

HENNY ADMONI

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RESEARCH OVERVIEW

I build **intelligent robots that detect, interpret, and respond to human needs** expressed through verbal and nonverbal behaviors. My robots provide **social and physical assistance** in complex activities like learning new information or preparing a meal. My research draws from the areas of robotics, artificial intelligence, machine learning, computer vision, and cognitive science.

Key words: Assistive robotics, human-robot interaction, collaborative manipulation, intent recognition, nonverbal behavior, developmental robotics, cognitive modeling, cognitive psychology

EDUCATION

Ph.D. Computer Science 2016	Yale University Thesis: <i>Nonverbal Communication in Socially Assistive Human-Robot Interaction</i> Advisor: Brian Scassellati Area of study: Social Robotics
M.A. Computer Science 2009	Wesleyan University Thesis: <i>Demonstrations of Dynamical Intention for Hybrid Agents</i> Advisor: Eric Aaron Area of study: Intelligent Agents
B.A. Computational Cognitive Science (self-designed) 2008	Wesleyan University Thesis: <i>Decision Making and Learning in Hybrid Dynamical Agents</i> Advisors: Eric Aaron, Andrea Patalano, John Kirn Areas of study: Computer Science, Cognitive Psychology, Neuroscience

EMPLOYMENT

Assistant Professor 2017–present	Robotics Institute, Carnegie Mellon University
Postdoctoral Fellow 2015–2017	Robotics Institute, Carnegie Mellon University Personal Robotics Lab (PI: Siddhartha S. Srinivasa)
Research Assistant 2009–2015	Department of Computer Science, Yale University Social Robotics Lab (PI: Brian Scassellati)

AWARDS AND HONORS

Google Anita Borg Memorial Scholarship Highly competitive \$10,000 scholarship for Computer Science women	2014
Palantir Scholarship for Women in Technology Highly competitive scholarship for Computer Science women, \$2,500	2014

National Science Foundation Graduate Research Fellowship	2009–2012
Department of Homeland Security Graduate Fellowship (declined)	2009
Wesleyan University Hughes Research Fellowship Provided funding for academic year and summer research (awarded multiple times)	2007–2008
Department of Homeland Security ISEF Scholar \$20,000 scholarship awarded at the Intel International Science and Engineering Fair	2004–2008

PUBLICATIONS

Peer-Reviewed Journal Articles

- J6** Javdani, S., **Admoni, H.**, Pellegrinelli, S., Srinivasa, S. S., and Bagnell, J. A. (under review). Shared autonomy via hindsight optimization for teleoperation and collaboration. *The International Journal of Robotics Research*. Preprint available at arXiv:1706.00155
Impact factor: 5.3
- J5** Scalise, R., Li, S., **Admoni, H.**, Rosenthal, S., and Srinivasa, S. S. (under review). Natural language instructions for human-robot collaborative manipulation. *The International Journal of Robotics Research*. Preprint available at: https://personalrobotics.github.io/collaborative_manipulation_corpus
Impact factor: 5.3
- J4** **Admoni, H.** and Scassellati, B. (2017). Social eye gaze in human-robot interaction: A review. *Journal of Human-Robot Interaction*, 6(1):25–63
- J3** Castro-González, A., **Admoni, H.**, and Scassellati, B. (2016). Effects of form and motion on judgments of social robots’ animacy, likability, trustworthiness and unpleasantness. *International Journal of Social Robotics*, 90:27–38
Impact factor: 1.41
- J2** Scassellati, B., **Admoni, H.**, and Matarić, M. (2012). Robots for use in autism research. *Annual Review of Biomedical Engineering*, 14:275–294
Impact factor: 10.95
Cited 421 times (as of 1/2018)
- J1** Aaron, E. and **Admoni, H.** (2010). Action selection and task sequence learning for hybrid dynamical cognitive agents. *Robotics and Autonomous Systems*, 58(9):1049–1056
Impact factor: 1.16

