Daniel J. Szafir Curriculum Vitae

ASSISTANT PROFESSOR · UNIVERSITY OF COLORADO BOULDER

ATLAS Institute & Department of Computer Science, 1111 Engineering Drive, Boulder, CO 80309

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Research Interests

Mission   My goal is to advance knowledge regarding the design of new sensing, interface, and robotic technologies to improve user experience, productivity, and enjoyment

Interests   Human-robot interaction (HRI); human-computer interaction (HCI); virtual, augmented, and mixed reality (VR/AR/MR); user-centered design; human-centered computing (HCC); aerial robotics; robotic technologies for space exploration; human-robot coordination and collaboration; educational technologies; robotic technologies for manufacturing

Employment

Assistant Professor
2015 – Present

UNIVERSITY OF COLORADO BOULDER   *Boulder, Colorado*

Department of Computer Science & ATLAS Institute

Affiliate Appointments: Department of Aerospace Engineering; Department of Information Science; Institute of Cognitive Science; Research and Engineering Center for Unmanned Vehicles (RECUV); Center for Neuroscience; Culture, Language, and Social Practice (CLASP) Program

Research Intern
Summer 2013 & Spring 2015

INTELLIGENT ROBOTICS GROUP, NASA AMES RESEARCH CENTER   *Mountain View, California*

Graduate Research Fellow
2010 – 2015

DEPARTMENT OF COMPUTER SCIENCES, UNIVERSITY OF WISCONSIN–MADISON   *Madison, WI*

Software Development Intern
Summer 2007 & Summer 2009

INTERNATIONAL BUSINESS MACHINES (IBM), INC.   *Essex Junction, Vermont*

Software Development Intern
Summer 2008

TYBRIN CORPORATION   *Nashua, New Hampshire*

Education

Ph.D., Computer Science
2012 – 2015

UNIVERSITY OF WISCONSIN–MADISON   *Madison, Wisconsin*

Dissertation: "Human Interaction with Assistive Free-Flying Robots"
Committee: Bilge Mutlu (co-chair), Terrence Fong (co-chair), John Lee, Kevin Ponto, and Tom Ristenpart
NASA Space Technology Research Fellow

Master of Science, Computer Science
2010 – 2012

UNIVERSITY OF WISCONSIN–MADISON   *Madison, Wisconsin*

Bachelor of Arts, Computer Science
2006 – 2010

BOSTON COLLEGE   *Chestnut Hill, Massachusetts*

Honor's Thesis: "Non-Invasive BCI through EEG: An Exploration of the Utilization of Electroencephalography to Create Thought-Based Brain-Computer Interfaces"

Bachelor of Arts, History
2006 – 2010

BOSTON COLLEGE   *Chestnut Hill, Massachusetts*

Honors & Awards

2019	**Best Paper Award** (Top 1 in Virtual, Augmented, and Mixed Reality) International Conference on Human-Computer Interaction (HCII 2019) Szafir: *Mediating Human-Robot Interactions with Virtual, Augmented, and Mixed Reality*
2018	**Best Paper Award** (Top 4 of 217) ACM/IEEE Human-Robot Interaction (HRI 2018) Walker, Hedayati, Lee, & Szafir: *Communicating Robot Intent with Augmented Reality*
2018	**Best Paper Award Nominee** (Top 10 of 217) ACM/IEEE Human-Robot Interaction (HRI 2018) Hedayati, Walker, & Szafir: *Improving Collocated Robot Teleoperation with Augmented Reality*
2017	**Forbes 30 Under 30: Science** Named to the Forbes 30 Under 30 list of top innovators
2016	**NASA Early Career Faculty Award**
2015	**NSF CISE Research Initiation Initiative (CRII) Award**
2014	**Doctoral Consortia** ACM/IEEE International Conference on Human-Robot Interaction (HRI 2014) ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2014)
2012 – 2015	**NASA Space Technology Research Fellow (NSTRF)**
2011	**Honored Instructor Award** Awarded to recognize outstanding classroom instructors across UW-Madison
2011	**Outstanding Graduate Student Instructor Award** Awarded to exceptional graduate student instructors within the CS department at UW-Madison
2010	**Boston College Computer Science Accenture Award** Awarded to the top graduating student in Computer Science for outstanding performance
2010	**Order of the Cross and Crown** Boston College Honor Society for demonstrating excellence in academics, service, and leadership
2010	**Phi Beta Kappa**
2010	**Graduated Summa Cum Laude** Boston College

Publications

Major publications are listed below, with journal articles denoted by "J," conference papers with "C," short papers by "S," workshop papers with "W," demonstrations by "D," theses with "T," technical and other reports by "R," and patents with "P." For each publication, students under my supervision are denoted by [S], collaborators are indicated with [C], thesis advisors by [A], and students under the supervision of others with [O]. Impact factors for journals and acceptance rates for conferences are provided where data is available. Note that conferences represent a primary publication venue in Computer Science.

Journal Articles

J.4. Steve McGuire[O], P. Michael Furlong[C], Terrence Fong[C], Christoffer Heckman[C], **Daniel Szafir**, Simon Julier[C], and Nisar Ahmed[C]. (2019). Everybody Needs Somebody Sometimes: Validation of Adaptive Recovery in Robotic Space Operations. *IEEE Robotics and Automation Letters* (RA-L), 4(2), 1216–1223. doi: https://doi.org/10.1109/LRA.2019.2894381.   *Impact Factor: 3.6*

J.3. **Daniel Szafir**. (2019). Mediating Human-Robot Interactions with Virtual, Augmented, and Mixed Reality. In: Chen J., Fragomeni G. (eds) Virtual, Augmented and Mixed Reality. Applications and Case Studies. Presented at the International Conference on Human-Computer Interaction (HCII 2019). *Lecture Notes in Computer Science*, Volume 11575, pp. 124–149. doi: https://doi.org/10.1007/978-3-030-21565-1_9.   *Impact Factor: 1.2*
Best Paper Award (Top 1 in Virtual, Augmented, and Mixed Reality)

J.2. Steve McGuire[O], P. Michael Furlong[C], Christoffer Heckman[C], Simon Julier[C], **Daniel Szafir**, and Nisar Ahmed[C]. (2018). Failure is Not an Option: Policy Learning for Adaptive Recovery in Space Operations. *IEEE Robotics and Automation Letters* (RA-L), 3(3), 1639–1646. doi: 10.1109/LRA.2018.2801468

Impact Factor: 3.6

J.1. **Daniel Szafir**, Bilge Mutlu[A], and Terrence Fong[C]. (2017). Designing Planning and Control Interfaces to Support User Collaboration with Flying Robots. *International Journal of Robotics Research* (IJRR), 36(5–7), 514–542. doi: 10.1177/0278364916688256

Impact Factor: 4.7

REFEREED FULL CONFERENCE PAPERS

C.24. **Daniel Szafir** and Danielle Albers Szafir[C]. (2021). Connecting Human-Robot Interaction and Data Visualization. To Appear in the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2021)*. Boulder, Colorado.

