Stefanie Anne Tellex

CONTACT INFORMATION

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AIM

The aim of my research program is to empower every person with a collaborative robot partner using data-driven decision-theoretic methods.

RESEARCH INTERESTS

Human-robot collaboration, computational linguistics, robotics, machine learning.

EDUCATION

Massachusetts Institute of Technology

Ph.D., Media Arts and Sciences. August, 2010.

- Dissertation Topic: "Natural Language and Spatial Reasoning"
- Committee: Deb Roy (chair), Boris Katz, Yuri Ivanov, Cynthia Breazeal

M.S., Media Arts and Sciences. May 2006.

- Dissertation Topic: "Grounding Language in Spatial Routines"
- Supervisor: Deb Roy

M.Eng., Computer Science. June, 2003.

- Dissertation Topic: "Pauchok: A Modular Framework for Question Answering"
- Supervisor: Boris Katz

S.B., Computer Science. June, 2002.

ACADEMIC POSITIONS

Brown University Computer Science Department

Joukowsky Family Assistant Professor of Computer Science and Assistant Professor of Engineering **July 2017 – present**

Assistant Professor of Computer Science and Assistant Professor of Engineering **September 2013 – present**

MIT Computer Science and Artificial Intelligence Laboratory

Research Scientist **October 2011 – August 2013**

Postdoctoral Research Associate **September 2010 – September 2011**

RESEARCH GRANTS

Amazon Robotics Grant for Robotics Course. (2017). $20,000.

Microsoft Research Faculty Award. (2017). $50,000.

DARPA YFA Director's Fellowship. (2017).

NSF Career Award. Robots That Help People. (2017-2022). $549,437

General Dynamics Land Systems/Army Research Office: Robotics CTA. (co-PI) (2017). $80,000

NSF National Robotics Initiative: A Framework for Hierarchical, Probabilistic Planning and Learning. (co-PI) (2016-2019). $542,682

NASA Early Career Award. (2016-2019). $597,096

NSF: RET: NRI: Collaborative: Jointly Learning Language and Affordances-Supplemental Support. (2016). $9,830

General Dynamics Land Systems/Army Research Office: Robotics CTA: Autonomously Acquiring Models for Verbs in the Field. (2016). $60,000

Sloan Foundation: Stefanie Tellex Sloan Research Fellowship Award. (2016). $55,000

General Dynamics Land Systems/Army Research Office: Robotics CTA: Perception, Human-Robot Interaction. (2015). $50,000

DARPA: Hierarchical, Probabilistic Planning and Learning for Collaboration. (co-PI) (2015). $200,000

DARPA Young Faculty Award. (2015-2018). $664,893

NSF National Robotics Initiative: Jointly Learning Language and Affordances. (co-PI) (2014-2017). $337,792

Richard B. Salomon Faculty Research Award. (2014). Automatically Perceiving Children with RGB-D Sensors. $14,910

Selected Journal Publications

Dilip Arumugam*, Siddharth Karamcheti*, Nakul Gopalan, Edward C. Williams, Mina Rhee, Lawson L.S. Wong, **Stefanie Tellex**. Grounding Natural Language Instructions to Semantic Goal Representations for Abstraction and Generalization. (2018). Autonomous Robots. (*equal contribution) (in press)

Ross A Knepper*, **Stefanie Tellex***, Adrian Li, Nicholas Roy, Daniela Rus. Recovering from failure by asking for help. (2015). Autonomous Robots. (*equal contribution)

Matthew R. Walter, Sachi Hemachandra, Bianca Homberg, **Stefanie Tellex**, Seth Teller. (2014). A Framework for Learning Semantic Maps from Grounded Natural Language Descriptions. International Journal of Robotics Research (Special issue on RSS 2013). 33(9):1167-1190.

Stefanie Tellex, Pratiksha Thaker, Joshua Joseph, Nicholas Roy. (2013). Learning Perceptually Grounded Word Meanings From Unaligned Parallel Data. Machine Learning Journal (Special Issue on Learning Semantics in Machine Learning).