Peer-Reviewed Conference Papers

- C17** Aronson, R. M., Santini, T., Kubler, T. C., Kasneci, E., Srinivasa, S. S., and **Admoni, H.** (2018). Eye-hand behavior in human-robot shared manipulation. In *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*
Acceptance rate: 23%
- C16** Li, S., Scalise, R., **Admoni, H.**, Srinivasa, S. S., and Rosenthal, S. (2017). Evaluating critical points in trajectories. In *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 1357–1364
- C15** Pellegrinelli, S., **Admoni, H.**, Javdani, S., and Srinivasa, S. S. (2016). Human-robot shared workspace collaboration via hindsight optimization. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 831–838
Acceptance rate: 48%

- C14** Li, S., Scalise, R., **Admoni, H.**, Srinivasa, S. S., and Rosenthal, S. (2016). Spatial references and perspective in natural language instructions for collaborative manipulation. In *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 44–51
Acceptance rate: 47%
- C13** Suman, A., Marvin, R., Grigore, E. C., **Admoni, H.**, and Scassellati, B. (2016). Robots can induce mimicry in humans depending on previous behavior. In *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*
Acceptance rate: 47%
- C12** **Admoni, H.**, Weng, T., and Scassellati, B. (2016). Modeling communicative behaviors for object references in human-robot interaction. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 3352–3359
Acceptance rate: 35%
- C11** **Admoni, H.**, Weng, T., Hayes, B., and Scassellati, B. (2016). Robot nonverbal behavior improves task performance in difficult collaborations. In *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 51–58
Acceptance rate: 25%
- C10** **Admoni, H.** and Scassellati, B. (2014). Data-driven model of nonverbal behavior for socially assistive human-robot interactions. In *ACM International Conference on Multimodal Interaction (ICMI)*, pages 196–199
Acceptance rate: 39%
- C9** **Admoni, H.**, Datsikas, C., and Scassellati, B. (2014). Speech and gaze conflicts in collaborative human-robot interactions. In *Annual Conference of the Cognitive Science Society (CogSci)*, pages 104–109
Acceptance rate: 41%
- C8** Nawroj, A., Toneva, M., **Admoni, H.**, and Scassellati, B. (2014). An exploration of social grouping in robots: Effects of behavioral mimicry, appearance, and eye gaze. In *Annual Conference of the Cognitive Science Society (CogSci)*, pages 1060–1065
Acceptance rate: 41%
- C7** **Admoni, H.**, Dragan, A., Srinivasa, S. S., and Scassellati, B. (2014). Deliberate delays during robot-to-human handovers improve compliance with gaze communication. In *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 49–56
Acceptance rate: 24%
- C6** **Admoni, H.**, Hayes, B., Feil-Seifer, D., Ullman, D., and Scassellati, B. (2013). Are you looking at me? Perception of robot attention is mediated by gaze type and group size. In *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 389–396
Acceptance rate: 25%
- C5** **Admoni, H.**, Hayes, B., Feil-Seifer, D., Ullman, D., and Scassellati, B. (2013). Dancing with myself: The effect of majority group size on perceptions of majority and minority robot group members. In Knauff, M., Pauen, M., Sebanz, N., and Wachsmuth, I., editors, *Annual Conference of the Cognitive Science Society (CogSci)*, pages 1708–1713
- C4** **Admoni, H.** and Scassellati, B. (2012). A multi-category theory of intention. In Miyake, N., Peebles, D., and Cooper, R. P., editors, *Annual Conference of the Cognitive Science Society (CogSci)*, pages 1266–1271
- C3** **Admoni, H.**, Bank, C., Tan, J., and Toneva, M. (2011). Robot gaze does not reflexively cue human attention. In Carlson, L., Hölscher, C., and Shipley, T., editors, *Annual Conference of the Cognitive Science Society (CogSci)*, pages 1983–1988

- C2** Aaron, E., Mendoza, J.-P., and **Admoni, H.** (2011). Integrated dynamical intelligence for interactive embodied agents. In *Proceedings of the International Conference on Agents and Artificial Intelligence (ICAART)*
Acceptance rate: 27%
- C1** Aaron, E. and **Admoni, H.** (2009). A framework for dynamical intention in hybrid navigating agents. In *Proceedings of the International Conference on Hybrid Artificial Intelligence Systems (HAIS)*, volume LNCS 5572, pages 218–225
Acceptance rate: 41%

