

# Vasanth Sarathy

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<b>CONTACT INFORMATION</b>	Department of Computer Science	<i>email:</i> vasanth.sarathy@tufts.edu
	Human-Robot Interaction Laboratory	<i>website:</i> vsarathy.com
	Tufts University	
	200 Boston Ave., Medford, MA	
<b>EDUCATION</b>	<b>Ph.D., Computer Science and Cognitive Science</b>	Expected Spring 2020
	Tufts University	
	Department of Computer Science	
	Advisors: Matthias Scheutz (C.S.) and Daniel Dennett (Cog.Sci.)	
	<b>Juris Doctor (J.D.)</b>	2007-2010
	Boston University School of Law	
	Member of the Bar in the Commonwealth of Massachusetts	Admitted 2010
	United States Patent and Trademark Office	Admitted 2007
	<b>S.M., Electrical Engineering and Computer Science</b>	2003-2005
	Massachusetts Institute of Technology	
	Advisors: Thomas Keim and Chatham Cooke	
	<b>B.S., Electrical Engineering</b>	1999-2003
<b>AWARDS AND GRANTS</b>	University of Arkansas	
	<i>Summa Cum Laude</i>	
	<b>Finalist NSF 2026 Idea Machine Competition</b>	2019
	National Science Foundation	
	Selected with 32 others out of 800 grant applicants	
	(Winning entries not yet announced)	
	<b>Teaching Fellowship</b>	2019
	Graduate Institute for Teaching (GIFT)	
	Tufts University	
	Amount: \$2000, Training Program	
	<b>John A. Adams &amp; Dorothy M. Adams Graduate Fellowship</b>	2015
	Tufts University, School of Engineering	
	Amount: \$30,000	
	<b>Graduate Student Research Competition</b>	2016
	Tufts University	
	Title: Creative Problem Solving	
	Amount: \$1,000	
	<b>Doctoral Consortia</b>	
	Human-Robot Interaction (HRI), HRI Pioneers	2016
	Knowledge Representation and Reasoning (KR)	2016
	<b>Travel Grants</b>	
	National Science Foundation	2016, 2019
	Tufts University	2015

	<b>Academic Merit Scholarships</b> University of Arkansas Amount: \$1,000 (each year)	2001-2003
	<b>Chancellor's Scholarship</b> University of Arkansas Full tuition, room and board for all four years	1999-2003
<b>RELEVANT EXPERIENCE</b>	<b>Full-Time Ph.D. Research Assistant</b> Tufts University, Department of Computer Science Advisor: Matthias Scheutz	Fall 2015-present
	<b>Conversational Intelligence Summer School</b> University of Massachusetts Lowell, Moscow Institute of Physics and Technology Hosts: Anna Rumshisky, Mikhail Burtsev	June 2019
	<b>Associate</b> Ropes & Gray, LLP, Intellectual Property Group	2005-2013
	<b>Full-Time M.S./Ph.D. Research Assistant</b> Research Laboratory for Electronics M.I.T., Department of Electrical Engineering and Computer Science Advisor: Thomas Keim	2003-2005
	<b>Research Intern</b> Schlumberger Sugar Land Product Center, Resistivity Group Host: Mark Frey	Summer 2003
	<b>Research Intern</b> Schlumberger-Doll Research Center, Real-time Inversion Group Hosts: Smaïne Zeroug, Sandip Bose, Canyon Wang	Summer 2002
	<b>Undergraduate Research Assistant</b> University of Arkansas, Department of Electrical Engineering Advisor: Magda El-Shenawee	2002-2003
<b>JOURNAL ARTICLES (IN PREP)</b>	<p>[J2] <b>Vasanth Sarathy</b>, Marlow Fawn, and Matthias Scheutz. <a href="#">Knowledge Discovery and Creative Problem Solving through Environmental Exploration</a>. <i>Journal of Artificial Intelligence Research</i>, 2020 (in prep)</p> <p>[J1] <b>Vasanth Sarathy</b>, Giordano Ferreira, Emily Sim, Matthias Scheutz, and Kamal Premaratne. <a href="#">Agent-based Simulations of Norm Learning under Epistemic Uncertainty</a>. <i>Autonomous Agents and Multi-Agent Systems</i>, 2020 (in prep)</p>	
<b>JOURNAL ARTICLES</b>	<p>[J5] <b>Vasanth Sarathy</b>, Thomas Arnold, and Matthias Scheutz. <a href="#">When Exceptions Are the Norm: Exploring the Role of Consent in HRI</a>. <i>ACM Transactions on Human-Robot Interaction (Formerly, Journal of Human-Robot Interaction)</i>, 8(3):14:1–14:21, July 2019</p> <p>[J4] Matthias Scheutz, Thomas Williams, Evan Krause, Bradley Oosterveld, <b>Vasanth Sarathy</b>, and Tyler Frasca. <a href="#">An Overview of the Distributed Integrated Affect and Reflection Cognitive DIARC Architecture</a>. In <i>Cognitive Architectures</i>, pages 165–193. Springer, 2019</p>	