Acceptance Rate: 23%

C.23. Connor Brooks[S] and **Daniel Szafir**. (2020). Visualization of Intended Assistance for Acceptance of Shared Control. In the *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020)*. Las Vegas, Nevada.

Acceptance Rate: 47%

C.22. Hooman Hedayati[S], Ryo Suzuki[O], Daniel Leithinger[C], and **Daniel Szafir**. (2020). PufferBot: Actuated Expandable Structures for Aerial Robots. In the *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020)*. Las Vegas, Nevada.

Acceptance Rate: 47%

C.21. Hooman Hedayati[S], Annika Muehlbradt[O], **Daniel Szafir**, and Sean Andrist[C]. (2020). REFORM: Recognizing F-formations for Social Robots. In the *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020)*. Las Vegas, Nevada.

Acceptance Rate: 47%

C.20. Ryo Suzuki[O], Hooman Hedayati[S], Clement Zheng[O], James Bohn[O], **Daniel Szafir**, Ellen Do[C], Mark Gross[C], and Daniel Leithinger[C]. (2020). RoomShift: Room-scale Dynamic Haptics for VR with Furniture-moving Swarm Robots. In the *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2020)*, pp. 1–11. Honolulu, Hawaii. doi: https://dl.acm.org/doi/10.1145/3313831.3376523

Acceptance Rate: 24%

C.19. Jamie Voros[O], Jamison McGinley[O], Steven McGuire[O], Michael Walker[S], Priyanka Karki[S], Nisar Ahmed[C], **Daniel Szafir**, and Torin Clark[C]. (2020). Trust in an Autonomous Guidance System for a Planetary Rover Task. In the *IEEE Aerospace Conference (AeroConf 2020)*, pp. 1–8. Big Sky, Montana. doi: https://doi.org/10.1109/AERO47225.2020.9172290

C.18. Darren Guinness[O], Annika Muehlbradt[O], **Daniel Szafir**, and Shaun Kane[C]. (2019). RoboGraphics: Dynamic Tactile Graphics Powered by Mobile Robots. In the *Proceedings of the International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2019)*, pp. 318–328. Pittsburgh, Pennsylvania. doi: 10.1145/3308561.3353804

Acceptance Rate: 26%

C.17. Michael Walker[S], **Daniel Szafir**, and Irene Rae[C]. (2019). The Influence of Size in Augmented Reality Telepresence Avatars. In the *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces (VR 2019)*, pp. 538–546. Osaka, Japan. doi: 10.1109/VR.2019.8798152

Acceptance Rate: 22%

C.16. Michael Walker[S], Hooman Hedayati[S], and **Daniel Szafir**. (2019). Augmented Reality Teleoperation using Virtual Surrogate Robots. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019)*, pp. 202–210. Daegu, South Korea. doi: 10.1109/HRI.2019.8673306

Acceptance Rate: 24%

C.15. Connor Brooks[S] and **Daniel Szafir**. (2019). Balanced Information Gathering and Goal-Oriented Actions in Shared Autonomy. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019)*, pp. 85–94. Daegu, South Korea. doi: 10.1109/HRI.2019.8673192

Acceptance Rate: 24%

C.14. Darren Guinness[O], **Daniel Szafir**, and Shaun Kane[C]. (2018). The Haptic Video Player: Using Mobile Robots to Create Tangible Video Annotations. In the *Proceedings of the ACM International Conference on Interactive Surfaces and Spaces (ISS 2018)*, pp. 203–211. Tokyo, Japan. doi: 10.1145/3279778.3279805

Acceptance Rate: 27%

C.13. Daniel Prendergast[S], and **Daniel Szafir**. (2018). Improving Object Disambiguation from Natural Language using Empirical Models. In the *Proceedings of the ACM International Conference on Multimodal Interaction (ICMI 2018)*, pp. 477–485. Boulder, Colorado. doi: 10.1145/3242969.3243025

Acceptance Rate: 31%

C.12. Michael Walker[S], Hooman Hedayati[S], Jennifer Lee[O], and **Daniel Szafir**. (2018). Communicating Robot Intent with Augmented Reality. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2018)*, pp. 316–324. Chicago, Illinois. doi: 10.1145/3171221.3171253
Best Paper Award (Top 4 in 217 submissions)

Acceptance Rate: 23%

C.11. Hooman Hedayati[S], Michael Walker[S], and **Daniel Szafir**. (2018). Improving Collocated Robot Teleoperation with Augmented Reality. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2018)*, pp. 78–86. Chicago, Illinois. doi: 10.1145/3171221.3171251
Best Paper Award Nominee (Top 10 in 217 submissions)

Acceptance Rate: 23%

C.10. Connor Brooks[S], Madhur Atreya[S], and **Daniel Szafir**. (2018). Proactive Robot Assistants for Freeform Collaborative Tasks through Multimodal Recognition of Generic Subtasks. In the *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018)*, pp. 8567–8573. Madrid, Spain. doi: 10.1109/IROS.2018.8594180

Acceptance Rate: 47%

C.9. Michael Iuzzolino[S], Michael Walker[S], and **Daniel Szafir**. (2018). Virtual-to-Real-World Transfer Learning for Robots on Wilderness Trails. In the *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018)*, pp. 576–582. Madrid, Spain. doi: 10.1109/IROS.2018.8593883

Acceptance Rate: 47%

C.8. Catherine Diaz[S], Michael Walker[S], Danielle Albers Szafir[C], and **Daniel Szafir**. (2017). Designing for Depth Perceptions in Augmented Reality. In the *Proceedings of the IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2017)*, pp. 111–122. Nantes, France. doi: 10.1109/ISMAR.2017.28

Acceptance Rate: 26%

C.7. Darren Guinness[O], **Daniel Szafir**, and Shaun Kane[C]. (2017). GUI Robots: Using Off-the-Shelf Robots as Tangible Input and Output Devices for Unmodified GUI Applications. In the *Proceedings of the ACM Conference on Designing Interactive Systems (DIS 2017)*, pp. 767–778. Edinburgh, United Kingdom. doi: 10.1145/3064663.3064706

