Ayanna Howard, Ph.D.

Dean, College of Engineering
Monte Ahuja Endowed Dean's Chair
The Ohio State University

I. EARNED DEGREES

B.S. *Computer Engineering*, Brown University, May 1993.

M.S. *Electrical Engineering*, University of Southern California, December 1994.

Ph.D. *Electrical Engineering (Minor: Computer Science),* University of Southern California, May 1999.
- Dissertation: *Recursive Learning for Deformable Object Manipulation*; Thesis advisor: George A. Bekey, Gordon Marshall Professor of Engineering and University Professor

M.B.A. (Masters of Business Administration, concentration in Strategy), Claremont Graduate University, May 2005.

Certification**,** Certificate in Assistive Technology Applications (ATACP), California State University, Northridge - College of Extended Learning, September 2014.

II. PROFESSIONAL

IIA. Academic Positions

- **Associate Professor**, Georgia Institute of Technology 7/05-7/12
  School of Electrical and Computer Engineering (Adjunct in College of Computing, School of IC)

- **Motorola Foundation Professor**, Georgia Institute of Technology 7/12-8/15
  School of Electrical and Computer Engineering (Adjunct in College of Computing, School of IC)

- **Linda J. and Mark C. Smith Chair Professor** 8/15-2/21
  Georgia Institute of Technology, School of Interactive Computing, College of Computing (1/18-present)
  School of Electrical and Computer Engineering, College of Engineering

- **Adjunct Professor** 3/21-present
  Georgia Institute of Technology, School of Interactive Computing, College of Computing
  School of Electrical and Computer Engineering, College of Engineering

- **Professor and Monte Ahuja Endowed Dean's Chair** 3/21-present
  The Ohio State University, (joint) Department of Electrical and Computer Engineering/Department of Computer Science and Engineering, College of Engineering

IIB. Administrative Positions

- **Deputy Manager**, NASA's Jet Propulsion Laboratory 9/03-6/05
  Strategic University Research Partnership Office, Office of Chief Scientist

- **Founder and Director**, Human-Automation Systems (HumAnS) Lab 7/05-present
  Georgia Institute of Technology, *http://humanslab.ece.gatech.edu/*

- **Program Chair – Robotics PhD Program**, Georgia Institute of Technology 8/10-8/13
  College of Engineering and College of Computing

- **Chief Technology Officer and Founder**, Zyrobotics, LLC. 9/13-1/20
  President, Board of Directors, Zyrobotics, INC. 1/20-present
  http://www.zyrobotics.com

- **Associate Director of Research**, Institute for Robotics and Intelligent Machines (IRIM) 11/13-11/15
  Georgia Institute of Technology, *http://robotics.gatech.edu*

- **Associate Chair for Faculty Development**, School of Electrical and Computer Engineering 4/16-12/17
  Georgia Institute of Technology

- **Chair of the School of Interactive Computing**, College of Computing 1/18-2/21
  Georgia Institute of Technology

- **Dean**, College of Engineering 3/21-present
  The Ohio State University

IIC. Advisory Board and Nominated Positions

- Scientific Advisory Committee, National Research Council Study on the Scientific Context for the Exploration of the Moon 2006-2007
- Scientific Advisory Committee, National Research Council Study on NASA's Exploration Technology Development Programs 2007-2008
- Advisory Board, University of Washington On-Ramps into Academia Program 2009-2012
- Scientific Board, NASA's Mars Exploration Rover/Spirit Review Board 2009
- Advisory Board, CEISMC Science, Learning, Design, Engineering, and Robotics Program 2011-2014
- Scientific Review Committee, WTEC Study on the International Assessment of R&D in Human-Robot Interaction (HRI) 2011-2012
- Board Member, CRA Committee on Widening Participation in Computing (CRA-WP) 2014-present
  - Steering Committee, CRA-WP 2018-present
  - Previously: CRA Committee on the Status of Women in Computing Research (CRA-W)
- Scientific Review Committee & Vehicle Intelligence Group Leader, National Academies Panel on Mechanical Science and Engineering at the Army Research Laboratory 2015-2016
- Advisory Board Member, Medtech Women @ Southeastern Medical Device Association 2016-2019
- Advisory Member, DARPA Information Science and Technology (ISAT) Study Group 2016-2019
- Advisory Council, American Association for the Advancement of Science (AAAS) Committee on Opportunities in Science (COOS) 2017-2022
- AnitaB.org Academic Advisory Council 2017-2020
- Board of Directors Member, Computing Research Association (CRA) 2018-2022
- Board Member, Georgia's State Workforce Development Board 2018-2021
- AAAI Executive Councilor, Association for the Advancement of Artificial Intelligence (AAAI) 2018-2021
- Board of Directors Member, Partnership on AI (PAI) 2019-2022
- Board of Directors Member, Autodesk 2019-present
- Board of Directors Member, Black in Robotics 2020-present
- Brown School of Engineering, Engineering Advisory Council (EAC) 2021-2022
- U.S. National Artificial Intelligence (AI) Advisory Committee 2022-present
- Board of Directors Member, Motorola Solutions 2022-present
- Brown University, Board of Trustees 2022-present