Robin Deits*, **Stefanie Tellex***, Pratiksha Thaker, Dimitar Simeonov, Thomas Kollar, Nicholas Roy. (2013). Clarifying Commands with Information-Theoretic Human-Robot Dialog. Journal of Human-Robot Interaction (Special Issue: Best of HRI Conferences). 2(2): 58-79. Invited paper. (*equal contribution)

Stefanie Tellex*, Thomas Kollar*, Steven Dickerson, Matthew R. Walter, Ashis Gopal Banerjee, Seth Teller, Nicholas Roy. (2011). Approaching the Symbol Grounding Problem with Probabilistic Graphical Models. *AI Magazine*. 32(40): 64-76. (Invited paper) (*equal contribution)

Selected Peer-Reviewed Conference Publications

Melrose Roderick, Christopher Grimm, and **Stefanie Tellex**. Deep abstract q-networks. In Proceedings of the 17th Conference on Autonomous Agents and MultiAgent Systems, 2018. Nominated for Best Student Paper.

Isaiah Brand, Josh Roy, Aaron Ray, John Oberlin, and **Stefanie Tellex**. An Integrated Introduction to Robotics for the Next Generation. In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 2018.

Nakul Gopalan, Dilip Arumugam, Lawson Wong, and **Stefanie Tellex**. Sequence-to-Sequence Language Grounding of Non-Markovian Task Specifications. In Proceedings of Robotics: Science and Systems, Pittsburgh, Pennsylvania, June 2018.

Eric Rosen, David Whitney, Elizabeth Phillips, Gary Chien, James Tompkin, George Konidaris, and **Stefanie Tellex**. Communicating Robot Arm Motion Intent Through Mixed Reality Head-mounted Displays. In International Symposium on Robotics Research, 2017.

David Whitney, Eric Rosen, Elizabeth Phillips, George Konidaris, and **Stefanie Tellex**. Comparing Robot Grasping Teleoperation across Desktop and Virtual Reality with ROS Reality. In International Symposium on Robotics Research, 2017.

Dilip Arumugam, Siddharth Karamcheti, Nakul Gopalan, Lawson L. S. Wong, and **Stefanie Tellex**. Accurately and Efficiently Interpreting Human-Robot Instructions of Varying Granularities. In Robotics: Science and Systems, 2017. (Invited for journal submission.)

John Oberlin and **Stefanie Tellex**. Time-Lapse Light Field Photography for Perceiving Transparent and Reflective Objects. In Robotics: Science and Systems, 2017.

Nakul Gopalan, Marie desJardins, Michael L. Littman, James MacGlashan, Shawn Squire, **Stefanie Tellex**, John Winder, and Lawson L. S. Wong. Planning with abstract Markov decision processes. In International conference on automated planning and scheduling, 2017.

David Whitney, Eric Rosen, MacGlashan James, Lawson Wong, and **Stefanie Tellex**. Reducing Errors in Object-Fetching Interactions through Social Feedback. In International Conference on Robotics and Automation, 2017.

David Whitney, Miles Eldon, John Oberlin, and **Stefanie Tellex**. Interpreting Multimodal Referring Expressions in Real Time. In International Conference on Robotics and Automation, 2016.

John Oberlin and **Stefanie Tellex**. Autonomously acquiring instance-based object models from experience. In International symposium on robotics research (ISRR), 2015.

David Abel, David Ellis Hershkowitz, Gabriel Barth-Maron, Stephen Brawner, Kevin OFarrell, James MacGlashan, **Stefanie Tellex**. (2015). Affordances as Goal-Based Action Priors. International Conference on Planning and Scheduling, Robotics Track. (33% acceptance)

James MacGlashan, Monica Babes-Vroman, Marie desJardins, Michael Littman, Smaranda Muresan, Shawn Squire, **Stefanie Tellex**, Dilip Arumugam, and Lei Yang. (2015). Grounding English Commands to Reward Functions. In Robotics: Science and Systems.

