

# Katherine (Kat) Allen

## Human-Robot Interaction and Mechanical Controls PhD Candidate

### PERSONAL INFORMATION:

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**Location:** Greater Boston, MA    **Email:** [katallen@gmail.com](mailto:katallen@gmail.com)  
**Phone:** (617) 388-1504    **Website:** <http://www.katallen.org>

### EDUCATION:

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**Tufts University** – Medford, MA

Expected May 2027—PhD in Human-Robot Interaction and Mechanical Engineering

May 2024—MS in Human-Robot Interaction and Mechanical Engineering

**Massachusetts Institute of Technology** – Cambridge, MA

June 2005—Bachelor of Science in Aerospace Engineering with Information Technology (XVI-2)

### RESEARCH AND PROFESSIONAL EXPERIENCE:

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**THE ASSISTIVE AGENT BEHAVIOR AND LEARNING LAB (ADVISOR: ELAINE SHORT) &**

**THE CENTER FOR ENGINEERING, EDUCATION, AND OUTREACH: FUTURE EDUCATION TECHNOLOGIES LAB (ADVISOR: CHRIS ROGERS)**

**TUFTS UNIVERSITY, MEDFORD, MA**

2022-ONGOING. ROS, CONTROL SYSTEMS, HUMAN SUBJECT STUDIES, HUMAN-ROBOT COLLABORATION, KINEMATICS, DIY ASSISTIVE TECHNOLOGY, MAKERSPACES, HACKATHONS, ENGINEERING EDUCATION, USER-CENTERED DESIGN  
Ongoing research into accessible informal engineering education, including DIY assistive technology.  
Ongoing research into human-robot haptic collaboration to make robotic assistance more helpful and intuitive.

**RAYTHEON TECHNOLOGIES, SUDBURY, MA**

JUNE 2005-AUGUST 2011. MECHANICAL DESIGN, CAD: PRO/ENGINEER, MILSPEC REQUIREMENTS, RISK MITIGATION, SHOCK AND VIBRATION ANALYSIS, DESIGN FOR MANUFACTURING, DESIGN FOR MAINTENANCE, SUBCONTRACTOR MANAGEMENT, FIELD REPAIR, HVAC, PSYCHROMETRY, COTS INTEGRATION

***AN/TPY-2 Thermal Management System Redesign:*** Led a team in failure diagnosis and field repair of multiple deployed MILSPEC thermal management units for hardware and operator enclosures. Led the subsequent redesign of specifications for a replacement system.

***DDG-1000 Zumwalt Electronic Modular Enclosure:*** Led a small team in integrating COTS electronics into the Zumwalt Destroyer, which launched in 2016. Designed and executed a novel risk mitigation and testing plan to certify COTS equipment for a military shock and vibration environment.

**AEROSPACE CONTROLS LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA**

2001 AUTONOMOUS VEHICLES, SYSTEMS AND CONTROL DESIGN, METALWORKING, ELECTRONICS

Designed and assembled a laboratory clean room space for working with autonomous spacecraft, assisted in manufacturing and testing of coordinated multi-agent, single-controller ground and UAV systems.

## PUBLICATIONS (FULL PAPERS):

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**Katherine H. Allen**, Reuben M Aronson, Tapomayukh Bhattacharjee, Frank Broz, Mai Lee Chang, Maggie Collier, Taylor Kessler Faulkner, Hee Rin Lee, Isabel Neto, Katie Winkle, Elaine Schaertl Short. 2024. Assistive Applications, Accessibility, and Disability Ethics in HRI. In Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (HRI '24). Association for Computing Machinery, New York, NY, USA, 1305–1307. <https://doi.org/10.1145/3610978.3638151>

**Katherine H. Allen**, Audrey K. Balaska, Reuben M. Aronson, Chris Rogers, and Elaine Schaertl Short. 2023. Barriers and Benefits: The Path to Accessible Makerspaces. In Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '23). Association for Computing Machinery, New York, NY, USA, Article 7, 1–14. <https://doi.org/10.1145/3597638.3608414>

Hang Yu, **Katherine H. Allen**, Reuben Aronson, Elaine Schaertl Short. (in press). “From “Thumbs Up” to “10 out of 10”: Reconsidering Scalar Feedback in Interactive Reinforcement Learning. 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems.

Shuonan Dong, **Katherine Allen**, et al. "Self-assembling Wireless Autonomous Reconfigurable Modules," AIAA 2005-B5.6.B.04. 56th International Astronautical Congress of the International Astronautical Federation, the International Academy of Astronautics, and the International Institute of Space Law. October 2005.

## LEADERSHIP, MENTORING, AND OUTREACH:

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### **TUFTS UNIVERSITY - AABL AND CEEO LABS**

Mentored ten undergraduate students across several projects, including creating a digital/hybrid makerspace and making a UR3 robotic arm accessible to novice users without needing to install ROS by making ROS control available via a JupyterHub server.

### **STEM OUTREACH - GIRL SCOUTS OF SOMERVILLE TROOP 82122 - 2017-PRESENT**

Ongoing outreach and education programs for a variety of STEM, financial literacy, and outdoors topics

### **GIRL SCOUTS OF SOMERVILLE AND CAMBRIDGE SERVICE UNIT TREASURER 2020-PRESENT**

Treasurer for the Somerville Service Unit providing support to troop leaders in an underserved area. In 2021, arranged to add the adjacent Girl Scouts of Cambridge (who had no Service Unit level leadership) to our Service Unit.

### **MASTER EDUCATOR AND BOARD OF DIRECTORS, BAY STATE BABYWEARERS — 2011-2023**

Led a non-profit which empowers families and caregivers through babywearing. Oversaw the transition of the organization from a local chapter to an independent 501c3 serving Massachusetts and southern New Hampshire. Pivoted the organization to an entirely online/remote model during the CoViD-19 pandemic, and then to a hybrid organization providing technical help via email, Facebook, and at in-person meetups.

### **BOARD OF DIRECTORS, SECRETARY AND TECHNOLOGY TEAM, BABYWEARING INTERNATIONAL — 2014-2017**

Served as a director in several roles for a rapidly-growing organization with 110 chapters across the US. Served on the hiring committee the organization's first paid staff member. Developed communication plans for policy and social media responses for urgent organizational issues. Served as an Educator Evaluator providing training and evaluation to certify volunteer educators serving in local communities.