IID. Industry/Research Lab Positions

- **Computer Scientist,** Advanced Technology Section 6/93-12/96
  NASA's Jet Propulsion Laboratory, Pasadena, California

- **Information Systems Engineer**, Information Technologies Research Section 1/97-2/99
  NASA's Jet Propulsion Laboratory, Pasadena, California

- **Robotics Researcher**, Telerobotics Research and Applications Group 2/99-9/02
  NASA's Jet Propulsion Laboratory, Pasadena, California

- **Senior Robotics Researcher**, Mobility Systems Concept Development Section 9/02-6/05
  NASA's Jet Propulsion Laboratory, Pasadena, California

- **Visiting Researcher**, Microsoft Research 6/16-7/16
  Microsoft, Seattle, WA

III. HONORS AND RECOGNITIONS

1. JPL Technology and Applications Program (TAP) Honor Award, 2000
2. Lew Allen Award of Excellence for significant technical contributions, 2001
3. San Francisco Airport Museum Honoree, African-American technology trailblazers in Calif., 2002
4. JPL Edward Stone Award for Best Journal Publication, 2003
5. NASA Space Act Award for Path Planning Graphical User Interface, 2003
6. MIT Technology Review Top 100 Young Innovators of the Year, 2003
7. Engineer of the Year Award, Los Angeles Council of Engineers and Scientists, 2004
8. Allstate Insurance Distinguished Honoree for achievement in science, 2004
9. Selected participant, NAE Symposium on Frontiers of Engineering, 2004
10. NASA Space Act Award for Fuzzy Logic Engine for Space Applications, 2004
11. Selected presenter, National Academy of Science Frontiers of Science Symposium, 2005
12. California Women in Business Award for Science and Technology, 2005
13. IEEE Early Career Award in Robotics and Automation, 2005
14. 2006 Class of Young Global Leaders, 2006
15. Selected participant, NAE German-American Frontiers in Engineering Symposium, 2007
16. GT-ECE Outreach Award, 2008
18. GT-Faculty Woman of Distinction Award, 2008
19. NSBE Janice Lumpkin Educator of the Year Award, 2009
20. NAE Gilbreth Lectureship, 2010
21. GT Class of 1934 Outstanding Interdisciplinary Activities Award, 2013
22. GT Residential Life Cornerstone Award for Outstanding Contributions to the Community, 2013
23. A. Richard Newton Educator ABIE Award, Anita Borg Institute, 2014
24. The Root 100 Honoree, 2015
25. 23 of the most powerful women engineers in the world, Business Insider, 2015
26. Computer Research Association's A. Nico Habermann Award, 2016
27. Brown Engineering Alumni Medal, 2016
28. AAAS-Lemelson Invention Ambassador, 2016-2017
29. Atlanta Magazine's Women Making a Mark, 2017
30. Walker's Legacy #WLPower25 Atlanta Award, 2017
31. Women's Empowerment Ministry Innovator of the Year Award, 2018
32. Richard A. Tapia Achievement Award, 2018
33. Top 50 U.S. Women in Tech, Forbes, 2018
34. Thinkers50 Radars Class of 2019
35. Georgia Tech Outstanding Achievement in Research Innovation Award, 2020
36. World's 50 Renowned Women in Robotics, Analytics Insight, 2020
37. Silicon Valley Robotics Champion Award - 'Good Robot' Industry Awards, 2020
38. Georgia Tech Women of Color Faculty Impact Award, 2021
39. IEEE Fellow for "contributions to human-robot interaction systems," 2021
40. Association for the Advancement of Artificial Intelligence (AAAI) Fellow, 2021
41. IEEE RAS Distinguished Service Award, 2021
42. ACM Athena Lecturer Award, 2021
43. USC Viterbi School of Engineering's Mark A. Stevens Distinguished Alumni Award, 2021
44. American Association for the Advancement of Science (AAAS) Fellow for "significant contributions to human-robot interaction and for improving access and equity through artificial intelligence technologies," 2022
45. National Academy of Inventors (NAI) Fellow, 2022
46. Elected Member, American Academy of Arts and Sciences, 2022
47. AAAI/EAAI Patrick Henry Winston Outstanding Educator Award, 2023

IV. INNOVATION/ENTREPRENEURIAL ACCOMPLISHMENTS

IV.A. Technology Innovations (filed by NASA as available for public licensing)

1. Software for Fuzzy Logic Navigation of Mobile Robots, NASA NTR 21199, 2000
2. A Software Tool for Real-Time Terrain Classification, NASA NTR 21234, 2001
3. Cognitive Sensor Technology, NASA NTR 30283, 2001
4. Path Planning Graphical User Interface, NASA NTR 30320, 2001
5. Software for Rover Path Planning using Vision-Based Terrain Characteristics, NASA NTR 30744-CP, 2002
6. Software for Integrating Terrain Maps into Reactive Navigation Strategies, NASA NTR 30794, 2002
7. A Novel Reconfigurable Robot for Navigation on Rough Terrain, NASA NTR 30890, 2002
8. Artificial Intelligence Toolkit to Enhance Understanding and Knowledge, NASA NTR 40496, 2003
9. A Fuzzy Logic Engine for Space Applications, NASA NTR 40461, 2003

