

REUBEN M. ARONSON

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RESEARCH OVERVIEW

I build human-robot interaction algorithms for collaborative manipulation to improve assistive technologies. I focus on how to incorporate natural nonverbal behaviors, particularly eye gaze, into these systems.

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

EDUCATION

Ph.D. Robotics Spring 2022 (expected)	Robotics Institute, Carnegie Mellon University Advisor: Henny Admoni Area of study: Human-Robot Interaction
M.S. Robotics 2018	Robotics Institute, Carnegie Mellon University Advisor: Henny Admoni Area of study: Human-Robot Interaction
B.S. Mechanical Engineering 2012	Massachusetts Institute of Technology Thesis: <i>Design of Clamping Mechanism for Securing Sections of Unmanned Submarine</i> Advisor: Douglas Hart

PUBLICATIONS

Peer-Reviewed Journal Articles

- J2** Newman*, B. A. , **Aronson*, R. M.** , Srinivasa, S. S. , Kitani, K. , and Admoni, H. (2021). HARMONIC: A Multimodal Dataset of Assistive Human-Robot Collaboration. *International Journal of Robotics Research*, In press
- J1** Jia, Z. , Bhatia, A. , **Aronson, R. M.** , Bourne, D. , and Mason, M. T. (2018). A survey of automated threaded fastening. In *IEEE Transactions on Automation Science and Engineering*, pages 1–13

Peer-Reviewed Conference Papers

- C6** **Aronson, R. M.** , Almutlak, N. , and Admoni, H. (2021). Inferring Goals with Gaze during Teleoperated Manipulation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
- C5** Luria, M. , Pusateri, J. , Oden Choi, J. , **Aronson, R.** , Yildirim, N. , and Steenson, M. W. (2020). Medieval robots: The role of historical automata in the design of future robots. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference*, DIS’ 20 Companion, page 191–195, New York, NY, USA. Association for Computing Machinery
- C4** **Aronson, R. M.** and Admoni, H. (2019). Semantic gaze labeling for human-robot shared manipulation. In *ACM Symposium on Eye Tracking Research & Applications*

- C3** Cheng, X. , Jia, Z. , Bhatia, A. , **Aronson, R. M.** , and Mason, M. T. (2018). Sensor selection and stage & result classifications for automated miniature screwdriving. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
- C2** **Aronson, R. M.** , Santini, T. , Kübler, 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%
- C1** **Aronson, R. M.** , Bhatia, A. , Jia, Z. , Guillame-Bert, M. , Bourne, D. , Dubrawski, A. , and Mason, M. T. (2016). Data-driven classification of screwdriving operations. In *International Symposium on Experimental Robotics*

Peer-Reviewed Workshop Papers

- W3** **Aronson, R. M.** and Admoni, H. (2020). Eye gaze for assistive manipulation. HRI '20, page 552–554, New York, NY, USA. Association for Computing Machinery
- W2** **Aronson, R. M.** and Admoni, H. (2018). Gaze for error detection during human-robot shared manipulation. In *RSS Workshop: Towards a Framework for Joint Action*
- W1** **Aronson, R. M.** , Bhatia, A. , Jia, Z. , and Mason, M. T. (2017). Data collection for screwdriving. In *RSS Workshop on (Empirically) Data-Driven Manipulation*

Patents

- P1** Ao, X. S. , Doria, S. L. , Xu, J. C. , and **Aronson, R. M.** (2013). Fluid density stratification location system, device and method. *U. S. Patent No. 9,343,055*

WORK EXPERIENCE

Mechanical Engineer, Naval Research Laboratory (Contractor with Exelis, Inc.) Washington, DC	2012–2015
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TEACHING EXPERIENCE

Mechanics of Manipulation (graduate), Teaching Assistant Carnegie Mellon University	2016
Calculus 1 and 2, Differential Equations, Physics 2, Linear Algebra (undergraduate), Teaching Assistant MIT Experimental Studies Group (ESG)	2009–2012

MENTORING

Karen Zhang, CMU Undergrad Research	2019–present
Nadia AlMutlak, RI Summer Scholars Program (<i>Publications: C6</i>)	2019–2020
Krish Vaswani, CMU Summer Undergrad Research Apprenticeship	2019
Maggie Collier, RI Summer Scholars Program <i>Now a PhD Student at Robotics Institute, Carnegie Mellon University</i>	2018

AWARDS

Participant, HRI Pioneers Workshop	2020
Uber Presidential Fellowship	2016–2017
Fiekowsky Excellence in Teaching Award (ESG)	2012
Member, Burchard Scholars (MIT humanities honor society)	2011

SERVICE

Reviewer for AURO 2018, HRI 2018-2022, HUMANOIDS 2016-2017, 2019, IEEE VR 2019, IROS 2018, RA-L 2021, RO-MAN 2021, RSS 2019, THRI 2020-2021, UIST 2019

Co-founder and organizer of the CMU HRI Reading Group

<http://harp.ri.cmu.edu/reading-group/>

Organize weekly presentations, regularly present papers and facilitate discussions

2018–present

Ph. D. qualifier committee member for Eric Huang, Ankit Bhatia

Founding member of the **SCS4All PhD Initiative**, which advocates for and supports PhD students at the CMU School of Computer Science

2017–2019

Founding member of **CMU Tech4Society** (<https://tech4society.group>), which provides technical support to local nonprofit and activist groups in the Pittsburgh area

2016–2019