Acceptance Rate: 24%

C.6. **Daniel Szafir**, Bilge Mutlu[A], and Terrence Fong[C]. (2015). Communicating Directionality in Flying Robots. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015)*, pp. 19–26. Portland, Oregon. doi: 10.1145/2696454.2696475

Acceptance Rate: 25%

C.5. Allison Sauppé[C], **Daniel Szafir**, Chien-Ming Huang[C], and Bilge Mutlu[A]. (2015). From 9 to 90: Engaging Learners of All Ages. In the *Proceedings of the ACM Technical Symposium on Computer Science Education (SIGCSE 2015)*, pp. 575–580. Kansas City, Missouri. doi: 10.1145/2676723.2677248

Acceptance Rate: 36%

C.4. **Daniel Szafir**, Bilge Mutlu[A], and Terrence Fong[C]. (2014). Communication of Intent in Assistive Free Flyers. In the *Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2014)*, pp. 358–365. Bielefeld, Germany. doi: 10.1145/2559636.2559672

Acceptance Rate: 24%

C.3. **Daniel Szafir** and Bilge Mutlu[A]. (2013). ARTFul: Adaptive Review Technology for Flipped Learning. In the *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2013)*, pp. 1001–1010. Paris, France. doi: 10.1145/2470654.2466128

Acceptance Rate: 20%

C.2. **Daniel Szafir** and Bilge Mutlu[A]. (2012). Pay Attention! Designing Adaptive Agents that Monitor and Improve User Engagement. In the *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2012)*, pp. 11–20. Austin, Texas. doi: 10.1145/2207676.2207679

Acceptance Rate: 23%

C.1. **Daniel Szafir** and Robert Signorile[A]. (2011). An Exploration of the Utilization of Electroencephalography and Neural Nets to Control Robots. In the *Proceedings of the IFIP TC.13 International Conference on Human-Computer Interaction (INTERACT 2011)*, pp. 186–194. Lisbon, Portugal. doi: 10.5555/2042283.2042303

Acceptance Rate: 22%

Refereed Short Conference Papers and Abstracts

S.7. Hooman Hedayati[S], **Daniel Szafir,** and James Kennedy[C]. (2020). Comparing F-Formations Between Humans and On-Screen Agents. In *Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2020)*, pp. 1–9. Honolulu, Hawaii. doi: 10.1145/3334480.3383015

S.6. Hooman Hedayati[S], Srinjita Bhaduri[O], Tamara Sumner[C], **Daniel Szafir,** and Mark Gross[C]. (2019). HugBot: A Soft Robot Designed to Give Human-like Hugs. In *Works-In-Progress at the ACM International Conference on Interaction Design and Children (IDC 2019)*, pp. 556–561. Boise, ID. doi: 10.1145/3311927.3325332

S.5. Tom Williams[C], **Daniel Szafir,** and Tathagata Chakraborti[C]. (2019). The Reality-Virtuality Interaction Cube: A Framework for Conceptualizing Mixed-Reality Interaction Design Elements for HRI. In *Late-Breaking Reports at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2019)*, pp. 520–521. Daegu, Korea. doi: 10.1109/HRI.2019.8673071

S.4. Hooman Hedayati[S], **Daniel Szafir,** and Sean Andrist[C]. (2019). Recognizing F-Formations in the Open World. In *Late-Breaking Reports at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2019)*, pp. 558–559. Daegu, Korea. doi: 10.1109/HRI.2019.8673233

S.3. **Daniel Szafir**. (2014). Human Interaction with Assistive Free-Flyers. In *Doctoral Consortium Extended Abstracts of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2014)*, pp. 347–350. Toronto, Canada. doi: 10.1145/2559206.2559965   *Acceptance Rate: 25%*

S.2. Kevin Ponto[C], Ross Tredinnick[C], Aaron Bartholomew[C], Carrie Roy[C], **Daniel Szafir,** Daniel Greenheck[C], and Joe Kohlmann[C]. (2013). SculptUp: A Rapid, Immersive 3D Modeling Environment. In the *Proceedings of the IEEE Symposium on 3D User Interfaces (3DUI 2013)*, pp. 199–200. Orlando, Florida. doi: 10.1109/3DUI.2013.6550247   *Acceptance Rate: 27%*

S.1. **Daniel Szafir** and Robert Signorile[A]. (2010). Non-Invasive BCI through EEG. In the *New England Undergraduate Computing Symposium (NEUCS 2010)*, Boston, Massachusetts.

Refereed Workshop & Symposium Papers

W.20. Michael Walker[S], Jack Burns[C], and **Daniel Szafir**. (2020).Mixed Reality Interfaces for the Moon and Beyond: Advancing Surface Telerobotic Interfaces in the NASA Artemis Program. In the *Proceedings of the NASA Exploration Science Forum*, NASA Ames, Mountain View, California.

W.19. Midhun Menon[S], **Daniel Szafir,** and Jack Burns[C]. (2020). Enabling ARTEMIS and the FARSIDE Low Frequency Radio Telescope Missions with URSSA - a Testbed for Extra-Planetary Surface Telerobotics Research. In the *Proceedings of the NASA Exploration Science Forum*, NASA Ames, Mountain View, California.

W.18. Michael Walker[S], Jack Burns[C], and **Daniel Szafir**. (2020). Mixed Reality Interfaces for the Moon and Beyond: Advancing Surface Telerobotic Interfaces in the NASA Artemis Program. In the *Lunar Surface Science Workshop (LSSW 2020)*, Denver, Colorado.

W.17. Midhun Menon[S], Michael Walker[S], Daniel Koris[S], **Daniel Szafir,** and Jack Burns[C]. (2020). Virtual Reality Simulator for Telerobotics Research to Enable Artemis and the FARSIDE Low Frequency Radio Telescope. In the *Lunar Surface Science Workshop (LSSW 2020)*, Denver, Colorado.

W.16. Matthew Whitlock[O], Daniel Leithinger[C], **Daniel Szafir,** and Danielle Albers Szafir[C]. (2020). Toward Effective Multimodal Interaction in Augmented Reality. In the *Workshop on Immersive Analytics held at the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI 2020)*, Honolulu, Hawaii.

W.15. Connor Brooks[S] and **Daniel Szafir**. (2019). Building Second-Order Mental Models for Human-Robot Interaction. In the *AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction (AI-HRI 2019)*, Washington, DC.

W.14. Michael Walker[S], Jack Burns[C], and **Daniel Szafir**. (2019). Virtual Reality Interfaces for Surface Telerobotics from the Lunar Gateway . In the *Proceedings of the NASA Exploration Science Forum*, NASA Ames, Mountain View, California.