Peer-Reviewed Workshop Papers

- W8** **Admoni, H.** and Srinivasa, S. S. (2016). Predicting user intent through eye gaze for shared autonomy. In *Proceedings of the AAAI Fall Symposium: Shared Autonomy in Research and Practice*, pages 298–303. AAAI Press
- W7** Holladay, R., Herlant, L., **Admoni, H.**, and Srinivasa, S. S. (2016). Visibility optimization in manipulation tasks for a wheelchair-mounted robot arm. In *RO-MAN Workshop on Human-Oriented Approaches for Assistive and Rehabilitation Robotics (HUMORARR)*
- W6** **Admoni, H.** and Scassellati, B. (2015). Eye gaze in collaborative human-robot interaction. In *Proceedings of the Human Robot Teaming Workshop at HRI*
- W5** **Admoni, H.** and Scassellati, B. (2014). Nonverbal behavior modeling for socially assistive robots. In *Proceedings of the AAAI Fall Symposium: Artificial Intelligence and Human-Robot Interaction (AI-HRI)*. AAAI Press
- W4** **Admoni, H.** and Scassellati, B. (2014). The role of robots in socially assistive applications. In *Proceedings of the Rehabilitation and Assistive Robotics Workshop at IROS*
- W3** **Admoni, H.** and Scassellati, B. (2014). Demo: Toward a data-driven generative behavior model for human-robot interaction. In *Proceedings of the Workshop on Mobile Augmented Reality and Robotic Technology-Based Systems (MARS) at MobiSys*, pages 19–20
- W2** **Admoni, H.** and Scassellati, B. (2012). Robot gaze is different from human gaze: Evidence that robot gaze does not cue reflexive attention. In *Proceedings of the “Gaze in Human-Robot Interaction” Workshop at HRI*
- W1** Aaron, E. and **Admoni, H.** (2009). Approaches to learning for hybrid dynamical cognitive agents. In *Proceedings of the International Workshop on Hybrid Control of Autonomous Systems (HYCAS)*, pages 83–90

Theses

- T3** Admoni H. 2016. Nonverbal Communication in Socially Assistive Human-Robot Interaction. PhD thesis, Yale University.
- T2** Admoni H. 2009. Demonstrations of Dynamical Intention for Hybrid Agents. Master’s thesis, Wesleyan University.
- T1** Admoni H. 2008. Decision Making and Learning in Hybrid Dynamical Agents. Undergraduate Honors thesis, Wesleyan University.

TEACHING

16-467: Human-Robot Interaction (undergraduate) Carnegie Mellon University	2018
16-867: Human-Robot Interaction (graduate) Carnegie Mellon University	2017
16-843: Manipulation Algorithms (graduate) Carnegie Mellon University <i>co-taught with Dr. Katharina Muelling</i>	2016

INVITED TALKS

Carnegie Mellon University, Girls of Steel FIRST Robotics Club	Dec 2017
CMUThink LA: Creating the Future, Beverly Hills, CA	Oct 2017
University of Southern California, Computer Science Colloquium	Oct 2017
Carnegie Mellon University, Robotics Institute Seminar	Sept 2017
RSS Women in Robotics Workshop	July 2017
Carnegie Mellon University, RSS Area Chair Symposium	April 2017
Cornell University	April 2017
Technion–Israel Institute of Technology	Mar 2017
Bar Ilan University (Israel)	Mar 2017
Tel Aviv University (Israel)	Mar 2017
Hebrew University (Israel)	Mar 2017
Cornell Tech (NYC)	Mar 2017
Carnegie Mellon University	Mar 2017
Georgia Institute of Technology	Feb 2017
Technical University Munich, HRI PC Meeting Research Symposium	Nov 2016
Carnegie Mellon University, Capacity Building for Accessibility Workshop	Nov 2016
Rensselaer Polytechnic Institute (RPI), EECS Colloquium	Oct 2016
RSS Workshop on Human-Robot Interaction	June 2016
University of Washington, Robotics Colloquium	April 2016
Food and Drug Administration, Research Meeting	April 2016
Cornell University, Robotics Seminar	April 2015
IROS Rehabilitation and Assistive Robotics Workshop	Sept 2014
MobiSys Mobile Augmented Reality and Robotic Technology Systems Workshop	June 2014
Wesleyan University, Computer Science Departmental Colloquium	Feb 2014
Yale University, Davenport College Graduate Research Forum	Oct 2013

MENTORING

Co-authored publication numbers refer to the publication lists above.