IV.B. Patents

1. Patent Application: G. Brant, A. Howard, "Reprise Encryption System for Digital Data," US 2005/0044388 A1, Feb. 24, 2005.
2. Provisional Patent: B. Johns, A. Howard, "BYROBOT – A New Reconfigurable Hybrid Legged-Wheeled Rover," USPTO serial number 61/034,721, March 7, 2008.
3. Patent: A. Howard, et. al. "Methods, Controllers and Computer Program Products for Accessibility to Computing Devices," Patent number: 10281986, Filed: May 2013, Issued: May 2019.
4. Patent: A. Howard, L. Brown, H.W. Park, "Method and System for Facilitating Interactions between A Robot and User," Patent number: 9846843, Filed: October 2014, Issued: December 2017.
5. Patent: A. Howard, J. Harding, "Toy Controller for Providing Input to a Computing Device," Patent number: 9120027, Filed: April 2014, Issued: September 2015.
6. Patent: A. Howard, J. Harding, "Toy Controller for Providing Input to a Computing Device," Patent number: 9310904, Filed: July 2015, Issued: April 2016.
7. Provisional Patent: A. Howard, H. W. Park, J. Harding, "Interactive Therapy Robot System," U.S. Provisional Patent Appl. No. 62/186,106, June 2015.
8. Patent: K. Fry, Y.P. Chen, Faraz, A. Howard, "Detection of Infant Motor Activity During Spontaneous Kicking Movements for Term and Preterm Infants Using Inertial Sensors," U.S. Patent Appl. No. 62/700,781, July 2018.

IV.C. Open-Source Software Releases and Acquisitions

1. Neural network software package for financial forecasting; Acquired by Bitstar International, Seattle, WA, 2001.
2. Information security system using biometrics for database mining. Patent Filed "Reprise Encryption System for Digital Data" in 2003; Acquired by Veritouch Ltd., New York.
3. Artificial Intelligence Toolkit (Released in 2003 on http://www.openchannelsoftware.com) - An educational software package developed to train future scientists and engineers on advanced autonomy technologies and to enhance understanding and knowledge of three soft computing methods, namely fuzzy logic, neural networks, and genetic algorithms.
4. Mars2020 Robotic Adventure Game - A futuristic game/simulation environment developed to introduce middle and high school students to the fundamentals of robotic programming. Over 80 middle school children were trained through various summer workshops during the active grant years 2007–11.
5. Accessible Apps: Decoding of the World for the Visually Impaired (Released in 2012 to IEEE Real World Engineering Projects) - Designed curriculum for first year students that illustrates the real-world contributions engineers make to society by showcasing how they can improve the quality of life for individuals with visual impairments. This real world-engineering project enables students to expand access to the world for the visually impaired by coupling mobile device applications with auditory modality.

IV.D. Entrepreneurial/Innovation Educational Activities

1. I-Natural Vertically Integrated Project Team – Instructed/Managed a multi-year multidisciplinary research team of undergraduate students tasked to design, build, and test interfaces that enable humans to naturally interact with robots (whether physical or virtual) in performing activities of daily living. Long-term goal was to enable significant advancement of large-scale design projects for eventual product commercialization (Jan 2011-May 2016). Awards include: 2012 Cornell Cup Finalist (http://www.systemseng.cornell.edu/intel/), 2016 Robot Art Honorable Mention (http://robotart.org/)
2. Techie-Trekie Living-Learning Community – Faculty host of living-learning community that focused on exploring space exploration opportunities and the limitations/hazards associated with future space colonization (Sept 2010-May 2013).
3. Opportunity Research Scholars (ORS) Faculty Advisor – Faculty advisor to undergraduate research team that

focused on projects to challenge them in developing innovative software and hardware solutions to address robotic challenges (Aug 2010-May 2016).

4. NSF Innovation Corps (I-Corps) Adjunct Faculty – Member of teaching team focused on helping university-led teams foster entrepreneurship that will lead to the commercialization of technology that has been supported previously by NSF-funded research. The I-Corps curriculum provides real-world, hands-on, immersive learning about what it takes to successfully transfer knowledge into products and processes that benefit society. (http://www.nsf.gov/news/special_reports/i-corps/) (April 2016 – June 2016).