W.13. Midhun S. Menon[S], Michael Walker[S], **Daniel Szafir**, Terrence Fong[C], and Jack Burns[C]. (2019). Computationally Efficient Morphological and Photometric Models of the Lunar Terrain. In the *Proceedings of the NASA Exploration Science Forum*, NASA Ames, Mountain View, California.

W.12. Matthew Luebbers[O], Connor Brooks[S], Minjae John Kim,[O], **Daniel Szafir**, and Bradley Hayes[C]. (2019). Augmented Reality Interface for Constrained Learning from Demonstration. In the *Proceedings of the Workshop on Virtual, Augmented and Mixed Reality for Human-Robot Interaction (VAM-HRI) held at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2019)*, Daegu, Korea.

W.11. Hooman Hedayati[S], Akriti Kaput[O], Bradley Hayes[C], and **Daniel Szafir**. (2018). Robot Navigation for Space Station Environments. In the *Proceedings of the Workshop on Autonomous Space Robotics held at the Robotics: Science & Systems Conference (RSS 2018)*, Pittsburgh, Pennsylvania.

W.10. Steve McGuire[O], Michael Walker[S], Jamison McGinley[O], Nisar Ahmed[C], Torin Clark[C], and **Daniel Szafir**. (2018). TRAADRE: TRust in Autonomous ADvisors for Robotic Exploration. In the *Proceedings of the Workshop on Autonomous Space Robotics held at the Robotics: Science & Systems Conference (RSS 2018)*, Pittsburgh, Pennsylvania.

W.9. Connor Brooks[S], Madhur Atreya[S], and **Daniel Szafir**. (2018). Proactive Robot Assistants for Freeform Collaborative Tasks through Multimodal Recognition of Generic Subtasks. In the *Proceedings of the Workshop on Longitudinal Human-Robot Teaming held at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2018)*, Chicago, Illinois.

W.8. Michael Iuzzolino[S], Michael Walker[S], and **Daniel Szafir**. (2018). Virtual-to-Real-World Transfer Learning for Robot Navigation. In the *Proceedings of the Workshop on Virtual, Augmented and Mixed Reality for Human-Robot Interaction held at the IEEE/ACM International Conference on Human-Robot Interaction (HRI 2018)*, Chicago, Illinois.

W.7. Michael Walker[S], Jack Burns[C], and **Daniel Szafir**. (2018). VR Simulation Testbed: Improving Surface Telerobotics for the Deep Space Gateway. In the *Proceedings of the NASA Exploration Science Forum*, NASA Ames, Mountain View, California.

W.6. Michael Walker[S], Jack Burns[C], and **Daniel Szafir**. (2018). VR Simulation Testbed: Improving Surface Telerobotics for the Deep Space Gateway. In the *Proceedings of the Deep Space Gateway Concept Science Science Workshop*, Denver, Colorado.

W.5. **Daniel Szafir**. (2016). A Cognitive Basis for Human Interaction with Aerial Robots. In the *Proceedings of the Workshop on Human-Robot Interaction for Small and Personal Unmanned Aerial Vehicles held at the Robotics: Science and Systems Conference (RSS 2016)*, Ann Arbor, Michigan.

W.4. Steve McGuire[O], P. Michael Furlong[C], Christoffer Heckman[C], Simon Julier[C], **Daniel Szafir**, and Nisar Ahmed[C]. (2016). Teamwork Across the Stars: Machine Learning to Overcome the Brittleness of Autonomy. In the *Proceedings of the Workshop on Human-Robot Collaboration: Towards Co-Adaptive Learning Through Semi-Autonomy and Shared Control held at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)*, Daejeon, Korea.

W.3. Danielle Albers Szafir[C] and **Daniel Szafir**. (2016). Cognitive Load in Visualization: Myths and Misconceptions. In the *Proceedings of the Creation, Curation, Critique and Conditioning of Principles and Guidelines in Visualization (C4PGV 2016) held at IEEE VIS*, Baltimore, Maryland.

W.2. **Daniel Szafir**. (2014). Human Interaction with Assistive Free-Flyers. In the *Proceedings of the Human-Robot Interaction Pioneers Workshop held at the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2014)*, Bielefeld, Germany.

W.1. **Daniel Szafir** and Kevin Ponto[C]. (2012). Panoramic Imagery of Physical Locations Inside Immersive Environments. In the *Proceedings of the Midwest Graphics Conference (Midgraph 2012)*, Chicago, Illinois.

Conference Demonstrations

D.2. Darren Guinness[O], Annika Muehlbradt[O], **Daniel Szafir**, and Shaun Kane[C]. (2019). RoboGraphics: Using Mobile Robots to Create Dynamic Tactile Graphics. In the *International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2019)*, pp. 673–675. Pittsburgh, Pennsylvania.

D.1. Kevin Ponto[C], Ross Tredinnick[C], Aaron Bartholomew[C], Carrie Roy[C], **Daniel Szafir**, Daniel Greenheck[C], and Joe Kohlmann[C]. (2013). SculptUp: A Rapid, Immersive 3D Modeling Environment. In the *IEEE Symposium on 3D User Interfaces (3DUI 2013) Contest*, Orlando, Florida.

Theses

T.2. **Daniel Szafir**. (2015). Human Interaction with Assistive Free-Flying Robots. *Doctoral Dissertation*, University of Wisconsin–Madison, Madison, WI, USA.

T.1. **Daniel Szafir**. (2010). Non-Invasive BCI through EEG: An Exploration of the Utilization of Electroencephalography to Create Thought-Based Brain-Computer Interfaces. *Bachelor Honors Thesis*, Boston College, Chestnut Hill, MA, USA.

Technical / Policy Reports, Editorials, and Other Publications

R.3. **Daniel Szafir**, Krzysztof Skonieczny[C], and Mark Woods[C]. (2020). Editorial: Special Issue on Space Robotics. In the *Journal of Field Robotics (JFR)*, 37(5), pp. 697–698. doi: https://doi.org/10.1002/rob.21954.

R.2. Tom Williams[C], **Daniel Szafir**, Tathagata Chakraborti[C], and Heni Ben Amor[C]. (2018). Report on the 1st International Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI). In *AI Magazine*, 39(4), 64–66. doi: https://doi.org/10.1609/aimag.v39i4.2822.

R.1. Enhanced User Interface Working Group. (2017). Public Safety Enhanced User Interface R&D Roadmap. *National Institute of Standards and Technology's (NIST) Public Safety Communications Research (PSCR) Program*.