Stefanie Tellex*, Ross Knepper*, Adrian Li, Daniela Rus, and Nicholas Roy. (2014). Asking for Help Using Inverse Semantics. Robotics: Science and Systems. (*equal contribution) (*Best Paper.*) (30% acceptance)

Stefanie Tellex*, Pratiksha Thaker*, Robin Deits, Dimitar Simeonov, Thomas Kollar, Nicholas

Roy. (2012). Toward Information Theoretic Human-Robot Dialog. Robotics: Science and Systems. (34% acceptance) (*equal contribution)

Mario Bollini, **Stefanie Tellex**, Tyler Thompson, Nicholas Roy, Daniela Rus. (2012). Interpreting and Executing Recipes with a Cooking Robot, International Symposium on Experimental Robotics (ISER), Quebec City, Canada.

Stefanie Tellex*, Thomas Kollar*, Steven Dickerson*, Matthew R. Walter, Ashis Gopal Banerjee, Seth Teller, Nicholas Roy. (2011). Understanding Natural Language Commands for Robotic Navigation and Mobile Manipulation. Proceedings of the National Conference on Artificial Intelligence (AAAI), San Francisco, CA. (25% acceptance) (*equal contribution) *Most cited paper from AAAI 2011 on Google Scholar as of 11/26/2015.*

Stefanie Tellex, Thomas Kollar, George Shaw, Nicholas Roy, and Deb Roy. (2010) Grounding Spatial Language for Video Search. Proceedings of the Twelfth International Conference on Multimodal Interfaces and Seventh Workshop on Machine Learning for Multimodal Interaction. (44% acceptance; 25% for oral) (*Best Student Paper.*)

Albert Huang*, **Stefanie Tellex***, Abraham Bachrach*, Thomas Kollar*, Deb Roy, and Nick Roy. (2010) Natural Language Command of an Autonomous Micro-Air Vehicle. Proceedings of the International Conference on Intelligent Robots and Systems (IROS). (46% acceptance) (*equal contribution)

Thomas Kollar*, **Stefanie Tellex***, Deb Roy, and Nick Roy. (2010) Toward Understanding Natural Language Directions. Proceedings of Human Robot Interaction Conference 2010 (HRI-2010). (21% acceptance) (*equal contribution) *Most cited paper from HRI 2010 on Google Scholar as of 11/26/2015.*

Stefanie Tellex and Deb Roy. (2009). Grounding Spatial Prepositions for Video Search. Proceedings of the Eleventh International Conference on Multimodal Interfaces. (36% acceptance) (*Nominated for Best Student Paper.*)

Stefanie Tellex, Boris Katz, Jimmy Lin, Gregory Marton, and Aaron Fernandes. Quantitative Evaluation of Passage Retrieval Algorithms for Question Answering. Proceedings of the 26th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR-2003), July 2003, Toronto, Canada. (*Best Student Paper.*)

Selected Other Publications

John Oberlin and **Stefanie Tellex**. Time-lapse light field photography with a 7 dof arm. In RSS Workshop on Geometry and Beyond Representations, Physics, and Scene Understanding for Robots, 2016.

Nakul Gopalan and **Stefanie Tellex**. Modeling and Solving Human-Robot Collaborative Tasks Using POMDPs. In Robotics: Science and Systems 2015: Workshop on Model Learning for Human-Robot Communication, 2015.

Krishna Aluru, Stefanie Tellex, John Oberlin, and James MacGlashan. Minecraft as an Experimental World for AI in Robotics. In AAAI Fall Symposium, 2015. (*Travel Award.*)

John Oberlin, Maria Meier, Tim Kraska, and **Stefanie Tellex**. Acquiring Object Experiences at Scale. In AAAI-RSS Special Workshop on the 50th Anniversary of Shakey: The Role of AI to Harmonize Robots and Humans, 2015. (*Blue Sky Award.*)

Gabriel Barth-Maron, David Abel, James MacGlashan, and **Stefanie Tellex**. Affordances as transferable knowledge for planning agents. In 2014 AAAI Fall Symposium Series, 2014.