- [J3] **Vasanth Sarathy**. [Real World Problem-Solving](#). *Frontiers in Human Neuroscience*, 12, 2018  
**Impact Factor:** 3.2
- [J2] **Vasanth Sarathy** and Matthias Scheutz. [MacGyver Problems: AI Challenges for Testing Resourcefulness and Creativity](#). *Advances in Cognitive Systems*, 6, 2018
- [J1] **Vasanth Sarathy** and Matthias Scheutz. [A Logic-based Computational Framework for Inferring Cognitive Affordances](#). *IEEE Transactions on Cognitive and Developmental Systems*, 10(1):26–43, 2018  
**Impact Factor:** 2.8

**REFEREED  
CONFERENCE  
PROCEEDINGS**

- [C10] **Vasanth Sarathy** and Matthias Scheutz. [On Resolving Ambiguous Anaphoric Expressions in Imperative Discourse](#). In *Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-19)*, 2019 (Oral Presentation)  
**Acceptance rate:** 16.2% (Oral: 3%)
- [C9] Naveen Sundar Govindarajulu, Selmer Bringsjord, Rikhiya Ghosh, and **Vasanth Sarathy**. [Towards the Engineering of Virtuous Machines](#). In *Proceedings of the 2nd AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES-19)*, 2019 (Spotlight Talk)  
**Acceptance rate:** 31.8%
- [C8] **Vasanth Sarathy**. [Learning Context-Sensitive Norms under Uncertainty](#). In *Proceedings of the 2nd AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES-19)*, 2019  
**Acceptance rate:** 31.8%
- [C7] Daniel Kasenberg, **Vasanth Sarathy**, Thomas Arnold, Matthias Scheutz, and Tom Williams. [Quasi-Dilemmas for Artificial Moral Agents](#). In *International Conference on Robot Ethics and Standards*, 2018 (Oral Presentation)
- [C6] Evana Gizzi, Lisa Le Vie, Matthias Scheutz, **Vasanth Sarathy**, and Jivko Sinapov. [Knowledge Acquisition in the Cockpit Using One-Shot Learning](#). In *Proceedings of the 2018 IEEE National Aerospace and Electronics Conference (NAECON)*. 2018
- [C5] **Vasanth Sarathy**, Bradley Oosterveld, Evan Krause, and Matthias Scheutz. [Learning Cognitive Affordances for Objects from Natural Language Instruction](#). In *Proceedings of the Sixth Annual Conference on Advances in Cognitive Systems*, 2018 (Oral Presentation)
- [C4] **Vasanth Sarathy**, Matthias Scheutz, and Bertram Malle. [Learning Behavioral Norms in Uncertain and Changing Contexts](#). In *Proceedings of the 2017 8th IEEE International Conference on Cognitive Infocommunications (CogInfoCom)*, 2017 (Oral Presentation)
- [C3] **Vasanth Sarathy**, Matthias Scheutz, Joseph Austerweil, Yoed Kenett, Mowafak Allaham, and Bertram Malle. [Mental Representations and Computational Modeling of Context-Specific Human Norm Systems](#). In *Proceedings of the 39th Annual Meeting of the Cognitive Science Society*, 2017 (Oral Presentation)  
**Acceptance rate:** 29% [[Robert Glushko Prize](#)]
- [C2] **Vasanth Sarathy** and Matthias Scheutz. [Beyond Grasping - Perceiving Affordances Across Various Stages of Cognitive Development](#). In *Proceedings of the The Sixth Joint IEEE International Conference Developmental Learning and Epigenetic Robotics (ICDL)*, 2016 (Oral Presentation)  
**Acceptance rate:** 28%

- [C1] **Vasanth Sarathy** and Matthias Scheutz. [Cognitive Affordance Representations in Uncertain Logic](#). In *Proceedings of the 15th International Conference on Principles of Knowledge Representation and Reasoning (KR)*, 2016 (Spotlight Talk)  
**Acceptance rate:** 26.9%