V. TEACHING

V.A. Individual Student Guidance

V.A.1. Ph.D. Students

Graduated

1. Brian Smith (co-advisor), "Automatic Coordination and Deployment of Multiple-Robot Systems," Graduation: Spring 2009, Place of Employment: NASA's Jet Propulsion Laboratory, Google.
2. Sekou Remy, "How to Teach a New Robot New Tricks-An Interactive Learning Framework Applied to Service Robotics," Graduation: Fall 2009, Place of Employment: Clemson University, IBM Research.
3. Stephen Williams, "Vision-Based Robot Navigation in Arctic Terrain," Graduation: Summer 2011, Place of Employment: Bossa Nova Robotics.
4. Douglas Brooks, "Towards Quantifying Upper-Arm Rehabilitation Metrics for Children through Interaction with a Humanoid Robot," Graduation: Summer 2012, Place of Employment: Southwest Research Institute.
5. Chung Hyuk Park, "Robot-Based Haptic Perception and Telepresence for the Visually Impaired," Graduation: Summer 2012, Place of Employment: New York Institute of Technology, George Washington University.
6. Lonnie Parker, "Science-Centric Sampling Approaches of Geo-Physical Environments for Realistic Robot Navigation," Graduation: Summer 2012, Place of Employment: Naval Undersea Warfare Center (NUWC)
7. Gregorio Drayer, "Situation-Oriented Integration of Humans and Automation for the Opration of Regenerative Life Support Systems," Graduation: Fall 2013, Place of Employment: Mathworks.
8. Hae Won Park, "Robot Learners: Interactive Instance-Based Learning with Social Robots," Graduation: Spring 2014, Place of Employment: MIT.
9. Richard Coogle, "Using Multiple Agents in Uncertainty Minimization of Ablating Target Sources," Graduation: Fall 2014, Place of Employment: Georgia Tech Research Institute (GTRI).
10. Anthony Spears, "Localization Approaches for Under-Ice Autonomous Robotics Vehicles," Graduation: Fall 2015, Place of Employment: Prioria Robotics.
11. Paul Robinette, "Developing Robot Behaviors that Impact Human-Robot Trust in Emergency Evacuation," Graduation: Fall 2015, Place of Employment: Georgia Tech Research Institute (GTRI).
12. LaVonda Brown, "Developing an Engagement and Social Interaction Model for a Robotics Educational Agent," Graduation: Fall 2015, Place of Employment: Louisiana State University.
13. Kevin DeMarco, "Underwater Human-Robot Interaction (UHRI) to Enable Human-Robot Teaming," Graduation: Fall 2016, Place of Employment: Georgia Tech Research Institute (GTRI).
14. Sergio Garcia, "Coupling of an Objective and Quantifiable Methodology for Assessing Upper-Body Movements with Virtual Reality Gaming Platforms" Graduation: Spring 2017, Place of Employment: Georgia Tech Research Institute (GTRI).
15. Brittney English, "Designing an In-Home Scalable Robotic Arm and Tablet Gaming Suite for Rehabilitation Exercises for Neurological Disorders," Graduation: Fall 2018, Place of Employment: SoarTech.
16. Giancarlo Valentin (co-advisor) "Wearable Interfaces for Symbolic Communication between Humans and Working Dogs," Graduation: Spring 2019, Place of Employment: Intel.
17. Jin Xu, "Human-Robot Trust in Time Sensitive Scenarios" Graduation: Spring 2022, Place of Employment: The Ohio State University.
18. Katelyn Fry, "Development of the Baby SmartyPants: Robotic Systems for the Analysis of Infant Motor Development," Graduation: Spring 2022, Place of Employment: Southwest Research Institute.
19. Shray Bansal (co-advisor), "A Bayesian Framework for Inferring Human-Robot Parallel Play," Graduation: Spring 2023.
20. Victor Emeli, "Robotic System to Motivate Long Term Infant Kicking for Motor Development Progression," Graduation: Fall 2023.

Current

1. De'Aira Bryant, Fall 2017 – present, "Gender and Racial Bias Mitigation in AI," Expected Graduation: Spring 2024.
2. Kantwon Rogers, Fall 2018 – present, "Deception and Trust in Socially Interactive Agents," Expected Graduation: Fall 2024.

V.A.2. M.S. Thesis Students

1. Byron Johns, "Design and Control of a New Reconfigurable Robotic Mobility Platform," M.S. Thesis Graduation: Spring 2007. Place of Employment: Lockheed Martin Missiles and Fire Control, Orlando, FL.
2. Antidio Viguria, "Deployment and Reconfiguration of Multi-Robotic Systems via Distributed Task Allocation Methods," M.S. Thesis Graduation: Summer 2008. Place of Employment: Center for Aerospace Technology, Seville, Spain.
3. Matt Livianu, "Human-in-the-loop Neural Network Control of a Planetary Rover on Harsh Terrain," M.S. Thesis Graduation: December 2008. Place of Employment: Boston Dynamics, Boston, MA.
4. Morenike Ajulo, "Interactive Text Response for Assistive Robotics in the Home," M.S. Thesis Graduation: August 2010. Place of Employment: U.S. Air Force, Utah.
5. Douglas Brooks, "Control of Reconfigurability and Navigation of A Wheel-Legged Robot Based on Active Vision," M.S. Thesis Graduation: Fall 2008. Place of Employment: Southwest Research Institute (SwRI).
6. Mason Nixon, "Utilization of Auditory Cues to Enhance Therapy for Children with Cerebral Palsy," M.S. Thesis Graduation: August 2013. Place of Employment: Space and Missile Defense Command, Huntsville, AL.
7. Bi Ge, "Identifying Engagement from Joint Kinematics Data in Robot Therapy Prompt Interventions for Children with Autism Spectrum Disorder," M.S. Thesis Graduation: Spring 2016. Place of Employment: Amazon, Seattle, WA.
8. Rabeya Jamshad, "Design of a crib mobile to support studies in the early detection of cerebral palsy," M.S. Thesis Graduation: Spring 2019. Place of Employment: UC San Diego PhD Student.
9. Matan Halevy, "Mitigating Racial Biases in Toxic Language Detection," M.S. Thesis Graduation: Fall 2021.