Current PhD students

Reuben Aronson, <i>Assistive Robot Manipulation</i> <i>Publications: C17</i>	2017–
Benjamin Newman, <i>Learning Multimodal Policies for Human-Robot Interaction</i> (co-advised with Kris Kitani)	2017–
Stephanie Valencia-Valencia, <i>Assistive Communication Interfaces</i> (co-advised with Jeffrey Bigham)	2017–

Current MS students

Abhijat Biswas, *Computer Vision for Social Navigation*
(co-advised with Aaron Steinfeld) 2017–

Current MRSD student teams

I-Chen Jwo, Ting-Che Lin, Jiahong Ouyang, Karsh Tharyani, Yang Yang
Assistive Intent Recognition and Manipulation 2017–

Past undergraduate researchers

Yu Xiang (Billy) Zhu, CMU 2017

Rachel Holladay, CMU 2015–2016
Publications: W7

Wei Parker Gu, CMU 2016

Thomas Weng, Yale 2015
Yale Computer Science Department Research Award, 2015
Publications: C11, C12

Rebecca Marvin, Yale 2014–2015
Publications: C13

Apurv Suman, Yale 2014–2015
Publications: C13

Natalie Warren, Yale 2014–2015

Christopher Datsikas, Yale 2013–2015
Publications: C9

Daniel Ullman, Yale 2012–2014
Publications: C6, C5

Mariya Toneva, Yale 2011
Publications: C3

Caroline Bank, Yale 2011
Publications: C3

Joshua Tan, Yale 2011
Publications: C3

Past Non-Faculty Advising

Shervin Javdani, CMU PhD 2015–2017
Publications: C15, J6

Laura Herlant, CMU PhD <i>Publications: W7</i>	2015–2017
Stefanos Nikolaidis, CMU PhD	2015–2017
Rosario Scalise, CMU MS <i>Publications: C14, C16, J5</i>	2015–2017
Shen Li, CMU MS <i>Publications: C14, C16, J5</i>	2015–2017

SERVICE

Organizing Committee

Robotics: Science and Systems (RSS) 2018 RSS Pioneers Co-Chair	2017–2018
International Conference on Robotics and Automation (ICRA) 2018 Career Fair Co-Chair	2017–2018
International Conference on Human-Robot Interaction (HRI) 2018 Student Volunteers Co-Chair	2017–2018
Mathematical Models, Algorithms, and Human-Robot Interaction Workshop at RSS 2017 Co-Organizer	2016–2017
International Journal of Robotics Research (IJRR), Special Issue on HRI Co-Editor	2016
Human Robot Interaction Workshop at RSS 2016 Co-Organizer	2015–2016
HRI Pioneers Workshop at HRI 2013 Program Committee Chair	2012–2013

Program Committee

ACM/IEEE International Conference on Human-Robot Interaction (HRI)	2017, 2018
Pioneers Workshop at HRI	2017, 2018
International Conference on Autonomous Agents and Multiagent Systems (AAMAS)	2018
International Joint Congress on Artificial Intelligence (IJCAI)	2016, 2017
IEEE Symposium on Robot and Human Interactive Communication (RO-MAN)	2016
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2016
AAAI Conference on Artificial Intelligence (AAAI)	2016
IEEE Workshop on Advanced Robotics and its Social Impacts (ARSO)	2014
Workshop for Mobile Assistive and Robotic Technology-Based Systems (MARS) at Mobisys	2014
Human Robot Collaboration Workshop at RSS 2013	2013

Refereeing: Grant Agencies

National Science Foundation (NSF)	2016
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Refereeing: Conferences and Journals

