STEPHANIE ROSENTHAL — CURRICULUM VITAE

www.cs.cmu.edu/~srosenth

Current Position:
Assistant Teaching Professor
Computer Science Department
School of Computer Science
Carnegie Mellon University

RESEARCH INTERESTS

My research at the intersection of AI and human-computer interaction aims to improve the decision-making and performance of intelligent systems by incorporating realistic models of humans into their planning algorithms.

Keywords (alphabetically): Artificial Intelligence (AI), Explainability and Intelligibility, Human-Centered Planning, Human-Computer Interaction, Human-Robot Interaction, Interactive Intelligent Systems, Internet of Things, Machine Learning, Robotics, Scheduling, Task Planning, Trust in Intelligent Systems, Ubiquitous Computing, Uncertainty in AI

EDUCATION

Ph.D. in Computer Science (2012)
Computer Science Department
Carnegie Mellon University, Pittsburgh PA
Dissertation: "Human Modeling and Interaction for Effective Task Autonomy"
Committee: Manuela Veloso (co-chair), Anind K. Dey (co-chair), Manuel Blum, Eric Horvitz (Microsoft Research)

Master of Science in Computer Science (2009)
Computer Science Department
Carnegie Mellon University, Pittsburgh PA

Bachelor of Science in Computer Science (2007)
Double Major in Human-Computer Interaction
Graduated with Honors (Undergraduate Thesis Required)
Thesis Advisor: Anind Dey
Carnegie Mellon University, Pittsburgh PA

EMPLOYMENT

Assistant Teaching Professor (July 2019-Present) at Carnegie Mellon University
Teaching courses in Artificial Intelligence, Autonomous Agents, and Introductory Programming for non-CS majors. Research focusing in two directions. The first on developing models of data science cognitive processes and subsequently explaining alternative techniques to improve work efficiency. The second on developing metrics for evaluating explainability algorithms. [J4] [C28] [C29] [C30] [C31] [C32] [C33] [C34] [C35] [W20]

Assistant Professor of Applied Data Analytics (August 2017-May 2019) at **Chatham University** in Pittsburgh PA
Developed curriculum for a new Data Science and Analytics major, teaching classes including Introduction to Programming, Data Structures and Algorithms, Data Science, Artificial Intelligence, Visualization, Machine Learning, Research Methods, Statistics, Senior Capstone Project course. Research focus on explainability of a variety of AI platforms funded by two grants. [J3] [C25] [C26] [C27] [W15] [W16] [W17] [W18] [W19]

Adjunct Faculty in the School of Computer Science (2015-2019) at **Carnegie Mellon University**
Co-advising with CMU faculty researchers PhD, Masters, and undergraduate students in the areas of AI Explainability, Planning, Scheduling, and Trust. See Software Engineering Institute and Chatham University employment for more information.

Research Team Lead (October 2016 – June 2017) and **Research Scientist** (August 2013 – June 2017)
at the **Software Engineering Institute** (FFRDC) at **Carnegie Mellon University**

Managed team of four researchers. Started and Managed research agenda in the areas of trust in autonomy and human-computer interaction. Successfully funded research agendas with over $2M of federal funding to cover 4 co-advised Masters students (Robotics Institute), and collaborations with 3 PhD students (HCI Institute). Designed and taught workshops in machine learning and predictive analytics to DoD customers. Acted as AI, HCI, and general research method consultant to other projects and groups.
[C17] [C18] [C19] [C20] [C21] [C22] [C23] [C24] [W9] [W10] [W11] [W12] [I2] [I3] [I4] [I5] [I6]

Gizmology (August 2014 - Present)
Designed a 10-week outreach curriculum to teach to elementary school students that teaches engineering, 3D printing, laser cutting, electronics, and some computer science principles through making things. Taught to a combined 120 paying students at Shady Side Academy Junior School, St. Edmunds Academy, and St. Bernard School. www.gizmologylab.com

Visiting Faculty at the **University of Pittsburgh Computer Science Department** (Summer 2014)
Designed curriculum and taught Introduction to Robotics to senior level undergraduates.

Human-Robot Interaction Scientist at **Bossa Nova Robotics** (July 2012- August 2013)
Designed and implemented teleoperation, autonomous obstacle avoidance, and dialog on ballbot platform.
[C15]

Graduate Research Assistant at **Carnegie Mellon University** (2007-2012)
Thesis work performed under Manuela Veloso and Anind K. Dey.
[J1] [J2] [C3] [C4] [C5] [C7] [C8] [C9] [C10] [C11] [C12] [C13] [C16]] [W1] [W2] [W3] [W4] [W5] [W6] [W7] [W8] [T2]

INTERNSHIPS

Research Internship at **Microsoft Research** (Graduate Summer 2011)
Advised by Eric Horvitz and Dan Bohus, investigated the value of gathering information in parallel from multi-modal sources with delays in observations, including problem formalization, tractability analysis, and implementation on a real system.
[C14] [T1]

Research Internship at **National Security Agency** (Graduate Summer 2010)
Developed interfaces to help researchers understand and analyze the content of a file to determine if it contains any malware.

Research Internship at **Intel Research Seattle** (Graduate Summer 2009)
Advised by Daniel Avrahami with Shaun Kane, designed, implemented, and ran a study to understand how a new micro-projection technology attached to a laptop can help users perform manual tasks like tracing, folding, and cutting better.
[C6]

Program Manager Internship at **Microsoft** (Undergraduate Summer 2006)
Designed, wrote specs, drove development/testing, produced user interface, and completed corporate demonstrations of the multi-touch tabletop Surface technology (predecessor to Surface tablet).