Patents

P.2. **Daniel Szafir**, Michael Walker[S], and Hooman Hedayati[S]. (2018). Augmented Reality Coordination of Human-Robot Interaction. U.S. Provisional Patent Pending *PCT/US2019/020831* from Provisional Patent # *US 62/638,578*. Submitted March 5, 2018.

P.1. Bilge Mutlu[A] and **Daniel Szafir**. (2012). Teaching System for Improving Information Retention Based on Brain-State Monitoring. U.S. Patent Application # *US 13/437,699*, Publication # *US 20130260361 A1*.

Research Grants & Gifts

Total Funded: $2,152,707

Federal Grants

National Science Foundation Cyber-Human Systems (NSF IIS: CHS: Medium) Award #1764092 — *Amount: $1,218,056* / *Period: 2018 – 2021*
Data-Mediated Communication with Proximal Robots for Emergency Response
Investigators: Daniel Szafir (PI), Danielle Szafir (Co-I), and Christoffer Heckman (Co-I)

National Aeronautics and Space Administration Early Career Faculty (NASA ECF) Award NNX16AR58G — *Amount: $359,389* / *Period: 2016 – 2020*
Developing Principles for Effective Human Collaboration with Free-Flying Robots
Investigator: Daniel Szafir (PI)

National Science Foundation Research Initiation Initiative (NSF CISE CRII) Award #1566612

LEVERAGING IMPLICIT HUMAN CUES TO DESIGN EFFECTIVE BEHAVIORS FOR COLLABORATIVE ROBOTS
Investigator: Daniel Szafir (PI)

Amount: $174,300
Period: 2016 – 2019

Corporate and Foundation Gifts & Grants

Kairos Ventures Research Award

AUGMENTED REALITY AND AUTONOMOUS SYSTEMS
Investigator: Daniel Szafir (PI)

Amount: $123,379
Period: 2018 – 2019

Ericsson Research Award

3D CAPTURE FOR REMOTE AR COLLABORATION
Investigators: Daniel Leithinger (PI), Ellen Yi-Luen Do (Co-I), Daniel Szafir (Co-I), and Mark Gross (Co-I)

Amount: $57,950
Period: 2018 – 2019

Lockheed Martin Research Award

VIRTUAL REALITY SIMULATION FOR LUNAR SURFACE OPERATIONS
Investigator: Jack Burns (PI) and Daniel Szafir (Co-I)

Amount: $25,858
Period: 2017 – 2018

Intel Research Award #1553595

FUSING ROBOTICS AND CONSUMER DEVICES FOR NEW MULTIMEDIA
Investigator: Daniel Szafir (PI)

Amount: $126,993
Period: 2016 – 2017

University Grants

University of Colorado Boulder Autonomous Systems Interdisciplinary Research Thread Seed Grant

ROBOTIC CHEMISTS: AUTOMATING THE SYNTHESIS OF MULTIFUNCTIONAL MATERIALS
Investigators: Daniel Szafir (PI) and Carson Bruns (Co-I)

Amount: $15,000
Period: 2018

University of Colorado Boulder Multifunctional Materials Interdisciplinary Research Thread Seed Grant

ROBOTIC CHEMISTS: AUTOMATING THE SYNTHESIS OF MULTIFUNCTIONAL MATERIALS
Investigators: Carson Bruns (PI) and Daniel Szafir (Co-I)

Amount: $15,000
Period: 2018

University of Colorado Boulder Autonomous Systems Interdisciplinary Research Thread Seed Grant

AUTONOMOUS VIRTUAL ASSISTANT FOR CREWED SPACE MISSIONS
Investigators: Torin Clark (PI), Nisar Ahmed (Co-I), and Daniel Szafir (Co-I)

Amount: $6,782
Period: 2018

University of Colorado Boulder Innovative Seed Grant Program

FIELDVIEW: USING MOBILE DEVICES TO BLEND DATA COLLECTION AND ANALYSIS FOR FIELD RESEARCH
Investigators: Danielle Szafir (PI) and Daniel Szafir (Co-I)

Amount: $30,000
Period: 2016 – 2017

Fellowships and Awards with UW-Madison Affiliation

National Aeronautics and Space Administration Space Technology Research Fellowship (NSTRF) Award NNX12AN14H

EFFECTIVE HUMAN-ROBOT COLLABORATIVE WORK FOR CRITICAL MISSIONS
Investigator: Bilge Mutlu (PI)
Student Fellow: Daniel Szafir

Amount: $264,000
Period: 2012 – 2015

Selected Press Coverage

2020   **Tech Xplore (US)**
        Research featured in *"PufferBot: A Flying Robot with an Expandable Body"*

2018 **IEEE Spectrum (US)**
Research covered in *"Video Friday"*

2018 **Bloomberg Television (US)**
Research covered in *"Beyond Innovation"*

2018 **IEEE Spectrum (US)**
Quoted and research covered in *"Augmented Reality Makes Robots Better Co-Workers"*

2018 **Motherboard / VICE (US)**
Quoted in *"We Asked 105 Experts What Scares and Inspires Them Most About the Future"*

2018 **NASA Technology Innovation (US)**
Quoted and research covered in *"University Expertise Advancing NASA Robotics"* in Issue 18.1

2018 **CU Boulder Today (US)**
Quoted and research covered in *"A robotic helping hand"*

2017 **Forbes (US)**
Research highlighted as part of inclusion in the *Forbes 30 Under 30* list of top innovators

2017 **CU Engineering Magazine (US)**
Research featured in *"Getting to Know Your Robot"*

2016 **Daily Camera (US)**
Research featured in *"CU Student Meredith Burgess brings Tech to Pole Dance"*

2013 **Wisconsin State Journal (US)**
Research featured in *"Science Festival Mixes Learning, Fun"*

2012 **New Scientist (UK)**
Research featured in *"Mind-reading Robot Teachers Keep Students Focused"*

2012 **Discovery News (US)**
Research featured in *"Mind-reading Robot Teachers Head to Class"*

2012 **Engadget (US)**
Research featured in *"Mind-reading Robotic Teachers Are More... Anyone? Anyone? Attention-grabbing"*

2012 **La Repubblica (Italy)**
Research featured in *"U.S.: Robot Teacher Seeks Out Distracted Students"*

Talks

Invited Talks and Panels

2020   **Colloquium Speaker**
University of Nebraska—Lincoln, Lincoln, Nebraska
"Towards Effective Human-Robot Interaction"

2018   **Panelist**
Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction at HRI 2018, Chicago, Illinois
"Virtual, Augmented and Mixed Reality in Robotics: Progress, Opportunities, Challenges"