V.A.3. Undergraduate Research Students – Over 85 undergraduate students; Awards - 1st place – NSBE regional poster competition, Best Undergraduate Research Proposal – ECE Fair, People's Choice Award – Intel Scholars competition, President's Undergraduate Research Awards, RESNA Design Competition Finalist, Intel-Cornell Cup Competition Finalists

VI. SCHOLARLY ACCOMPLISHMENTS

***** *Boldface font is used to identify co-authors who were students being advised by Professor Howard*

VI.A. Published Books and Parts of Books

1. E. Tunstel, H. Seraji, A. Howard, Chapter 11: "Soft Computing Approach to Safe Navigation of Autonomous Planetary Rovers," *Intelligent Control Systems Using Soft Computing Methodologies*, Eds. Zilouchian and Jamshidi, CRC Press, 2001.
2. E. Tunstel, A. Howard, T. Huntsberger, A. Trebi-Ollenu, J. Dolan, "Applied Soft Computing Strategies for Autonomous Field Robotics," *Autonomous Robotic Systems: Soft Computing and Hard Computing Methodologies and Applications*, Eds. Zhou, Moravall, and Ruan, vol. 116, pgs. 75-102, Physica-Verlag, 2003.
3. A. Howard, E. Tunstel, "Using Geospatial Information for Autonomous Systems Control," *Frontiers of Geographic Information Technology*, Eds. Rana and Sharma, Springer Science, Dec. 2005.
4. A. Howard, E. Tunstel, "A Self-Contained Traversability Sensor for Safe Mobile Robot Guidance in Unknown Terrain," *Applied Soft Computing Technologies: The Challenge of Complexity*, Abraham, A.; Baets, B.D.; Köppen, M.; Nickolay, B. (Eds.), Springer, May 2006.
5. A. Howard, E. Tunstel (Editors), *Intelligence for Space Robotics*, TSI Press, San Antonio, Texas, July 2006.
6. A. Howard, **S. Remy**, **C.H. Park**, **H.W. Park**, and **D. Brooks**, "Intelligent robotics for assistive healthcare and therapy," *The Path to Autonomous Robots*; G. Sukhatme (Ed.), Springer Science, November 2008.
7. **S. Williams**, **D. Brooks**, A. Howard, "Robot Vision for Science-Driven Navigation in Challenging Arctic Environments," Robot Vision: New Research; T. Matsuda (Ed.), Nova Science, 2009.
8. **S. García-Vergara**, **L. Brown**, **H.W. Park**, and Ayanna M. Howard, "Engaging Children in Play Therapy: The Coupling of Virtual Reality (VR) Games With Social Robotics," *Serious Games, Alternative Realities, and Play Therapy*; A. Brooks, S. Braham, L. Jain (Eds.), Studies in Computational Intelligence (Springer SCI), 2013.

9. **G. E. Drayer** and A.M. Howard, "A Granular Sensor-Fusion Method for Regenerative Life Support Systems," *Multisensor Data Fusion: From Algorithms and Architectural Design to Applications*; H. Fourati (Ed.), CRC Press, 2015.
10. J. Borenstein, A. Howard, A. Wagner, "Pediatric Robotics and Ethics: The Robot is Ready to See You Now But Should It Be Trusted?" Robot Ethics 2.0, P. Lin, K. Abney, G. Bekey (Eds.), Oxford University Press, 2017.
11. **P. Robinette**, A.R. Wagner, A. Howard, "Investigating Human-Robot Trust in Emergency Scenarios: Methodological Lessons Learned," In R. Mittu, D. Sofge, A. Wagner, & W. Lawless, *Robust Intelligence and Trust in Autonomous Systems* (pp. 143-166). Boston: Springer, 2016.
12. **P. Robinette**, A. Howard, A.R. Wagner, "Conceptualizing Overtrust in Robots: Why Do People Trust a Robot That Previously Failed?," Autonomy and Artificial Intelligence: A threat or savior?, F. Lawles, R. Mittu, D. Sofge, S. Russell (Eds), Springer, November 2017.
13. A. Howard, Y.P. Chen, **C. H. Park**, "From Autism Spectrum Disorder to Cerebral Palsy: State-of-the-Art in Pediatric Therapy Robots," Encyclopedia of Medical Robotics, J. P. Desai (Ed.), World Scientific Publishing Company, pp. 241-261 (2018).
14. A. Howard, Sex, Race, and Robots: Being Human in the Age of AI, Amazon Audible, Sept. 2020.