Program Manager Internship at **Microsoft** (Undergraduate Summer 2005)
Designed, specified, and drove development for the "print," "save," and "open" menus for the Windows Presentation Foundation SDK.

Undergraduate Research at **Carnegie Mellon University** (2005-2006)
Advised by Prof. Susan Finger to investigate the impact of non-colocation on engineering teams
[C2]

Undergraduate Research at **Carnegie Mellon University** (2005-2006)
Advised by Prof. Reid Simmons to help build the dialog system for Valerie the Roboceptionist.
[C1]

Research Internship at **Naval Research Laboratory** (High School 2002-2003, Undergraduate Summer 2004)
Advised by Alan Schultz, participated in the IJCAI Robot Challenge with robots GRACE and George from NRL, CMU, NASA where I designed robot facial expressions of mood based on how the navigation and speech algorithms were performing.
[I1]

HONORS & AWARDS

FACULTY AWARDS

Wimmer Faculty Fellowship 2020-2021 (Eberly Center for Teaching Excellence at Carnegie Mellon University)

"Who's Next" in Technology and Education August 2018 (The Incline Magazine, Pittsburgh PA)

Future and New AI Educator Award 2018 (AAAI/EAAI) with travel grant

STUDENT'S AWARDS

Summer Undergraduate Research Fellowship 2021 – David Buffkin

Summer Undergraduate Research Fellowship 2021 – Elchanan Haas

Summer Undergraduate Research Fellowship 2020 – Peerat (Poon) Vichivanives

Association for the Advancement of Artificial Intelligence Scholarship 2018 – Jordan Schultz-McArdle (undergraduate)

Human-Robot Interaction Pioneers Workshop 2017 – Rosario Scalise (Masters student, 30% of applications accepted)

GRADUATE AWARDS

Siebel Scholar, Class of 2012 – awarded to 85 top students for academic excellence & leadership from select graduate schools

National Science Foundation Graduate Fellowship (2007)

National Physical Science Consortium Fellowship (National Security Agency Funded) (2007)

Google Anita Borg Scholarship (winner) (2007)

Conference-Funded Student Travel Grants:
AAAI 2011, CHI 2011, HRI 2011, UbiComp 2010, AAMAS 2010, IUI 2010, CHI 2009, AAAI Spring Symp. 2009, HRI 2008

UNDERGRADUATE AWARDS

CRA Outstanding Undergraduate Award (top female winner) (2007)

Judith Resnik Award Honorable Mention (2nd place female researcher at CMU)

Andrew Carnegie Society Scholar (40 selected university-wide) (2007)

Phi Beta Kappa Honors Fraternity (2006)

Microsoft National Female Scholarship (2006)

Phi Kappa Phi Honors Fraternity (2005)

Boeing Leadership Scholarship (2005)

Microsoft Research Academic All-Star (2005)

PUBLICATIONS[1]

REFEREED JOURNAL ARTICLES

[J4] **S. Rosenthal**, P. Vichivanives(S), E. J. Carter(L). "The Impact of Route Descriptions on Human Expectations for Robot Navigation." In Transactions on Human Robot Interaction, to appear 2022.

[J3] R. Scalise(S), S. Li(S), H. Admoni(L), **S. Rosenthal**, S. Srinivasa(L). "Natural language instructions for human–robot collaborative manipulation." In International Journal of Robotics Research, Published online April 11, 2018.

[1] Collaborators (non-students) are denoted by (L), thesis work with advisors by (T), internship advisors by (A), students/post-docs under my supervision by (S), peer students/post-docs advised by my advisors (P), students who I serve on thesis committees of (C), students under the supervision of others by (O). Journal papers are denoted by "J," conference papers with "C," workshop papers with "W," and invited articles by "I". Acceptance rates for conferences provided where data is available.

[J2] **S. Rosenthal**, M. Veloso(T), A.K. Dey(T). "Acquiring Accurate Reponses to Robots' Questions." In *Journal of Social Robotics,* Special Issue on Expectations, Actions, and Intentions, 2012.

[J1] **S. Rosenthal**, M. Veloso(T), A.K. Dey(T). "Is Someone in this Office Available to Help Me? Proactively Seeking Help from Spatially-Situated Humans." In *Journal of Intelligent and Robotic Systems,* Special Issue on Domestic Service Robots in the Real World, 2011.

REFEREED CONFERENCE PUBLICATIONS (acceptance rates listed when available)

[C35] **S. Rosenthal** and T. Chung(L). "The Role of Expertise on Insight Generation from Visualization Sequences." Visual Languages and Human-Centered Computing (VL/HCC**),** September 2022. (acceptance rate 29%)

[C34] M. Mash(S), **S. Rosenthal**, and R. Simmons(L). "Predicting Data Scientist Stuckness." Visual Languages and Human-Centered Computing (VL/HCC), September 2022. (acceptance rate 29%)

[C33] E. Carter(L), L. A. Hiatt(L), **S. Rosenthal**. "You're delaying my task?! Impact of Task Order and Motive on Perceptions of a Robot." ACM/IEEE Conference on Human-Robot Interaction (HRI), March 2022. (acceptance rate 24%)

[C32] M. Mash(S), **S. Rosenthal**, R. Simmons(L). "DSWorkFlow: A Framework for Capturing Data Scientists' Workflows." (Late Breaking Work) ACM Conference on Computer-Human Interaction (CHI), April 2021. (acceptance rate 39%)

[C31] **S. Rosenthal** and T. Chung(L). "Financial Data Validation by Data Scientists versus Accountants." (Extended Abstract) International Conference on Artificial Intelligence and Finance (ICAIF), October 2020.