2017   **Invited Presentation**
Coalition for National Science Funding (CNSF) Capitol Hill Exhibition, Washington, DC
"Effective Behaviors for Collaborative Robots"

2017   **Panelist**
Computing Research Association New Computing Faculty Workshop, San Diego, California
"Successes and Challenges as a New Assistant Professor"

2017   **Seminar Speaker**
NASA Ames Research Center, Intelligent Robotics Group, Mountain View, California
"Developing Principles for Effective Human Collaboration with Free-Flying Robots"

2017   **Workshop Opening Speaker**
Bridging the Gap in Space Robotics Workshop, RSS Conference, Boston, Massachusetts
"Bridging the Gap in Space Robotics"

2016   **Seminar Speaker**
NASA Ames Research Center, Intelligent Robotics Group, Mountain View, California
"Human-Robot Interaction at CU Boulder"

2016   **Invited Speaker**
Aerospace Ventures (ASV) Day, Boulder, Colorado
"Design Principles for Effective Human-Robot Collaboration"

2015   **Invited Speaker**
University of Iowa, Iowa City, Iowa
"Unlocking the Assistive Potential of Emerging Technologies"

2015   **Colloquium Speaker**
Arizona State University, Tempe, Arizona
"Unlocking the Assistive Potential of Emerging Technologies"

2015   **Colloquium Speaker**
University of Colorado Boulder, Boulder, Colorado
"Unlocking the Assistive Potential of Emerging Technologies"

Intramural Seminars

2016   **Seminar Speaker**
Aerospace Engineering Sciences, University of Colorado Boulder
"Leveraging Cognitive Engineering for Human-Robot Interaction"

2016   **Colloquium Speaker**
Institute of Cognitive Science (ICS), University of Colorado Boulder
"Leveraging Cognitive Engineering for Human-Robot Interaction"

2016   **Seminar Speaker**
Human-Centered Computing (HCC) Seminar, University of Colorado Boulder
"Human Interaction with Small Flying Robots"

2015	**Seminar Speaker**
	Robotics, Controls, and Dynamic Systems (RCDS) Seminar, University of Colorado Boulder
	"Human Interaction with Small Flying Robots"

Teaching

Note: Independent studies are not included in this list.

University of Colorado Boulder

ATLS 2519 Computational Foundations II: Data Structures and Algorithms

Spring 2020–2021
Enrollment: 40–50

OVERALL INSTRUCTOR EVALUATION: N/A (UNIVERSITY STOPPED COLLECTING OVERALL INSTRUCTOR EVALUATION DATA FROM ALL FACULTY COURSE QUESTIONNAIRES)

The ATLAS Institute's undergraduate program in Creative Technologies and Design has a two-course sequence in building programming skills: ATLS 1300: Computational Foundations I and ATLS 2519: Computational Foundations II. These courses are analogous to common sequences at most universities, where ATLS 1300 covers basic programming concepts (variables, conditionals, logical and relational operators, loops, functions, and arrays) and ATLS 2519 covers data structures (lists, stacks, queues, trees, graphs, etc.) and aspects related to algorithms (complexity analysis, sorting, etc.). However, ATLS 2519 had historically received poor course ratings and was falling short of its goals in student outcomes and achieving learning objectives. As a result, I took over the course in Spring 2020 and undertook a complete, ground-up redesign of the course (i.e., all new syllabus, lectures, assignments, textbook, laboratory activities, etc.), with the aim of fostering a love, excitement, and mastery of programming among our students. Due to the Covid-19 pandemic, the University altered its standard practices regarding collecting data to evaluate courses and instructors, making it difficult to quantitatively assess the benefits of my course redesign. However, student qualitative feedback was positive, with comments including: *For the first time in this course I really felt like I understood coding*; *Overall, really learned a lot and really appreciated how you taught the course*; and *I loved the way the class was structured, and all the assignments were practical and effective ways of teaching concepts learned in class*.

CSCI 5402 Research Methods in Human-Robot Interaction

Spring 2016–2019
Enrollment: 10–20

OVERALL INSTRUCTOR EVALUATION: 5.2/6.0

I designed and taught a graduate-level course that introduces students to the field of human-robot interaction (HRI). The course involves three key components: (1) a principles component that develops an understanding of the fundamental concepts of HRI through lectures and discussions of seminal and modern HRI research, (2) a methods component that helps students build a "toolbox" of essential qualitative and quantitative research methods, and (3) a project component in which students use their knowledge of HRI principles and methods to conduct a complete research inquiry, which encompasses posing a novel HRI research question, designing an empirical experiment, collecting and analyzing data, and writing a report of their findings that matches the standards of academic research papers.

CSCI 4616/5616 / ATLS 4519/5519 Introduction to Virtual Reality

Fall 2015–2018
Enrollment: 30–50

OVERALL INSTRUCTOR EVALUATION: 5.8/6.0

I designed and taught a combined undergraduate/graduate course to introduce students to the field of virtual reality. The course involves two key components: (1) developing an understanding of the fundamental principles of virtual reality such as presence, immersion, and engagement and (2) building technical skills for developing virtual reality applications using modern methods and tools, including WebGL and Unity. The course offers students an entry-level introduction to computer graphics and virtual reality using a combination of lectures, hands-on exercises, and team project assignments.

University of Wisconsin–Madison

CS302 Introduction to Programming
Summer 2011
Small Caps: OVERALL INSTRUCTOR EVALUATION: 4.19/5.00 (47 RESPONSES)
Enrollment: 88

I taught a summer section of an introductory programming course in Java. I was responsible for all aspects of the course including developing and delivering lectures, exams, and assignments and supervising TA graders.

CS302 Introduction to Programming
Fall & Spring 2010 – 2012
OVERALL INSTRUCTOR EVALUATION: 4.84/5.00 (65 RESPONSES)
Enrollment: 20 – 25

I taught four semester-long sections (~23 students/section) of an introductory programming course in Java. I was responsible for preparing and presenting lectures, grading, and shared development of assignments and exams with other section instructors. I received **two awards for Excellence in Undergraduate Education** for my work in this course.

Advising & Mentoring

Postdoctoral Advisees

2019 – Present **Midhun Menon, Ph.D.**
Supported by the NASA Postdoctoral Program
Co-advised with Jack Burns (Astrophysical and Planetary Sciences).

Ph.D. Student Advisees

2020 – Present **Bryce Ikeda**
Department of Computer Science, University of Colorado Boulder

2020 – Present **Clare Lohrmann**
Department of Computer Science, University of Colorado Boulder
Co-advised with Alessandro Roncone (Computer Science) and Bradley Hayes (Computer Science).