VI.B. Refereed Publications

VI.B.1. Refereed Journal Publications

1. A. Howard, C. Padgett, "A generalized approach to real-time pattern recognition in sensed data," *Pattern Recognition*, vol. 32:12, pgs. 2069-2071, Dec. 1999.
2. A. Howard, G. Bekey, "Intelligent Learning for Deformable Object Manipulation," *Autonomous Robots*, 9 (1): pgs. 51-58, August 2000.
3. A. Howard, H. Seraji, "Vision-Based Terrain Characterization and Traversability Assessment," *Journal of Robotic Systems*, 18(10), pgs. 577-587, 2001.
4. A. Howard, H. Seraji, "An Intelligent Terrain-Based Navigation System for Planetary Rovers," *IEEE Robotics and Automation Magazine*, vol. 8, no. 4, pgs. 9-17, December 2001.
5. H. Seraji and A. Howard, "Behavior-Based Navigation on Challenging Terrain: A Fuzzy Logic Approach*," IEEE Transactions on Robotics and Automation*, 18(3), pgs. 308-321, June 2002.
6. E. Tunstel, A. Howard, H. Seraji, "Rule-based reasoning and neural network perception for safe off-road robot mobility," *Expert Systems*, 19(4), pgs. 191-200, Sept. 2002.
7. E. Tunstel, A. Howard, "Approximate Reasoning for Safety and Survivability of Planetary Rovers," *Fuzzy Sets and Systems*, vol. 134, no. 1, pgs. 27-46, Feb. 2003.
8. A. Howard, C. Padgett, "An Adaptive Learning Methodology for Intelligent Object Detection in Novel Imagery Data," *NeuroComputing*, vol. 51, pgs. 1-11, March 2003.
9. A. Howard, H. Seraji, "Multi-Sensor Terrain Classification for Safe Spacecraft Landing*," IEEE Transactions on Aerospace and Electronic Systems*, vol. 40, Issue 4, pgs. 1122-1131, October 2004.
10. A. Howard, H. Seraji, B. Werger, "Global and Regional Path Planners for Integrated Planning and Navigation," *Journal of Robotic Systems*, vol. 22, no. 12, pgs. 767-778, December 2005.
11. Z. Dodds, L. Greenwald, A. Howard, S. Tejada, J. Weinberg, "Components, Curriculum, and Community: Robots and Robotics in Undergraduate AI Education," *AI Magazine*, Vol. 27, pgs. 11-22, Spring 2006.
12. A. Howard, "A Systematic Approach to Predict Performance of Human-Automation Systems," *IEEE Transactions on Systems, Man, and Cybernetics--Part C*, Vol. 37, No. 4, July 2007.
13. A. Howard, **L. Parker**, **B. Smith**, "A Learning Approach to Enable Locomotion of Multiple Robotic Agents Operating in Natural Terrain Environments," *International Journal of Intelligent Automation and Soft Computing*, Vol. 14(1), pgs. 47-59, 2008.
14. A. Howard, **S. Remy**, "Utilizing Virtual Environments to Enable Learning in Human-Robot Interaction Scenarios," *International Journal of Virtual Reality*, Vol. 7(1), pgs. 9-14, 2008.
15. **S. Remy**, A. Howard, "Learning Approaches Applied to Human-Robot Interaction for Space Missions," *International Journal of Intelligent Automation and Soft Computing*, Vol. 14, No. 3, pgs. 249-262, 2008.
16. **B. Smith**, M. Egerstedt, A. Howard, "Automatic Generation of Persistent Formations for Multi-Agent Networks Under Range Constraints," *ACM/Springer Mobile Networks and Applications Journal,* Vol. 14, No. 3, pgs. 322 – 335, 2009.
17. **B. Smith**, A. Howard, J. McNew, Jiuguang-Wang, M. Egerstedt, "Multi-robot deployment and coordination with Embedded Graph Grammars," *Autonomous Robots*, Vol. 26 (1), pgs. 79-98, January 2009.
18. **A. Viguria**, A. Howard, "An Integrated Approach for Achieving Multi-Robot Task Formations," *IEEE/ASME Transactions on Mechatronics*, Vol. 14 (2), pgs. 176-186, April 2009.