[C30] **S. Rosenthal** and L. Hiatt(L)**.** "Human-Centered Decision Support for Agenda Scheduling." International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS), May 2020.

[C29] E.J. Carter(L), S. Reig(O), X.Z. Tan(O), G. Laput(L), **S. Rosenthal**, and A. Steinfeld(L). "Death of a robot: Social media reactions and language usage when a robot stops operating." International Conference on Human-Robot Interaction (HRI), March 2020.

[C28] **S. Rosenthal** and T.R. Chung(L). "A Data Science Major: Building Skills and Confidence." ACM Special Interest Group on Computer Science Education (SIGCSE) Technical Symposium, March 2020.

[C27] S. Selvaraj(S), **S. Rosenthal**, M. Veloso(L). "Classifier Labels as Language Grounding for Explanations." Global Conference on Artificial Intelligence (GCAI), August 2018.

[C26] S. Selvaraj(S), **S. Rosenthal**, M. Veloso(L). "Classifier-Based Evaluation of Image Feature Importance." Global Conference on Artificial Intelligence (GCAI), August 2018.

[C25] S. Konam(S), I. Quah(O), **S. Rosenthal**, and M, Veloso(L). **"**Understanding Convolutional Networks with APPLE: Automatic Patch Pattern Labeling for Explanation." *AI, Ethics, and Society* (AIES 2018 in conjunction with AAAI 2018). February 2018.

[C24] J. Ramos Rojas(O), M.B. Kery(O), **S. Rosenthal**, A.K. Dey(L). "Sampling Techniques to Improve Big Data Exploration," *Symposium on Large Data Analysis and Visualization* (in conjunction with IEEE VIS), pgs. 26-35, October 2017.

[C23] S. Li(S), R. Scalise(S), H. Admoni(L), S. Srinivasa(L), **S. Rosenthal**. "Evaluating Critical Points in Trajectories", *Robot-Human Communication* (Ro-Man 2017), pgs. 1357-1364, August 2017.

[C22] S. Shiang(O), **S. Rosenthal**, A. Gershman(L), J. Carbonell(L), J. Oh(L). "Leveraging Language to Improve Object Recognition**",** In Proc. *Thirty-First Conference on Artificial Intelligence* (AAAI 2017), February 2017. (acceptance rate 24%)

[C21] V. Perera(C), S. Selveraj(S), **S. Rosenthal**, M, Veloso(L). "Dynamic Generation and Refinement of Robot Verbalization", *Robot-Human Communication (Ro-Man 2016)*, August 2016.

[C20] K. Baraka(C), **S. Rosenthal**, and M. Veloso(L). "Enhancing Human Understanding of a Mobile Robot's State and Actions using Expressive Lights", *Robot-Human Communication (Ro-Man 2016),* August 2016.

[C19] S. Li(S), R. Scalise(S), H. Admoni(L), **S. Rosenthal**, S. Srinivasa(L). "Spatial References and Perspective in Natural Language Instructions for Collaborative Manipulation", *Robot-Human Communication (Ro-Man 2016),* August 2016.

[C18] **S. Rosenthal**, Sai P. Selvaraj(S), Manuela Veloso(L). "Verbalization: Narration of Autonomous Mobile Robot Experience." in Proc. 26th *International Joint Conference on Artificial Intelligence (IJCAI 2016),* July 2016. (acceptance rate 24%)

[C17] **S. Rosenthal**, S. McMillan(L), M. Gaston(L). "Developer Toolchains for Large-Scale Analytics: Two Case Studies." In Proc. *International Conference on Big Data (Big Data 2015),* October 2015.

[C16] M. Veloso(T), J. Biswas(P), B. Coltin(P), **S. Rosenthal**. "CoBots: Robust Symbiotic Autonomous Mobile Service Robots." In Proc. *International Joint Conference on Artificial Intelligence* (IJCAI 2015), July 2015.

[C15] **S. Rosenthal**, S. Skaff(L), M. Veloso(L), D. Bohus(L), E. Horvitz(L). "Execution Memory for Grounding and Coordination." in Proc. *International Conference on Human Robot Interaction* (HRI 2013), pgs. 213-214, March 2013.

[C14] **S. Rosenthal**, D. Bohus(I), E. Kamar(L), and E. Horvitz(I). "Look vs Leap: Value of Information with Streaming Evidence." in Proc. *23rd International Joint Conference on Artificial Intelligence* (IJCAI 2013), August 2013. (acceptance rate 28%)

[C13] M. Veloso(T), J. Biswas(P), B. Coltin(P), **S. Rosenthal**, T. Kollar(P), C. Mericli(P), M. Samadi(P), S. Brandao(P), and R. Ventura(L). "CoBots: Collaborative Robots Servicing Multi-Floor Buildings." In Proc. of IROS 2012, October 2012.

[C12] **S. Rosenthal**, M. Veloso(T). "Monte Carlo Preference Elicitation for Learning Additive Reward Functions." in Proc. *IEEE Symposium on Robot and Human Interactive Communication* (RO-MAN 2012), pgs. 886-891, September 2012.