2020 – Present **Nicholas Conlon**
Department of Computer Science, University of Colorado Boulder
Co-advised with Nisar Ahmed (Aerospace Engineering).

2020 – Present **Wyatt Rees**
Department of Computer Science, University of Colorado Boulder

2017 – Present **Connor Brooks**
Department of Computer Science, University of Colorado Boulder

2017 – Present **Daniel Prendergast**
Department of Computer Science, University of Colorado Boulder

2016 – Present **Michael Walker**
Department of Computer Science, University of Colorado Boulder

2016 – Present **Hooman Hedayati**
Department of Computer Science, University of Colorado Boulder

2015 – Present **Darren Guinness**
Department of Computer Science, University of Colorado Boulder
Co-advised with Shaun Kane (Computer Science)

M.S. Student Advisees

2020 – Present **Alex Mandrila**
ATLAS Institute, University of Colorado Boulder

2020 – Present	**Jon Poulter**
	ATLAS Institute, University of Colorado Boulder
2020 – Present	**Vishwajeet Narwal**
	Department of Computer Science, University of Colorado Boulder
2019 – Present	**Hyerin Seok**
	ATLAS Institute, University of Colorado Boulder

Undergraduate Student Advisees

2020 – Present	**Nicole Gunderson**
	Department of Computer Science, University of Colorado Boulder
2019 – Present	**Daniel Koris**
	Department of Computer Science, University of Colorado Boulder

Graduated and Past Advisees

2019 – 2020	**Corbin Peters**
	B.S., Creative Technologies and Design, ATLAS Institute, University of Colorado Boulder
	Now a XR Engineer at Ethereal Matter Corp.
2018 – 2020	**Arth Beladiya**
	M.S., Department of Computer Science, University of Colorado Boulder
	Now a Robot Deployment Engineer at Dexterity, Inc.
2018 – 2020	**Ashwin Vasan**
	M.S., Department of Computer Science, University of Colorado Boulder
2018 – 2020	**Sky Johnson**
	B.S., Creative Technologies and Design, ATLAS Institute, University of Colorado Boulder
	Now working as a freelance software developer and data engineer.
2018 – 2019	**Alec Leeseberg**
	M.S., Creative Technologies and Design, ATLAS Institute, University of Colorado Boulder
	Master's Thesis: *Folsom Fast VR Trainer*
	Now at GoFire Inc.
2015 – 2019	**Catherine Diaz**
	B.S., Department of Computer Science, University of Colorado Boulder
	Lead author of ISMAR 2017 publication while an undergraduate.
	Senior Thesis: *The Effects of Occlusion and Shadows on Depth Perception in Augmented Reality*
	Now at Microsoft on the HoloLens team.
2018	**Jennifer Lee**
	M.S., Information and Communication Technology for Development (ICTD), ATLAS Institute, University of Colorado Boulder
	Now at Activision.
2017 – 2018	**Brian Sullivan**
	B.S., Department of Computer Science, University of Colorado Boulder
	Senior Thesis: *Formality of Speech for Robots and Humans in Lecture-Style Teaching Situations*
2016 – 2018	**Bo "Bryan" Cao**
	M.S., Department of Computer Science, University of Colorado Boulder
	Master's Thesis: *DiffFrameNet: A Deep Learning Method for Intuitive Robot Navigation*
	Now at the Ph.D. program at Stony Brook University
2016 – 2018	**Meredith Burgess**
	B.S., Department of Computer Science, University of Colorado Boulder
	Senior Thesis: *Graphic Impulse 2.0: Constructing an improvised call and response dance system with unsupervised cluster analysis*
	Now a Software Engineer at NGINX, Inc.

2016 – 2018 **Michael Iuzzolino**
M.S., Department of Computer Science, University of Colorado Boulder
Co-advised with Danielle Albers Szafir (Information Science).
Now at Microsoft Research.

2016 – 2017 **Madhur Atreya**
Ph.D., ATLAS Institute, University of Colorado Boulder
Co-advised with Mark Gross (CS/ATLAS).
Transferred to Mechanical Engineering, now advised by Gregory Whiting.

Ph.D. Thesis Committee Member

2019 – Present **Matthew Whitlock**
Department of Computer Science, University of Colorado Boulder
Adviser: Danielle Szafir
Dissertation Title: *TBD*

2018 – 2019 **John Stechschulte**
Department of Computer Science, University of Colorado Boulder
Adviser: Christoffer Heckman
Dissertation Title: *Information Theory and Probabilistic Modeling for Robot Localization*

2017 – 2019 **Brett Israelsen**
Department of Aerospace Engineering Sciences, University of Colorado Boulder
Adviser: Nisar Ahmed
Dissertation Title: *Algorithmic Assurances and Self-Assessment of Competency Boundaries in Autonomous Systems*

2015 – 2019 **Stephen McGuire**
Department of Aerospace Engineering Sciences, University of Colorado Boulder
Adviser: Nisar Ahmed
Dissertation Title: *Autonomous On-Line Learning of Assistant Selection Policies for Fault Recovery*

2016 **Christine Fanchiang**
Department of Aerospace Engineering Sciences, University of Colorado Boulder
Adviser: David M. Klaus
Dissertation Title: *A Quantitative Human Spacecraft Design Evalaution Model for Assessing Crew Accommodation and Utilization*

M.S. Thesis Committee Member

2020 **Alexander Baughman**
Aerospace Engineering, University of Colorado Boulder
Adviser: Allison Anderson
Dissertation Title: *Evaluation of Virtual and Hybrid Reality Systems for Astronaut Training*

2017 **Rebecca Cox**
Department of Computer Science, University of Colorado Boulder
Adviser: Nikolaus Correll
Dissertation Title: *Merging Local and Global 3D Perception for Robotic Grasping and Manipulation*

2017 **John Lammie**
Department of Computer Science, University of Colorado Boulder
Adviser: Nikolaus Correll
Dissertation Title: *Gesture Recognition in Robotic Skin with Pressure and Proximity Information*

Professional Activities & Service

Program Committee and Editorial Work

2020 – Present	**Program Chair** ACM/IEEE International Conference on Human-Robot Interaction (HRI 2021)
2019 – 2020	**Late-Breaking Reports (LBR) Chair** ACM/IEEE International Conference on Human-Robot Interaction (HRI 2020)
2018 – 2020	**Guest Editor** Journal of Field Robotics (JFR) Special Issue on Space Robotics Volume 37, Issue 5
2016 – 2017	**Videos and Demonstrations Chair** ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017)
2016 – Present	**Program Committee and Program Board Member** ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2018 & 2019 HCII International Conference on Virtual, Augmented, & Mixed Reality (VAMR), 2019 Robotics: Science and Systems (RSS), 2017, 2018, & 2020 ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2017 IEEE Symposium on Robot and Human Interactive Communication (RO-MAN), 2016 & 2017 IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO), 2016