19. **S. Williams**, A. Howard, "Developing Monocular Visual Odometry and Pose Estimation for Arctic Environments," *Journal of Field Robotics*, Vol. 27(2), pgs. 145-157, March 2010.
20. **A. Viguria**, A. Howard, "Probabilistic Analysis of Market-Based Algorithms for Initial Robotic Formations," *International Journal of Robotics Research*, Vol. 29, No. 9, pgs. 1154–1172, August 2010.
21. **S. Williams**, **L. Parker**, A. Howard, "Calibration and Validation of Earth-observing Sensors using Deployable Surface-based Sensor Networks," *IEEE Journal of Selected Topics in Earth Observations and Remote Sensing*, Vol. 3, No. 4, pgs. 427-432, Dec. 2010.
22. **A. Howard**, **B. Jones**, N. Serrano, "An Integrated Sensing Approach for Entry, Descent, and Landing of a Robotic Spacecraft," *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 47(1), pgs. 295-304, Jan. 2011.
23. M.B. Blake, **S. Remy**, A. Howard, "Towards Robotic Access to WWW Resources Using Service-Oriented Computing and Web Interfaces," *IEEE Robotics and Automation Magazine*, Vol. 18(2), pgs. 33-43, June 2011.
24. **D. Brooks**, A. Howard, "Quantifying Upper-Arm Rehabilitation Metrics for Children through Interaction with a Humanoid Robot," *Applied Bionics and Biomechanics*, Vol. 9(2), pgs. 157-172, 2012.
25. A. Howard, **C.H. Park**, **S. Remy**, "Using Haptic and Auditory Interaction Tools to Engage Students with Visual Impairments in Robot Programming Activities," *IEEE Transactions on Learning Technologies*, Vol. 5(1), pgs. 87-95, Jan 2012.
26. **S. Williams**, **L. Parker**, A. Howard, "Terrain Reconstruction of Glacial Surfaces via Robotic Surveying Techniques," *IEEE Robotics and Automation Magazine*, Vol. 10(4), pgs. 59-71, December 2012.
27. **C. H. Park**, A. M. Howard, "Telepresence Robotic Technology for Individuals with Visual Impairments Through Real-time Haptic Rendering," *Journal of Korea Robotics Society*, vol. 8(3), Sept. 2013.
28. R. Dorsey, **C.H. Park**, A. Howard "Developing the Capabilities of Blind and Visually Impaired Youth to Build and Program Robots," *Journal on Technology and Persons with Disabilities*, Vol. 1, pg. 57-69, 2014.
29. G. Drayer, A. Howard, "Modeling and Simulation of an Aquatic Habitat for Bioregenerative Life Support Research," *Acta Astronautica*, Volume 93, Pages 138–147, January 2014.
30. Y-P. Chen, S. Lee, A. Howard, "Effect of Virtual Reality on Improving Upper-Extremity Function in Children with Cerebral Palsy: A Meta-Analysis," *Pediatric Physical Therapy*, 2014 Fall; 26(3):289-300.
31. **C. H. Park**, A. Howard, "Robotics-based Telepresence using Multi-modal Interaction for Individuals with Visual Impairments," *International Journal of Adaptive Control and Signal Processing*, doi: 10.1002/acs.2519, June 2014.
32. A. Howard, **H.W. Park**, "Using Tablet Devices to Engage Children with Disabilities in Robotic Educational Activities," *Journal on Technology and Persons with Disabilities*, vol. 2:96-107, Dec. 2014, http://hdl.handle.net/10211.3/133378.
33. Y-P. Chen, A. Howard, "Effects of robotic therapy on upper-extremity function in children with cerebral palsy: A systematic review," *Developmental Neurorehabilitation*, 19(1), pp. 64-71. Epub 2014 Apr 11, doi:10.3109/17518423.2014.899648.
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VI.B.2. Refereed Conference Publications

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3. A. Howard, C. Padgett, K. Brown, "Intelligent Target Detection in Hyperspectral Imagery," *13th Intern. Conference on Applied Geologic Remote Sensing*, Vancouver, Canada, March 1999.
4. A. Howard, G. Bekey, "Intelligent Learning for Deformable Object Manipulation*," IEEE Intern. Symposium on Computational Intelligence in Robotics and Automation*, pgs. 15-20, Monterey Bay, CA, Nov. 1999.
5. A. Howard, C. Padgett, K. Brown, "Real Time Intelligent Target Detection and Analysis with Machine Vision," *3rd International Symposium on Intelligent Automation and Control*, Maui, HI, June 2000.
6. A. Howard, G. Bekey, "A Learning Methodology for Robotic Manipulation of Deformable Objects," *8th International Symposium on Robotics and Applications*, Maui, HI, June 2000.

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36. A. Howard, **G. Cruz**, "Adapting Human Leadership Approaches for Role Allocation in Human-Robot Navigation Scenarios," *11th Int. Symposium on Robotics and Applications*, Budapest, Hungary, July 2006.
37. A. Howard, "Fuzzy logic selection of surface feature observations for small proximity operations," *6th International Symposium on Soft Computing for Industry*, Budapest, Hungary, July 2006.
38. A. Howard, **B. Smith**, M. Egerstedt, "Realization of the Sensor Web Concept for Earth Science using Mobile Robotic Platforms," *IEEE Aerospace Conference*, Big Sky, Montana, March 2007.
39. A. Howard, E. Graham, "To Encourage and Excite the Next Generation of Engineers through Human-Robot Interaction Projects for Space Exploration," *American Society for Engineering Education Annual Conference*, Hawaii, June 2007.
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41. **B. Johns**, A. Howard, "Stability and Gait Optimization of a Hybrid Legged-Wheeled Rover," *10th International Conference on Climbing and Walking Robots (CLAWAR)*, pgs. 226- 233, Singapore, July 2007.
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55. **S. Remy**, A. Howard, "Predicting the Robot Learning Curve based on Properties of Human Interaction," *AAAI Symp. on Agents that Learn from Human Teachers*, San Jose, CA, March 2009.
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57. **S. Remy**, **C.H. Park**, A.M. Howard, "Improving the performance of ANN training with an unsupervised filtering method," *Int. Joint Conf. on Neural Networks*, pgs. 2627-2633, Atlanta, GA, June 2009.
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60. **D. Brooks**, A. Howard, "Upper Limb Rehabilitation and Evaluation of Children Using a Humanoid Robot," 2nd *Workshop on Child, Computer, and Interaction*, Cambridge, MA, Nov. 2009.
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72. R. Dorsey, A. Howard, "Measuring the Effectiveness of Robotics Activities in Underserved K-12 Communities outside the Classroom," *American Society for Engineering Education Annual Conf*, Vancouver, CA, June 2011.
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74. **G. Drayer**, A. Howard, "A FAM-based Switched Control Approach for the Automation of Bioregenerative Life Support Systems," *41st International Conference of Environmental Systems*, Portland, OR, July 2011.
75. **P. Robinette**, A. Howard, "Emergency Evacuation Robot Design," 3rd Int. Joint Topical Meeting on Emergency Preparedness & Response and Robotics & Remote Systems, Knoxville, TN, August 2011.
76. **P. Robinette**, A. Howard, "Incorporating a Model of Human Panic Behavior for Robotic-Based Emergency Evacuation," *IEEE Int. Sym. on Robot and Human Interactive Communication*, August 2011, Atlanta, GA.
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78. **L. Parker**, A. Howard, "Adaptive Robot Navigation Protocol for Estimating Variable Terrain Elevation Data," *IEEE Int. Conf. on Systems, Man, and Cybernetics*, Anchorage, AK, Oct. 2011.
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80. **C.H. Park**, A. Howard, "Real World Haptic Exploration for Telepresence of the Visually Impaired," *ACM/IEEE International Conference on Human-Robot Interaction (HRI 2012)*, Boston, MA, March 2012.
81. **G. Drayer**, A. Howard, "A Granular Approach to the Automation of Bioregenerative Life Support Systems that Enhances Situation Awareness" *2012 IEEE Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)*, New Orleans, LA, March 2012.
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83. **J. Gregory**, A. Howard, C. Boonthum-Denecke, "Wii Nunchuk Controlled Dance Pleo! Dance! to Assist Children with Cerebral Palsy by Play Therapy," *25th Int. Florida Artificial Intelligence Research Society Conference*, May 2012.