## REFEREED WORKSHOP PROCEEDINGS

- [W8] **Vasanth Sarathy** and Matthias Scheutz. [Multiagent Norm Identification: A Belief-Theoretic Approach for Automatically Identifying Explicitly Represented Norms from Observation](#). In *Proceedings of the New England Machine Learning Conference*, 2018
- [W7] **Vasanth Sarathy**. [Real World Problem Solving: How can one's environment influence the cognitive processes underlying creative problem-solving?](#) In *Proceedings of the 5th Meeting of the Society for the Neuroscience of Creativity*, 2018
- [W6] **Vasanth Sarathy** and Matthias Scheutz. [MacGyver Test](#). In *Proceedings of the Sixth Annual Conference on Advances in Cognitive Systems*, 2018
- [W5] Evana Gizzi, Lisa Le Vie, Matthias Scheutz, **Vasanth Sarathy**, and Jivko Sinapov. [A Generalized Framework for Detecting Anomalies in Real-Time Using Contextual Information](#). In *Proceedings of the 2018 IJCAI Workshop on Modeling and Reasoning in Context (MRC)*. 2018
- [W4] **Vasanth Sarathy**, Jason Wilson, Thomas Arnold, and Matthias Scheutz. [Enabling Basic Normative HRI in a Cognitive Robotic Architecture](#). In *Proceedings of the 2nd workshop on Cognitive Architectures for Social Human-Robot Interaction at the 11th ACM/IEEE Conference on Human-Robot Interaction*, 2016
- [W3] **Vasanth Sarathy**. [Inferring Higher-Order Affordances for more Natural Human-Robot Collaboration](#). In *Proceedings of the Human-Robot Interaction (HRI) Pioneers Workshop*, 2016
- [W2] **Vasanth Sarathy** and Matthias Scheutz. [Cognitive Affordance Representations in Uncertain Logic](#). In *Doctoral Consortium at the 15th International Conference on Principles of Knowledge Representation and Reasoning (KR)*, 2016
- [W1] **Vasanth Sarathy** and Matthias Scheutz. [Semantic Representation of Objects and Function](#). In *Proceedings of the 2015 IROS Workshop on Learning Object Affordances*, 2015

## OTHER TALKS AND POSTERS

- Vasanth Sarathy**. [Natural Language Understanding via Commonsense Reasoning](#). In *Machine Intelligence Conference*, 2019
- Vasanth Sarathy**. [Real World Problem Solving](#). In *Graduate Student Research Symposium at Tufts University*, 2018 [[Best Poster](#)]
- Vasanth Sarathy**. [Macgyver Robots](#). In *Graduate Student Research Symposium at Tufts University*, 2016 [[Best Talk](#)]

## TEACHING, ADVISING AND MENTORSHIP

- Teaching*
- Teaching Assistant** Spring 2019  
 Tufts University Department of Computer Science  
 Ethics for AI, Robotics and Human-Robot Interaction
- Teaching Assistant** Spring 2019  
 Tufts University Department of Computer Science  
 Human-Robot Interaction

<b>Teaching Assistant</b>	Spring 2002
University of Arkansas Department of Electrical Engineering	
Electromagnetic Fields and Waves	
<b>Teaching Assistant</b>	Fall 2002
University of Arkansas Department of Electrical Engineering	
Electromechanical Energy Conversion	
<i>Selected Advising and Mentorship</i>	
<b>Undergraduate Research Project Co-Advisor</b>	Summer-Fall 2019
Advisee: Jasmine Falk, Tufts Undergraduate	
Topic: Reasoning in human-human dialog understanding: A corpus analysis	
<b>Undergraduate Research Project Co-Advisor</b>	Summer-Fall 2019
Advisee: Alexander Tsuetaki, Tufts Undergraduate	
Topic: Human-robot study design for evaluating human expectations of robot competencies	
<b>Undergraduate Research Project Co-Advisor</b>	Summer-Fall 2019
Advisee: Marlow Fawn, Tufts Undergraduate	
Topic: Robotic architecture for creative problem solving	
<b>Undergraduate Research Project Co-Advisor</b>	Spring-Fall 2019
Advisee: Howard Kim, Tufts Undergraduate	
Topic: Agent-based simulations for evaluating AI norm learning algorithms	
<b>Tufts Summer Scholars Research Project Co-Advisor</b>	Summer 2018
Advisee: Emily Sim, Tufts Undergraduate	
Topic: Techniques for reducing computational complexity of uncertainty processing	
<b>Undergraduate Research Project Supervisor</b>	2016-2018
Advisees (Tufts Undergraduates): Jacqueline Enderle, Vivian Hong, Mar Freeman, Daniel Atik, Benajamin Machlin, Kennedy Baily, Ballard Blair, Erica Luzzi, and Danish Bhatti	

**Summer Project Supervisor** 2016-2018  
Advisees (High-School students): Connor Coale (Manchester-By-The-Sea), Dhruv Srinivas (Concord Academy), and Jerry Liang (Concord Academy)

**Intellectual Property Law Project Supervisor** 2006-2013  
Advisees (Ropes & Gray): Jason Sussman, Saurabh Gupta, Grace Wang, Caroline Greenwood, Karan Singh, Tan Mau Wu, Laura Zager, Tushar Parlikar, Matthew Bertenthal