Selected Invited Presentations	CMU Robotics Institute Seminar, 2016.
	Invited Keynote, EMNLP, 2016.
	Invited Keynote, Conference on Robot Learning, 2017.
Students	John Oberlin (Ph.D. 2018)
	Nakul Gopalan (Ph.D. expected 2019)
	David Whitney (Ph.D. expected 2019)
	Xiny (Jason) Liu (Ph.D. expected 2022)
	Thao Nguyen (Ph.D. expected 2022)
	Kaiyu Zheng (Ph.D. expected 2022)
	Eric Rosen (Ph.D. expected 2021)
Awards	RSS Early Career Spotlight. (2018).
	Brown University Research Achievement Award. (2018).
	Best Paper at 1st Workshop on Language Grounding for Robotics, ACL 2017.
	DARPA YFA Directors' Fellowship. (2017).
	NSF Career Award. (2017).
	Foreign Policy Global Thinker. 2016.
	Sloan Fellowship. (2015).
	NASA Early Career Award. (2016).
	Blue Sky Shakey Award, RSS 2015. AAAI-RSS Special Workshop on the 50th Anniversary of Shakey: The Role of AI to Harmonize Robots and Humans.
	DARPA Young Faculty Award, 2015.
	Best Paper, RSS 2014. Asking for Help Using Inverse Semantics.
	Named one of IEEE Intelligent Systems, AI 10 to Watch.
	Richard B. Salomon Faculty Research Award (2014). Automatically Perceiving Children with RGB-D Sensors.
	Best Student Paper, ICMI 2010. Grounding Spatial Language for Video Search.
	Best Student Paper, SIGIR 2003. Quantitative Evaluation of Passage Retrieval Algorithms for Question Answering.

Press Coverage

Welcoming Our New Robotic Overlords. October 23, 2017. The New Yorker.

Meet Iorek, The Robot That Communicates In A Remarkable Way. March 20, 2017. Wired.

Robot Knows The Right Question To Ask When Its Confused, March 15, 2017. IEEE Spectrum.

Robot, Get The Fork Out Of My Sink. Oct 18, 2016. Technology Review.

Robots Can Now Teach Each Other New Tricks. Oct 2017, 2016. MIT Technology Review.

Wired.Co.UK. Stefanie Tellex. Women Who Changed Science in 2015, Dec 23, 2015.

National Public Radio All Things Considered, "How Can Robots Learn New Tasks? Practice, Practice, Practice." 2015.

MIT Technology Review, "How Robots Can Quickly Teach Each Other to Grasp New Objects." 2015.

MIT Technology Review, "Minecraft Shows Robots How to Stop Dithering."

MIT Technology Review, "Robots Can Now Teach Each Other New Tricks." 2015. (Also made Slashdot!)

IEEE Spectrum, "Robots Learning Better Ways to Ask Clueless Humans for Help." 2014.

IEEE Spectrum, "Video Friday: The Year in Robots." 2014.

Providence Science Underground, "Talking to Robots." 2013.

Brown Daily Herald, "CS department purchases robot, plans to program for human assistance." 2013.

Service

Departmental Service: Chair, Undergraduate Research Committee.
Diversity Committee, Ph.D. Admissions Committee, Undergraduate
Recruiting Committee.

Founding organizer of the Northeast Robotic Colloquium (NERC) in 2012
and steering committee member from 2012-present. Organizer for NERC 2012 at MIT, NERC 2014 which was held at Brown University and NERC 2015, held at WPI.
Area Chair for CoRL 2018.
Area Chair for RSS 2017.
Area Chair for RSS 2016.
Families@RSS Organizer for RSS 2017.
Workshop Chair for RSS 2015.
Associate Editor for IROS 2015.
Program Committee for HRI 2015.
Program Committee for 2014 New England Machine Learning Day.
Program Committee for HRI Young Pioneers Workshop.
Associate Editor, IROS 2014.
Associate Editor, ICRA 2014.
Multimodal Grand Challenge Co-Chair, ICMI 2012.