[C11] **S. Rosenthal**, M. Veloso(T). "Mobile Robot Planning to Seek Help with Spatially-Situated Tasks." In Proc. *Twenty-Sixth Conference on Artificial Intelligence* (AAAI 2012), pgs. 2067-2073, July 2012. (acceptance rate 26%)

[C10] **S. Rosenthal**, M. Veloso(T), A.K. Dey(T). "Learning Accuracy and Availability of Humans who Help Mobile Robots." In Proc*. Twenty-Fifth Conference on Artificial Intelligence* (AAAI 2011) Special Track on Physically Grounded Artificial Intelligence, August 2011. (acceptance rate 25%)

[C9] **S. Rosenthal**, M. Veloso(T). "Modeling Humans as Observation Providers using POMDPs." In Proc*. International Symposium on Robot-Human Communication* (Ro-Man 2011), July 2011.

[C8] **S. Rosenthal**, A.K. Dey(T), M. Veloso(T). "Using Decision-Theoretic Experience Sampling to Build Personalized Mobile Phone Interruption Models." In Proc. *International Conference on Pervasive Computing* (Pervasive 2011), pp. 170-187. June 2011. (acceptance rate 24%)

[C7] **S. Rosenthal.** "Modeling Users of Intelligent Systems." ACM *CHI Conference on Human Factors in Computing Systems Doctoral Consortium (CHI 2011),* May 2011.

[C6] **S. Rosenthal**, S.K. Kane(O), J.O. Wobbrock(L), D. Avrahami(I). "Augmenting On-Screen Instructions with Micro-Projected Guides: When it Works, and When it Fails." In Proc. *ACM International Conference on Ubiquitous Computing* (UbiComp 2010), pp. 203-212. September 2010. (acceptance rate 19%)

[C5] **S. Rosenthal**, J. Biswas(P), M. Veloso(T). "An Effective Personal Mobile Robot Agent Through Symbiotic Human-Robot Interaction." in Proc. *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS 2010), pp. 915-922. May 2010. (acceptance rate 24%)

[C4] **S. Rosenthal** and A.K. Dey(T). "Towards Maximizing the Accuracy of Human-Labeled Sensor Data" in Proc. *International Conference on Intelligent User Interfaces* (IUI 2010), pp. 259-268. February 2010. (acceptance rate 30%)

[C3] **S. Rosenthal**, A.K. Dey(T), M. Veloso(T). "How Robots' Questions Affect the Accuracy of the Human Responses" in Proc. *International Symposium on Robot-Human Interactive Communication* (Ro-Man 2009), pp. 1137-1142, September 2009. (acceptance rate 40%)

[C2] **S. Rosenthal** and S. Finger. "Design Collaboration in a Distributed Environment." in Proc. *Frontiers in Education* (FIE 2006), pp. M2G-13 - 18. October 2006.

[C1] R. Kirby, F. Broz, J. Forlizzi, M.P. Michalowski, A. Mundell, **S. Rosenthal**, B.P. Sellner, R. Simmons, K. Snipes, A. Schultz, and J. Wang. "Designing Robots for Long-Term Social Interaction." in Proc. *International Conference on Intelligent Robots and Systems* (IROS 2005), pp. 1338 - 1343. August 2005. (acceptance rate 55%)

REFEREED WORKSHOP PUBLICATIONS

[W20] **S. Rosenthal** and E.J. Carter(L). "Impact of Explanation on Trust of a Novel Mobile Robot." AAAI Fall Symposium Series: Artificial Intelligence for Human-Robot Interaction. November, 2020.

[W19] **S. Rosenthal**. "Anonymity and Linguistic Obfuscation." Workshop on Deception and Artificial Intelligence, August 2018.

[W18] S. Selvaraj(S), **S. Rosenthal**, M. Veloso(L). "Vision-Based Robot State Explanation". *Workshop on Explainable Robots, Human Robot Interaction (HRI),* March 2018.

[W17] E. Avrunin(S), **S. Rosenthal**, R. Simmons(L). "Coverage-Based Policy Explanations". *Workshop on Explainable Robots, Human Robot Interaction (HRI),* March 2018.

[W16] **S. Rosenthal** and T.R. Chung[(L)]. MDP-Based Algorithms and Explanation-Based Trust for Cybersecurity Detection. *AIS Special Interest Group on Information Security and Privacy (SIGSEC) Workshop on Information Security and Privacy* (jointly hosted with IFIP TC 11.1 WISP), December 2017.

[W15] **S. Rosenthal** and T. R. Chung[(L)], T. R. Data Analytics Curriculum with Dynamic Data Collection Platforms. 2017 Pre-ICIS SIGDSA Symposium, December 2017.

[W14] S. Konam[(S)], B.J. Lengerich[(O)], E.P. Xing[(L)], **S. Rosenthal**, M. Veloso[(L)]. "Towards Visual Explanations for Convolutional Neural Networks via Input Resampling", *Workshop on Visualization for Deep Learning, Thirty-fourth International Conference on Machine Learning (ICML 2017)*, August 2017.

[W13] R. Scalise[(S)], **S. Rosenthal**, S. Srinivasa[(L)]. "Natural Language Explanations in Human-Collaborative Systems". Pioneers Workshop, Human-Robot Interaction (HRI 2017), March 2017.

[W12] S. Konam[(S)], **S. Rosenthal** and M. Veloso[(L)]. "UAV and Service Robot Coordination for Indoor Object Search Tasks". International Joint Conference on Artificial Intelligence Workshop on Autonomous Mobile Service Robots. July 2016.

[W11] S. Li[(S)], R. Scalise[(S)], H. Admoni[(L)], S. Srinivasa[(L)], **S. Rosenthal**. "Clarity of Perspective in Spatial Language Instructions". Robotics: Science and Systems, June 2016.

[W10] **S. Rosenthal.** "Why did the Robot do that? Explainability of Robot Plans." Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium on AI and HRI, November 2015.