**INVITED  
TALKS AND  
GUEST  
LECTURES**

*“Non-monotonic Reasoning for NLP”* Fall 2019\*  
MIT-IBM Watson AI Lab  
IBM Research AI  
Host: David Cox

*“Role of Reasoning in Natural Language Processing”* Fall 2019\*  
Text Machine Laboratory for Natural Language Processing  
University of Massachusetts at Lowell  
Host: Anna Rumshisky

*“Reasoning with Social Norms for Assistive Robotics”* (Guest Lecture) Fall 2019  
Course: Socially Assistive Robotics  
Tufts University  
Host: Elaine Short

*“Reasoning for Natural Language Understanding”* Fall 2019  
Machine Learning Lab  
Tufts University  
Host: Liping Liu

*“Interval Uncertainty and Dempster-Shafer Theory”* Fall 2019  
Automated Systems and Robotics Lab  
Tufts University  
Host: Jason Rife

*“The Ethics of Conversational AI”* (Guest Lecture) Spring 2019  
Course: Ethics of AI, Robotics and Human-Robot Interaction  
Tufts University  
Host: Thomas Arnold

*“Beyond Bayesian: Modeling Uncertainty in Cognitive Science”* Spring 2019  
NeuroCognition of Language Lab  
Tufts University, Massachusetts General Hospital  
Host: Gina Kuperberg

**PROFESSIONAL  
SERVICE**

*Referee Service*  
Journal of Artificial Intelligence Research (JAIR), AAI, AAMAS, HRI, ICDL, IROS,  
AAAI Fall Symposium

*Workshop Organization*

**Program Committee Co-Chair**

Human-Robot Interaction (HRI) Pioneers Workshop

2016-2017

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\*Scheduled in November 2019

	<b>Grant Review Committee</b> Graduate Student Research Competition Tufts University	Fall 2017
<b>PUBLIC OUTREACH</b>	<i>Talks</i> TEDx Tufts - “MacGyver Machines” Taste of Science - “Common Sense is not Common...Especially Among Robots” Cambridge Science Festival - “What would MacGyver Do?”	2019 2018 2016
	<i>Community Engagement</i> Hawken School (OH) - Consulting for Curriculum Development Medford High School (MA) - Mentor, Reverse Science Fair Judge The Creativity Post - Invited Blog Post City of Boston (MA) - Robot Block Party Volunteer Tufts Community Day - Volunteer M.I.T./Sidney-Pacific - Chair Comm. on Scholarly Interaction Univ. of Arkansas/Eta Kappa Nu - President	2018-present 2017-present 2018 2017 2016 2004-2005 2002-2003
<b>SELECTED PRESS</b>	<i>Quoted:</i> Two Tufts Researchers in National Science Foundation Big Ideas Competition. Tufts Now. <a href="https://now.tufts.edu/articles/two-tufts-researchers-nsf-big-ideas-competition">https://now.tufts.edu/articles/two-tufts-researchers-nsf-big-ideas-competition</a>  <i>Interviewed:</i> Get Uncomfortable - The Value of Real World Problems Episode 9. Redesigning School Podcast. <a href="http://redesigningschool.org/the-pod/">http://redesigningschool.org/the-pod/</a>  <i>Quoted:</i> AI is Smart. Can we Make it Kind? Tufts Magazine <a href="https://tuftsmagazine.com/issues/magazine/2019/spring/ai-smart-can-we-make-it-kind">https://tuftsmagazine.com/issues/magazine/2019/spring/ai-smart-can-we-make-it-kind</a>	 June 2019   May 2019  Spring 2019
<b>SKILLS</b>	<b>Computer</b> Languages: Java, Python, Prolog, Answer Set Programming Deep Learning/ ML: PyTorch, Tensorflow, scikit-learn Robotics: ROS Cognitive Systems: DIARC, SOAR, ACT-R Misc: vim, bash, L <sup>A</sup> T <sub>E</sub> X, git  <b>Languages</b> Hindi (proficient/fluent) Tamil (proficient/fluent oral, beginner written)  <b>Graduate Courses</b> Human-Robot Interaction, Ethics of AI, Robots and Human-Robot Interaction, Cognitive Neuroscience, Cognitive Psychology, Experimental Design, Theory of Computation, Cognitive Science of Human Communication, Philosophical Foundations of Cognitive Science, Machine Learning, Computational Models in Cognitive Science, Cognitive Science of Language	
<b>INTERESTS</b>	<b>Cartooning and Visual Art</b> ELSA Moot Court Exhibition - World Trade Organization The Record - B.U. Law Alumni Magazine Legally Drawn ( <a href="http://www.legallydrawn.com">www.legallydrawn.com</a> )	2017 2010 2008-2012