. Near-optimal edge evaluation in explicit generalized binomial graphs. In *Advances in Neural Information Processing Systems*, 2017
9. S. Choudhury, O. Salzman, S. Choudhury, and S. Srinivasa. Densification strategies for anytime motion planning over large dense roadmaps. In *IEEE International Conference on Robotics and Automation*, 2017
10. S. Choudhury and S. Srinivasa. A bayesian active learning approach to adaptive motion planning. In *International Symposium on Robotics Research*, 2017

11. A. Hefny, Z. Marinho, C. Downey, W. Sun, S. Srinivasa, and G. Gordon. Predictive state models for prediction and control in partially observable environments. In *Conference on Robot Learning*, 2017

12. P. Jin, P. Matikainen, and 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

Reports and Theses

1. B. Calli, A. Singh, J. Bruce, W. W. Aaron, K. Konolige, S. Srinivasa, P. Abbeel, and A. Dollar. Yale-CMU-Berkeley dataset for robotic manipulation research. *The International Journal of Robotics Research (Data Paper)*, 36(3):261–268, 2017

Seminars

Northwestern	2018
Toyota Technological Institute at Chicago	2018
Georgia Tech	2018
Amazon	2018
Microsoft Research	2017

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.

Professional Activities

Board Member	RSS Foundation	2016-
Editor	International Journal of Robotics Research (IJRR)	2014-
	Selected Organization	
Organizer	UW CSE MSR Summer Institute on Social Robotics	2018
Program Chair	Robotics: Science and Systems (RSS)	2017

Grants

Awarded in period

National Science Foundation (#1839371) 2018-21
Title: *Safe Imitation Learning for Robotics*
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

HONDA 2018-21
HONDA Research Institute
Title: *Formalizing Mathematical Models of Curiosity*
PI

Amazon 2017-18
Amazon Research Award
Title: *Data Efficient Policy Search for Reinforcement Learning*
PI

Office of Naval Research (#ONR N00014-16-R-BA01) 2017-20
Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology
Title: *Enabling dexterous physics-based manipulation via a learning framework for shared autonomy*
PI

Ongoing

National Science Foundation (#1748582, $ 453,379) 2017-19
National Robotics Initiative (NRI)
Title: *NRI: Collaborative Research: Learning Deep Sensorimotor Policies for Shared Autonomy*
PI, co-PI: Sergey Levine, Berkeley

National Science Foundation (#1544797, $ 435,928) 2015-18
Cyber-Physical Systems (CPS)
Title: *CPS: Synergy: Collaborative Research: Learning control sharing strategies for assistive cyber-physical systems*
PI, co-PI: Brenna Argall, Northwestern

National Science Foundation (#1409003, $ 1,076,210) 2014-18
Robust Intelligence, Division of Information & Intelligent Systems (IIS)
Title: *RI: Medium: The Foundations of a Manipulation Repertoire*
Co-PI, PI: Matt Mason, Co-PI: Michael Erdmann, CMU

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

References

[1] R. Aronson, T. Santini, T. Kübler, E. Kasneci, S. Srinivasa, and H. Admoni. Eye-hand behavior in human-robot shared manipulation. In *ACM/IEEE International Conference on Human-Robot Interaction*, 2018.

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[13] P. Jin, P. Matikainen, and 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.

[14] J. Lee, M. X. Grey, S. Ha, T. Kunz, S. Jain, Y. Ye, S. S. Srinivasa, M. Stilman, and C. K. Liu. DART: Dynamic animation and robotics toolkit. *The Journal of Open Source Software*, 3(22):500, feb 2018.

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[16] S. Nikolaidis, M. Kwon, J. Forlizzi, and S. Srinivasa. Planning with verbal communication for human-robot collaboration. *ACM Transactions on Human-Robot Interaction*, 2018. (To appear).

[17] D. Yi, R. Thakker, C. Gulino, O. Salzman, and 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.