[W9] **S. Rosenthal**, A. Mellinger[(L)], D. Shepard[(L)], E. Werner[(L)], M. Gaston[(L)]. Association for the Advancement of Artificial Intelligence (AAAI) Spring Symposium on Cognitive Security, March 2014.

[W8] **S. Rosenthal**, M. Veloso[(T)], A.K. Dey[(T)]. "Task Behavior and Interaction Planning for a Mobile Service Robot that Occasionally Requires Help," Workshop on Automated Action Planning for Autonomous Mobile Robots, *Twenty-Fifth Conference on Artificial Intelligence* (AAAI 2011), August 2011.

[W7] M. Veloso[(T)], **S. Rosenthal**, R. Ventura[(L)], B. Coltin[(P)], J. Biswas[(P)]. "Autonomous Mobile Service Robots for Humans, With Human Help, and Enabling Human Remote Telepresence. Workshop on Human Robot Interaction, Robotics Science and Systems (RSS 2011), July 2011.

[W6] **S. Rosenthal**, M. Veloso[(T)], A.K. Dey[(T)]. "Hello? Is Someone in this Office Available to Help Me? Proactively Seeking Help from Spatially-Situated Humans." Young Pioneers Workshop, Human Robot Interaction (HRI 2011), March 2011.

[W5] **S. Rosenthal**, M. Veloso[(T)]. "Mixed-Initiative Long-Term Interactions with an All-Day-Companion Robot." Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium on Dialog with Robots, November 2010.

[W4] **S. Rosenthal**, M. Veloso[(T)]. "Using Symbiotic Relationships with Humans to Help Robots Overcome Limitations." Workshop on Collaborative Human/AI Control for Interactive Experiences (CHACIE), International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2010), May 2010.

[W3] **S. Rosenthal**, A.K. Dey[(T)], M. Veloso[(T)]. "Using Interaction to Improve Intelligence: How Intelligent Systems Should Ask Users for Input." Workshop on Intelligence and Interaction, International Joint Conference on Artificial Intelligence (IJCAI 2009), July 2009.

[W2] **S. Rosenthal**, M. Veloso[(T)], A.K. Dey[(T)]. "Online Selection of Mediated and Domain-Specific Predictions for Improved Recommender Systems." Workshop on Intelligent Techniques in Web Personalization and Recommender Systems, International Joint Conference on Artificial Intelligence (IJCAI 2009) July 2009.

[W1] **S. Rosenthal**, M. Veloso[(T)], A.K. Dey[(T)]. "Asking Questions and Developing Trust." Association for the Advancement of Artificial Intelligence (AAAI) Spring Symposium on Agents that Learn from Humans Teachers, March 2009.

STUDENT TECHNICAL REPORTS and THESES

[T6] Sai Prabhakar Pandi Selvaraj. *Verbalization of Service Robot Experience as Explanations in Language Including Vision-Based Learned Elements.* Master's Thesis, Tech. Report, CMU-RI-TR-17-53, Robotics Institute, Carnegie Mellon University, August, 2017.

[T5] Sandeep Konam. *Vision-Based Navigation and Deep Learning Explanation for Autonomy*. Master's Thesis, Tech. Report, CMU-RI-TR-17-27, Robotics Institute, Carnegie Mellon University, May 2017.

[T4] Rosario Scalise. *Human-Centered Design of Robot Explanations*. Master's Thesis, Tech. Report, CMU-RI-TR-17-12, Robotics Institute, Carnegie Mellon University, May 2017.

[T3] Shen Li. *Automatically Evaluating and Generating Clear Robot Explanations.* Masters Thesis, Tech. Report, CMU-RI-TR-17-09, Robotics Institute, Carnegie Mellon University, May, 2017.

TECHNICAL REPORTS and THESES

[T2] **S. Rosenthal**. "Human-Centered Planning for Effective Task Autonomy" PhD Thesis, 2012. CMU-CS-12-110

[T1] **S. Rosenthal**, D. Bohus[(I)], and E. Horvitz[(I)], 2012. Value of Information with Streaming Evidence, Microsoft Research Technical Report, MSR-TR-2012-99.

INVITED ARTICLES

[I6] **S. Rosenthal**. "Why did the robot do that?" Software Engineering Institute Year in Review 2017.

[I5] **S. Rosenthal**. "Why did the robot do that?" Software Engineering Institute Blog post. December 5 2016.
5th most popular SEI Blog Post in 2016
Post picked up by YCombinator's Hacker News and Reddit's Robotics Subreddit

[I4] **S. Rosenthal** and Jeffrey O. Kephart[(L)]**.** "Reports of the 2016 AAAI Workshops – Symbiotic Cognitive Systems (WS-16-14)". *AAAI Magazine.* April 2016.

[I3] **S. Rosenthal.** "Predictive Analytics Guide." Cyber Intelligence Research Consortium. February 2015.

[I2] E. Werner[(L)], S. McMillan[(L)], and **S. Rosenthal**. "Big Ideas for Big Data: Hardware, Software, Analysis, and Teaching for Graph Analytics." Software Engineering Institute Year in Review 2014.

[I1] R. Simmons, *et. al.* "GRACE and GEORGE: Autonomous Robots for the AAAI Robot Challenge". *Mobile Robot Competition 2003, AAAI Magazine*, pp. 52–62. August 2003.

