Vasanth Sarathy

CONTACT INFORMATION

Department of Computer Science
Human-Robot Interaction Laboratory
Tufts University
200 Boston Ave., Medford, MA

email: vasanth.sarathy@tufts.edu
website: vsarathy.com

EDUCATION

Ph.D., Computer Science and Cognitive Science — Expected Spring 2020
Tufts University
Department of Computer Science
Advisors: Matthias Scheutz (C.S.) and Daniel Dennett (Cog.Sci.)

Juris Doctor (J.D.) — 2007-2010
Boston University School of Law
Member of the Bar in the Commonwealth of Massachusetts — Admitted 2010
United Stated Patent and Trademark Office — Admitted 2007

S.M., Electrical Engineering and Computer Science — 2003-2005
Massachusetts Institute of Technology
Advisors: Thomas Keim and Chatham Cooke

B.S., Electrical Engineering — 1999-2003
University of Arkansas
Summa Cum Laude

AWARDS AND GRANTS

Finalist NSF 2026 Idea Machine Competition — 2019
National Science Foundation
Selected with 32 others out of 800 grant applicants
(Winning entries not yet announced)

Teaching Fellowship — 2019
Graduate Institute for Teaching (GIFT)
Tufts University
Amount: $2000, Training Program

John A. Adams & Dorothy M. Adams Graduate Fellowship — 2015
Tufts University, School of Engineering
Amount: $30,000

Graduate Student Research Competition — 2016
Tufts University
Title: Creative Problem Solving
Amount: $1,000

Doctoral Consortia
Human-Robot Interaction (HRI), HRI Pioneers — 2016
Knowledge Representation and Reasoning (KR) — 2016

Travel Grants
National Science Foundation — 2016, 2019
Tufts University — 2015

Academic Merit Scholarships 2001-2003
University of Arkansas
Amount: $1,000 (each year)

Chancellor's Scholarship 1999-2003
University of Arkansas
Full tuition, room and board for all four years

RELEVANT EXPERIENCE

Full-Time Ph.D. Research Assistant Fall 2015-present
Tufts University, Department of Computer Science
Advisor: Matthias Scheutz

Conversational Intelligence Summer School June 2019
University of Massachusetts Lowell, Moscow Institute of Physics and Technology
Hosts: Anna Rumshisky, Mikhail Burtsev

Associate 2005-2013
Ropes & Gray, LLP, Intellectual Property Group

Full-Time M.S./Ph.D. Research Assistant 2003-2005
Research Laboratory for Electronics
M.I.T., Department of Electrical Engineering and Computer Science
Advisor: Thomas Keim

Research Intern Summer 2003
Schlumberger Sugar Land Product Center, Resistivity Group
Host: Mark Frey

Research Intern Summer 2002
Schlumberger-Doll Research Center, Real-time Inversion Group
Hosts: Smaine Zeroug, Sandip Bose, Canyun Wang

Undergraduate Research Assistant 2002-2003
University of Arkansas, Department of Electrical Engineering
Advisor: Magda El-Shenawee

JOURNAL ARTICLES (IN PREP)

[J2] **Vasanth Sarathy**, Marlow Fawn, and Matthias Scheutz. Knowledge Discovery and Creative Problem Solving through Environmental Exploration. *Journal of Artificial Intelligence Research*, 2020 (in prep)

[J1] **Vasanth Sarathy**, Giordano Ferreira, Emily Sim, Matthias Scheutz, and Kamal Premaratne. Agent-based Simulations of Norm Learning under Epistemic Uncertainty. *Autonomous Agents and Multi-Agent Systems*, 2020 (in prep)

JOURNAL ARTICLES

[J5] **Vasanth Sarathy**, Thomas Arnold, and Matthias Scheutz. When Exceptions Are the Norm: Exploring the Role of Consent in HRI. *ACM Transactions on Human-Robot Interaction (Formerly, Journal of Human-Robot Interaction)*, 8(3):14:1–14:21, July 2019

[J4] Matthias Scheutz, Thomas Williams, Evan Krause, Bradley Oosterveld, **Vasanth Sarathy**, and Tyler Frasca. An Overview of the Distributed Integrated Affect and Reflection Cognitive DIARC Architecture. In *Cognitive Architectures*, pages 165–193. Springer, 2019

[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

CONFERENCE PAPERS (UNDER REVIEW)