Workshop Organization

2021 – Present	**Workshop Steering Committee Member** HRI Workshop on *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction*, 2021
2017 – Present	**Workshop Organizing Committee Member** HRI Workshop on *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction*, 2018–2020 RSS Workshop on *Space Robotics*, 2017–2019
2014 – 2016	**Workshop Program Committee Member** RSS Workshop on *HRI for Small and Personal Unmanned Aerial Vehicles*, 2016 HRI *Pioneers Workshop*, 2015 AAAI ITS Workshop on *Utilizing EEG Input in Intelligent Tutoring Systems*, 2014
2015	**Panel Chair** HRI Pioneers at the ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015)

Referee Service

2016 & 2018	**Funding Agency Panelist** National Science Foundation (NSF)
2016	**Funding Agency Panelist** National Aeronautics and Space Administration (NASA)
2016, 2017, & 2019	**Funding Agency External Reviewer** National Science Foundation (NSF)
2019	**Funding Agency External Reviewer** National Aeronautics and Space Administration (NASA)

2012 – Present	**Referee for Journal Articles**
	ACM Transactions on Human-Robot Interaction (THRI)
	International Journal of Robotics Research (IJRR)
	ACM Transactions on Computer-Human Interaction (TOCHI)
	IEEE Transactions on Visualization and Computer Graphics (TVCG)
	ACM Transactions on Interactive Intelligent Systems (TiiS)
	IEEE Transactions on Human-Machine Systems (THMS)
	IEEE Transactions on Affective Computing (TAC)
	IEEE Robotics and Automation Magazine (RAM)
2012 – Present	**Referee for Conference Proceedings**
	ACM/IEEE International Conference on Human-Robot Interaction (HRI)
	ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)
	ACM SIGCHI Symposium on User Interface and Software Technology (UIST)
	ACM SIGCHI Conference on Designing Interactive Systems (DIS)
	IEEE International Conference on Robotics and Automation (ICRA)
	IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)
	Robotics: Science and Systems Conference (RSS)
	IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
	IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)
	International Symposium on Robotics Research (ISRR)
	5 Special Recognitions for outstanding reviews: CHI 2018, CHI 2016 (2 reviews), DIS 2016, UIST 2016

University Service

2016 – Present	**CU Boulder Human-Computer Interaction Consortium (HCIC) Committee**
	University of Colorado Boulder
2016 – Present	**Faculty Adviser**
	Virtual Reality Club, University of Colorado Boulder
2015 – Present	**Graduate Program Committee**
	ATLAS Institute, University of Colorado Boulder
	Committee Chair: 2018 – Present
2018 – 2019	**Faculty Search Committee**
	Autonomous Systems Interdisciplinary Faculty Search Committee for the College of Engineering, University of Colorado Boulder
2017 – 2018	**Executive Committee**
	ATLAS Institute, University of Colorado Boulder
2016 – 2017	**Faculty Search Committee**
	Department of Computer Science, University of Colorado Boulder
2016 – 2017 & 2021	**Faculty Search Committee**
	ATLAS Institute, University of Colorado Boulder
2016 – 2017	**Faculty Inclusive Excellence Team**
	BOLD Center, University of Colorado Boulder
2016 – 2017	**Undergraduate Program Committee**
	Department of Computer Science, University of Colorado Boulder
2015 – 2016	**Graduate Program Committee**
	Department of Computer Science, University of Colorado Boulder

External Research Service

2018 – Present **Workshop Organizer:** *Virtual, Augmented and Mixed Reality for HRI*
Workshop at the 2018, 2019, and 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI). Now **Steering Committee Member** for 2021 and beyond.
Co-organizers: Tom Williams (Colorado School of Mines), Tathagata Chakraborti (ASU), Heni Ben Amor (ASU) (2018), and Elizabeth Phillips (USAFA) (2019)

2017–2019 **Workshop Organizer:** *Autonomous Space Robotics*
Workshop at the 2017, 2018, & 2019 Robotics: Science and Systems (RSS) Conference
Co-organizers: Christoffer Heckman (CU Boulder, 2017), Nisar Ahmed (CU Boulder, 2017), Jay McMahon (CU Boulder, 2017), Torin Clark (CU Boulder, 2018), Riccardo Bonalli (Stanford, 2019), Erik Komendera (NASA Langley, 2019), and Marco Pavone (Stanford, 2019)

2016 **Public Safety Communications Research (PSCR) User Interface R&D Working Group**
National Institute of Standards and Technology (NIST) and the National Telecommunications and Information Administration (NTIA)

2014 **Student Volunteer**
ACM/IEEE International Conference on Human-Robot Interaction (HRI)

Volunteering & Outreach

2018–2019 **High School Outreach & Mentoring**
Worked with three high school students from Peak to Peak High School as part of the Boulder Valley School District's Science Research Seminar (SRS), enabling students to gain research experience while completing a senior project as lab interns

2017 **High School Outreach & Mentoring**
Worked with a high school student from the Dawson School, enabling the student to gain research experience while completing a senior project as a lab intern

2017 **Middle School Outreach**
Worked with teachers from the Logan School to create program for 11 middle school students to visit university research labs as part of STEM enrichment program

2016 – 2017 **Hosted Lab Visits**
Hosted open lab event for the public as part of National Robotics Week
Hosted open lab events for the public as part of annual ATLAS Expo

2015 – 2017 **Recruitment Representative**
Hosted "Robotics" table for graduate recruiting at CS Recruitment Day event

2016 **Computer Science Promotional Material Development**
Led creation of promotional video highlighting the University of Colorado Boulder Computer Science Department for use in graduate recruiting and department advertising.

2013 – 2014 **Grandparents University Instructor**
University of Wisconsin-Madison
Taught two sessions (~20 students/session) of a "Social Robotics" major to grandparents and grandchildren. Course used hands-on activities, multi-media presentations, and Lego Mindstorms robots to teach programming and robotics to young and senior students.

Professional and Academic Memberships

Association for Computing Machinery (ACM)	Institute of Electrical and Electronics Engineers (IEEE)	Phi Beta Kappa Honor Society
Alpha Sigma Nu Jesuit Honor Society	Phi Alpha Theta National Historical Honor Society	Golden Key International Honor Society