RESEARCH GRANTS

JP Morgan Faculty Fellowship 2020
Timely Suggestions for Improving Data Analyst Cognitive Workflows
Investigators: Stephanie Rosenthal and Reid Simmons
Period:2020-2021
Amount: $150,000

Association of Certified Fraud Examiners
Machine Learning from Human Demonstration: Applications for Fraud Investigation
Investigators: Stephanie Rosenthal and Rachel Chung
Period:2019-2020
Amount: $10,000

JP Morgan Faculty Fellowship 2019
Learning and Explaining the Differences Between Novice and Expert Data Analysts
Investigators: Stephanie Rosenthal and Reid Simmons
Period:2019-2020
Amount: $150,000

Software Engineering Institute (FFRDC Air Force Funded) Research Collaboration 2018
Robot Trust and Pattern Detection
Investigators: Drew Gifford (CMU SEI), Stephanie Rosenthal (Chatham, CMU)
Period: 2018-2020
Amount: $225,000

National Security Agency, Subcontract 2018
Detecting Patterns in Online Behavior
Investigators: David Garlan (CMU), Stephanie Rosenthal (Chatham), Rachel Chung (Chatham)
Period: 2018
Amount: $137,498

Software Engineering Institute LINE Funding 2017
What will the Robot do Next?
Investigators: Stephanie Rosenthal (PI), Siddhartha Srinivasa (CMU RI), Laura Hiatt (Naval Research Lab)
Period: 2016-2018
Amount: $500,000

Software Engineering Institute LENS Funding 2016
Software Engineering Best Practices for Additive Manufacturing
Investigators: Stephanie Rosenthal (PI), Scott Hudson (CMU HCII), Jennifer Mankoff (CMU HCII), Kurt Wallnau (CMU SEI), Rick Kazman (CMU SEI and UHawaii)
Period: 2015-2016
Amount: $350,000

Software Engineering Institute LINE Funding 2016
Data Validation for Large-Scale Analytics
Investigators: Stephanie Rosenthal (PI), Anind K. Dey (CMU HCII)
Period: 2015-2016
Amount: $350,000

Software Engineering Institute LINE Funding 2016
Why did the Robot do that?
Investigators: Stephanie Rosenthal (PI), Siddhartha Srinivasa (CMU RI), Manuela Veloso (CMU MLD), Joshua Peschel (Senformatics, Iowa State)
Period: 2015-2017
Amount: $1.5M

PROFESSIONAL SERVICE

GUEST EDITOR

2018 Transactions on Human-Robot Interaction (THRI) Special Issue on Artificial Intelligence for Human-Robot Interaction (AI-HRI) with Bradley Hayes and Maya Cakmak

ASSOCIATE EDITOR

Transactions on Human-Robot Interaction (THRI) (2018-Present)

PROGRAM COMMITTEES

Autonomous Agents and Multi-Agent Systems (AAMAS) (Program Committee 2017, 2018, 2020)

Association for the Advancement of Artificial Intelligence (AAAI) (2016, 2017, Senior Program Committee AAAI 2018)

Human-Robot Communication (Ro-Man) (Organizing Committee Publicity Co-Chair and Associate Editor Program Committee 2017)

Human-Robot Interaction (HRI) (Young Pioneers Workshop 2017-2022, Program Committee 2018, 2022)

International Joint Conference on Artificial Intelligence (IJCAI) (Senior Program Committee 2016, Program Committee 2017, 2018)

Robotics: Science and Systems (RSS 2017)

WORKSHOPS

Robots: Science and Systems Pioneers Workshop (2020)

Intelligent User Interfaces Workshop on Explainable AI (IUI) (2019, 2020)

Closing the Cognitive Loop: Third Workshop on Knowledge, Data, and Systems for Cognitive Computing (IJCAI 2016)

Human-Robot Interaction for Small and Personal Unmanned Aerial Vehicles Workshop (RSS 2016)

Interactive Machine Learning Workshop (IUI 2013)

Agents that Learn Interactively from Human Teachers (IJCAI 2011)

Student Conference Volunteer
Ubicomp 2010, Autonomous and Multi-Agent Systems 2010, Computer-Human Interaction (CHI) 2009

REFEREE SERVICE

IEEE Transactions on Robotics (T-RO)

Journal of Artificial Intelligence Research (JAIR)

Artificial Intelligence Journal (AIJ)

International Journal of Robotics Research (IJRR)

IEEE Ro-Man 2011, 2012, 2021

AAMAS 2017, 2018, 2020, 2022

RSS 2017, 2020

ACM CHI 2011, 2014, 2016, 2020, 2022

IEEE ICRA 2010, 2012, 2016, 2020

HAI 2019

AAAI 2014, 2015, 2016, 2017, 2018

ACM HRI 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018. 2022

ICAPS 2018

IJCAI 2015, 2016, 2017, 2018

ACM UIST 2016

IEEE IROS 2009, 2010, 2011, 2013, 2014

ACM Ubiquitous Computing 2010, 2011

Pervasive 2011

WORKSHOP ORGANIZATION

AAAI 2016 Workshop on Symbiotic Cognitive Systems with Jeffrey Kephart (IBM) and Manuela Veloso (CMU MLD)

UNIVERSITY SERVICE

Academic Review Board (2020-Present)

University Disciplinary Committee (2020-Present)

SCS Committee for Internal Appointments, co-Chair (2020-Present)

AI Curriculum Review Committee (2020-Present)

Judith Resnick Award Committee (2019 - Present)

AI Maker Space committee (2019-2020)

Data Science major and minor co-coordinator (Chatham, 2017-2019)

Institutional Review Board (IRB) Member (Chatham, 2018-2019)

Computer Science PhD Graduate Admissions Committee (Carnegie Mellon, 2011)