[C5] Thomas Arnold, **Vasanth Sarathy**, and Matthias Scheutz. Reining in MacGyver: Can we Responsibly Incentivize Creative AI Behavior? In *Proceedings of We Robot*, 2020

[C4] **Vasanth Sarathy**, Marlow Fawn, and Matthias Scheutz. On Solving Seemingly Impossible Problems. In *Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*, 2020

[C3] **Vasanth Sarathy**, Antonio Roque, Alex Tsuetaki, and Matthias Scheutz. Interpreting Context-Sensitive Indirect Speech Acts using Non-Monotonic Reasoning. In *Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*, 2020

[C2] Nicholas Rabb, **Vasanth Sarathy**, and Matthias Scheutz. Abduction Under Uncertainty in Open World Environments. In *Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*, 2020

[C1] **Vasanth Sarathy**, Giordano Ferreira, Emily Sim, Matthias Scheutz, and Kamal Premaratne. Learning Context-Sensitive Norm Representations under Uncertainty. In *Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*, 2020

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 Interactionat 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

Teaching Assistant Spring 2002
University of Arkansas Department of Electrical Engineering
Electromagnetic Fields and Waves

Teaching Assistant Fall 2002
University of Arkansas Department of Electrical Engineering
Electromechanical Energy Conversion

Selected Advising and Mentorship

Undergraduate Research Project Co-Advisor Summer-Fall 2019
Advisee: Jasmine Falk, Tufts Undergraduate
Topic: Reasoning in human-human dialog understanding: A corpus analysis

Undergraduate Research Project Co-Advisor Summer-Fall 2019
Advisee: Alexander Tsuetaki, Tufts Undergraduate
Topic: Human-Robot Study Design for Evaluating Human Expectations of Robot Competencies

Undergraduate Research Project Co-Advisor Summer-Fall 2019
Advisee: Marlow Fawn, Tufts Undergraduate
Topic: Robotic Architecture for Creative Problem Solving

Undergraduate Research Project Co-Advisor Spring-Fall 2019
Advisee: Howard Kim, Tufts Undergraduate
Topic: Agent-based simulations for evaluating AI norm learning algorithms

Tufts Summer Scholars Research Project Co-Advisor Summer 2018
Advisee: Emily Sim, Tufts Undergraduate
Topic: Techniques for reducing computational complexity of uncertainty processing

Undergraduate Research Project Supervisor 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), AAAI, AAMAS, HRI, ICDL, IROS, AAAI Fall Symposium

Workshop Organization
Program Committee Co-Chair 2016-2017
Human-Robot Interaction (HRI) Pioneers Workshop

*Scheduled in October 2019

Grant Review Committee Fall 2017
Graduate Student Research Competition
Tufts University

PUBLIC OUTREACH

Talks

TEDx Tufts - "MacGyver Machines" 2019
Taste of Science - "Common Sense is not Common...Especially Among Robots" 2018
Cambridge Science Festival - "What would MacGyver Do?" 2016

Community Engagement

Hawken School (OH) - Consulting for Curriculum Development 2018-present
Medford High School (MA) - Mentor, Reverse Science Fair Judge 2017-present
The Creativity Post - Invited Blog Post 2018
City of Boston (MA) - Robot Block Party Volunteer 2017
Tufts Community Day - Volunteer 2016
M.I.T./Sidney-Pacific - Chair Comm. on Scholarly Interaction 2004-2005
Univ. of Arkansas/Eta Kappa Nu - President 2002-2003

SELECTED PRESS

Quoted: Two Tufts Researchers in National Science Foundation
Big Ideas Competition. Tufts Now. June 2019
https://now.tufts.edu/articles/two-tufts-researchers-nsf-big-ideas-competition

Interviewed: Get Uncomfortable - The Value of Real World Problems
Episode 9. Redesigning School Podcast. May 2019
http://redesigningschool.org/the-pod/

Quoted: AI is Smart. Can we Make it Kind? Tufts Magazine Spring 2019
https://tuftsmagazine.com/issues/magazine/2019/spring/ai-smart-can-we-make-it-kind

SKILLS

Computer
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, LaTeX, git

Languages
Hindi (proficient/fluent)
Tamil (proficient/fluent oral, beginner written)

Graduate Courses
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

INTERESTS

Cartooning and Visual Art
ELSA Moot Court Exhibition - World Trade Organization 2017
The Record - B.U. Law Alumni Magazine 2010
Legally Drawn (www.legallydrawn.com) 2008-2012