IEEE Transactions on Robotics (T-RO)	2018
ACM Transactions on Human-Robot Interaction (THRI)	2018
ACM Conference on Human Factors in Computing Systems (CHI)	2018
Late Breaking Reports at HRI	2014, 17, 18
International Journal of Robotics Research (IJRR)	2017
IEEE Robotics and Automation Letters (RA-L)	2017
IEEE Pervasive Computing	2017
IEEE/RAS International Conference on Humanoid Robots (Humanoids)	2014, 2017
ACM/IEEE International Conference on Human-Robot Interaction (HRI)	2011–2016
IEEE International Conference on Robotics and Automation (ICRA)	2015–2016
Interaction Studies	2013, 2016
ACM Transactions on Interactive Intelligent Systems (TIIS)	2015
International Journal of Social Robotics (IJSR)	2015
Video Session at HRI	2015
IEEE Symposium on Robot and Human Interactive Communication (RO-MAN)	2011, 15, 17
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2012–15, 17
IEEE Transactions on Human-Machine Systems (THMS)	2013–15, 18
Journal of Autism and Developmental Disorders	2014
Journal of Human-Robot Interaction (JHRI)	2013
Autism: The International Journal of Research and Practice	2013
Transactions on Autonomous Mental Development (TAMD)	2013
Gaze and Speech Workshop at HRI	2013
International Joint Congress on Artificial Intelligence (IJCAI)	2011
International Conference on Social Robotics (ICSR)	2011

Other Service

Mentor, Girls of Steel FIRST Robotics Club, CMU	2017–
Graduate Affiliate, Davenport College, Yale University	2013–2015
Mentor, Women in Science at Yale	2012–2015
Judge, New Haven Science Fair	2011–2015

SELECTED OUTREACH

I participate in outreach events at least once a month. This list highlights a selection of representative events.

Girls of Steel , FIRST Robotics Team, CMU Presented a talk and Q&A about my research and career path for about 50 middle and high school girls on the FIRST robotics team at CMU.	2017
Founders Exposition , CMU 50th Anniversary Celebration Conducted an interactive demonstration of our multi-modal assistive robot arm platform to CMU VIPs and the public over a three-day technology fair.	2017
Family Day , DARPA Offices, Washington DC Presented our novel shared autonomy algorithms for assistive care with an interactive robot demo to approximately 700 DARPA affiliates and their guests.	2016
Capacity Building Initiative Workshop: Accessibility at CMU Helped organize a full-day workshop increasing disability awareness and highlighting resources and research for accessibility at CMU, attended by approximately 70 people from around the US.	2016

<p>Yale Social Robotics Lab open houses, Yale University, New Haven CT Robotics demonstrations including Nao, Keepon, and person tracking via Kinect at twice annual lab open houses for the public, which drew about 100 adults and children from the greater New Haven community each.</p>	2012–2015
<p>Yale Celebration of Women in Computing Day, Yale University, New Haven CT Helped organize full day event highlighting women in computing at Yale for about 100 people from Yale and the community. My role included moderating a graduate student panel and organizing faculty speakers.</p>	2014
<p>World Science Festival, NYU Kimmel Center, New York NY Public demonstration of social robots detecting and responding to eye gaze with over 3,000 visitors.</p>	2014
<p>In-school demonstration, Bethany Community School, Bethany CT Visit to the Girls Excelling in Math and Science (GEMS) after-school club including robot demonstration and Q&A for about 30 girls aged 9–12.</p>	2014

SELECTED MEDIA COVERAGE

<p>Technology Has Come A Long Way, But What Does The Future Hold?, CBS Pittsburgh</p>	2017
<p>AI’s rapid advance sparks call for a code for robots, Financial Times</p>	2017
<p>Making Machines Make Sense, Communications of the ACM</p>	2017
<p>Let Robots Teach Our Kids? Here’s Why That Isn’t Such a Bad Idea, NBC News MACH</p>	2017
<p>Meet HERB your robot butler, Cities Rising: Rebuilding America series, Yahoo News with Katie Couric</p>	2016
<p>Ahead of its Time—Research in the US, Deutsche Welle Business Magazine</p>	2016
<p>Four robots at your service, Les Années Lumière show, Radio Canada</p>	2016