Admission Visit Weekend (Carnegie Mellon, 2008 - 2011)
Acted as Student Contact, Graduate Student Panelist, and helped plan dinner events for the admitted students to the Computer Science Department

Undergraduate Review Committee (Carnegie Mellon, 2005 – 2007)
Served as inaugural undergraduate member of the undergraduate curriculum with 7 faculty, helped redefine the curriculum of the introductory courses based on feedback from the faculty and students

MEMBERSHIPS

Association for Computing Machinery (ACM)
Association for the Advancement of Artificial Intelligence (AAAI)
Institute for Electrical and Electronics Engineers (IEEE)

ADVISING

POSTDOCTORAL FELLOWS

Moshe Mash (2019-2021)
Co-advised with Reid Simmons

GRADUATE ADVISEES

Peerat Vichivanives (2022-2023)
Masters in Computer Science
[J4]

Eleanor Avrunin (2018)
PhD in Robotics, co-advised with Reid Simmons
[W17]

Sandeep Konam (2015 - 2017)
Masters in Robotics, co-advised with Manuela Veloso
[C23][W12][W14]

Shen Li (2015 - 2017)
Masters in Robotics, co-advised with Siddhartha Srinivasa
[C19][W11]

Rosario Scalise (2015 - 2017)
Masters in Robotics, co-advised with Siddhartha Srinivasa
[C19][W11][W13]

Sai Selvaraj (2015 – 2017)
Masters in Robotics, co-advised with Manuela Veloso
[C18][C21][W18]

UNDERGRADUATE RESEARCH ADVISEES

Alexander Ellis (Spring 2022, Summer 2022)

Ruijia Xing (Spring 2022, Summer 2022)

Mindee Lai (Spring 2022)

Shreya Manjunath (Spring 2022)

Mehda Palavalli (Spring 2022)

Emma Parrella (Spring 2022)

Peerat (Poon) Vichivanives (Spring/Summer/Fall 2020, Spring/Fall 2021, Spring 2022)

Elchanan Haas (Summer 2021)

David Buffkin (Spring, Summer 2021)

Arnav Gupta (Summer, Fall 2020)

Anirban Chowdhury (Spring 2020, with Reid Simmons and Moshe Mash)

Elizabeth Finneran (Spring 2020)

Victoria Kalinovich (Spring 2020, with Reid Simmons and Moshe Mash)

Juliette Wong (Spring 2020)

Alex Mendelsohn (Summer 2018)

Simon Mendelsohn (Summer 2018)

Anh Nguyen (Summer 2018)

Mhd Youssef Aljabi (Spring 2018)

Ajay Benno (Spring and Fall 2016, Spring 2017)

Jason Ma (Spring and Fall 2016, Spring 2017)

Raghav Goyal (Fall 2015)

CAPSTONE ADVISEES

Information Systems and Business Capstone Groups (3) (Fall 2017)

HCI Capstone Group (Spring 2013)

THESIS COMMITTEE MEMBER

Vittorio Perera (PhD, Defended 2018)
[C21]

Kim Baraka (Masters in Robotics, May 2016)
[C20]

UNIVERSITY TEACHING

Carnegie Mellon University (Spring 2019 – Present)
*Personal teaching scores reported

FALL 2022
Artificial Intelligence: Knowledge Representation and Reasoning

SPRING 2022
Artificial Intelligence: Knowledge Representation and Reasoning (FCE 4.19/5.0)

FALL 2021
Autonomous Agents (FCE 4.8/5.0)
Artificial Intelligence: Knowledge Representation and Reasoning (FCE 4.25/5.0)

SPRING 2021
Graduate Artificial Intelligence (FCE 4.17/5.0)

FALL 2020
Autonomous Agents (FCE 4.88/5.0)
Artificial Intelligence: Knowledge Representation and Reasoning (FCE 3.95/5.0)

SPRING 2020
Artificial Intelligence: Knowledge Representation and Reasoning (FCE 4.32/5.0)

FALL 2019
Autonomous Agents (FCE 4.25/5.0)
Principles of Computing (FCE 4.21/5.0)

SPRING 2019
Artificial Intelligence: Knowledge Representation and Reasoning

Chatham University (Fall 2017 – Spring 2019)

SPRING 2019
Introduction to Data Science (FCE 5.0/5.0)
Machine Learning and Artificial Intelligence (FCE 5.0/5.0)
Senior Business Capstone (FCE 5.0/5.0)
Senior Data Science Capstone (not collected)

FALL 2018
Introduction to Programming (not collected)
Data Visualization and Communication (FCE 4.3/5.0)

SPRING 2018
Introduction to Data Science (FCE 4.67/5.0)
Introduction to Statistics (FCE 3.46/5.0)

Data Structures and Algorithms (Independent Study)
Artificial Intelligence (Independent Study)

FALL 2017
Introduction to Programming (FCE 3.41/5.0)
Research Methods (FCE 3.76/5.0)
Senior Business Capstone Project course (3.33/5.0)

Introduction to Robotics, Visiting Faculty at University of Pittsburgh (Summer 2014)
Designed and taught 12 week summer course covering topics including open loop control, sensing, AI and planning, and multi-robot algorithms. Assignments were implemented on Turtlebot2 robots with Kinects for sensing.
Teaching evaluations not performed for summer classes.

Predictive Analytics, Workshop for Department of Defense (November 2013, November 2014)
Designed and taught class and hands-on practicum focusing on the important basic principles of predictive and big data analytics including exploratory data analysis, visualization, machine learning, natural language processing, graph analytics, ensemble methods, testing and training techniques, and the current challenges that are faced during implementation
Met or exceeded expectations for 38 of 40 participants, remaining 2 had not met class prerequisites

Teaching Assistant for **CMRoboBits** (Fall 2008)
Project course for students to implement algorithms on iRobot Create robots. Graded weekly demonstrations on the robots and held office hours to help students between demo days

Teaching Assistant for **Data Structures and Algorithms** (Summer 2008)
Course for practical application, design and analysis of fundamental algorithms and data structures. Held recitations 2 times per week and office hours, helped design and grade assignments and exams.

Course Assistant for **Principles of Computation** (Spring 2007)
Introductory course on theoretical foundations of computer science (no programming) for non-CS majors. Held office hours and graded assignments and exams, taught review sessions before exams.

Course Assistant for **Effective Programming for C and UNIX** (Fall 2006)
Course to teach the C language basics of pointers, memory addressing, copying and moving memory, etc. Held office hours and graded assignments and exams.

OUTREACH, MENTORING and GRADE SCHOOL TEACHING

CARNEGIE MELLON UNIVERSITY

Ask Your Professor with SCS4ALL (2020)
Interactive panel session with students asking professors questions

Apple Pie with Alpha Chi (2019)
Invited to speak to Alpha Chi Omega as a professor the students admired

WOMEN@SCS AT CARNEGIE MELLON UNIVERSITY

Women Faculty Invited Lunch (2020)
Interactive session with female students on topics ranging from research and industry, grad school, and work-life balance

Big Sister/Little Sister (2007 – 2012)
Matched with an undergraduate woman in computer science to mentor and answer questions about research, internships, graduate school, and any other questions she has about careers in CS

School of Computer Science Day (Carnegie Mellon, Workshop Chair 2006, General Chair 2007, 2008)
Planned all-day workshops, art show, and talent show for undergraduate, graduate, faculty, and staff of the School of Computer Science to celebrate the diversity of the community

Creative Technology Nights (2005 – 2012, http://women.cs.cmu.edu/technights/)
Develop and teach free workshops including sewing circuits, robotics, HCI design for middle school girls in Pittsburgh to learn about different aspects of computer science

Computer Science Roadshows (2003 – 2012, http://women.cs.cmu.edu)
Visit middle and high schools promoting computer science as a possible major and career

INDEPENDENT OUTREACH

Middle School Science Fair Judging
Interview students about their science fair projects and provide feedback and scoring.

Gizmology (www.gizmologylab.com)
Designed and taught a 10-week program to get elementary-school-aged kids interested in engineering through hands-on activities. The 3-5 projects per session teach engineering, 3D printing, laser cutting, electronics, and some computer science principles through making things. The idea and hope is that kids will take their projects home, play with them, explain them to friends and family, and think about them more later. Bringing home their projects reinforces the STEM ideas over time. To date, I have taught to a combined 120 paying students at Shady Side Academy Junior School, St. Edmunds Academy, and St. Bernard School.

INVITED TALKS

Crash Course in AI for Teachers (June 2022)

AI for Teachers (June 2021)

Traffic21 1-week course on AI and Transportation (May 2021)

Association of Certified Fraud Examiners Pittsburgh Area Meeting (Jan 2021)

Guest Lecture in Human Robot Interaction at the Colorado School of Mines (2020)

Dreaming Big: The Pitfalls and Potential of AI and ML in Big Data Analytics Education at *Third Annual Data Science Educators Workshop* (June 2019)

Business Analytics at *Foundations of Business* at Chatham University (April 2018)

Explainability for *US Department of Defense* (February 2018)

Data Science and Analytics for Sustainability at *Technology and Sustainability* at Chatham University (November 2017)

Data Science and Sustainability at Chatham University's Eden Hall Campus (August 2017)

What is Data Science at *Computing for the Real World* at Chatham University (April 2017)

Podcasts for Software Engineering Institute (*Research project summaries)* (recorded December 2016)
Why did the robot do that?
Software Engineering Best Practices for Additive Manufacturing

Webinar for Software Engineering Institute (*Humans and Machines Working Together*) (November 2016)

Robotics Institute Faculty Lunch (November 2016)

Software Engineering Institute Research Review (*Research project summaries)* (October 2016)
Why did the robot do that?
Data Validation for Large-Scale Analytics
Software Engineering Best Practices for Additive Manufacturing

Software Engineering Institute Research Lunch (*Why did the robot do that?*) (May 2016)

Software Engineering Institute Internal Review (featured project: *Why did the robot do that?*) (April 2016)

DIA Visit to Carnegie Mellon (*Why did the robot do that?*) (April 2016)

CERDEC Visit to Carnegie Mellon (*Why did the robot do that?*) (April 2016)

Chief of Naval Operations SSG on Robotics (*Human-Centered Planning*) (February 2016)

Assistant Secretary of Defense for Research and Engineering Visit to CMU (*invited participant*, February 2016)

Prof. David Garlan's ABLE Group (*Human-Centered Planning*) (January 2016)

DARPA ISAT Invited Speaker for Centaurs: Human-Computer Teams that Win (*Human-Centered Planning*) (November 2015)

Honeywell Corporation (*Human-Centered Planning*) (April 2015)

Webinar for Cyber-Intelligence Research Consortium (*Predictive Analytics*) (January 2015)

National Security Agency (*Class lectures and practicum on Predictive Analytics*) (November 2014)

University of Pittsburgh Computer Science Department (*Human-Centered Planning*) (April 2014)

National Security Agency (*Summary of Predictive Analytics*) (November 2013)