84. **D. Brooks,** Y-P. Chen, A. Howard**, "**Simulation versus Embodied Agents: Does either induce better human adherence to physical therapy exercise?**"** *IEEE Int. Conf. on Biomedical Robotics and Biomechatronics (BioRob)*, Rome, Italy, June 2012.
85. **H. Taylor**, B. Lee, J. Jhingory, **G. Drayer**, A. Howard, "Development and Evaluation of User Interfaces for Situation Observability in Life Support Systems." *42nd International Conference on Environmental Systems (ICES)*, San Diego, California, July 2012.
86. **L. Roberts**, **H.W. Park**, and A. M. Howard, "Robots and Therapeutic Play: Evaluation of a Wireless Interface Device for Interaction with a Robot Playmate," *34th Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'12)*, San Diego, California, August 2012.
87. **P. Robinette**, A. M. Howard, "Trust in Emergency Evacuation Robots," *10th IEEE International Symposium on Safety Security and Rescue Robotics (SSRR 2012)*, College Station, TX, Nov. 2012.
88. **G. Valentin**, A. Howard, "Dealing with Childhood Obesity: Passive versus Active Activity Monitoring Approaches for Engaging Individuals in Exercise," *IEEE Biorobotics and Biosignals Conference*, Brazil, February 2013.
89. **H. W. Park**, A. Howard, "TabAccess, a Wireless Controller for Tablet Accessibility for Individuals with Limited Upper-Body Mobility," *IEEE Biorobotics and Biosignals Conference*, Brazil, February 2013.
90. **P. Robinette**, A. Wagner, A. Howard, "Building and Maintaining Trust Between Humans and Guidance Robots in an Emergency," *2013 AAAI Spring Symposium: Trust and Autonomous Systems*, Stanford, CA, March 2013.
91. **C.H. Park**, A. Howard, "Real-Time Haptic Rendering and Haptic Telepresence Robotic System for the Visually Impaired," *IEEE World Haptics Conference 2013*, Daejon, Korea, April 2013.
92. **L. Parker**, **R. Coogle**, A. Howard, "Estimation-Informed, Resource-Aware Robot Navigation for Environmental Monitoring Applications," *IEEE Int. Conf. on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013.
93. **C.H. Park**, A. Howard, "Engaging Students with Visual Impairments in Engineering and Computer Science through Robotic Game Programming," *120th American Society for Engineering Education (ASEE) Annual Conference*, Atlanta, GA, June 2013.
94. **C.H. Park**, K. Wilson, A. Howard, "Examining the Learning Effects of a Low-Cost Haptic-Based Virtual Reality Simulator on Laparoscopic Cholecystectomy," *26th IEEE Int. Symposium on Computer-Based Medical Systems*, Porto, Portugal, June 2013.
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97. **M. E. Nixon**, A. M. Howard, Y-P. Chen, "Quantitative Evaluation of the Microsoft Kinect for Use in an Upper Extremity Virtual Rehabilitation Environment," *Int. Conf. on Virtual Rehabilitation (ICVR)*, Philadelphia, PA, August 2013.
98. **K. DeMarco**, M. West, A. Howard, "A Forward-Looking Sonar Simulation for Underwater Human-Robot Interaction Scenarios," *IEEE OCEANS Conference*, San Diego, CA, September 2013.
99. **L. Brown**, R. Kerwin, A. Howard, "Applying Behavioral Strategies for Student Engagement Using a Robotic Educational Agent," *IEEE Int. Conf. on Systems, Man, and Cybernetics,* Manchester, UK, Oct. 2013 (*Best Paper Award Finalist*).
100. **M. Nixon**, A. Howard, "Applying Gaming Principles to Virtual Environments for Upper Extremity Therapy Games," *IEEE Int. Conf. on Systems, Man, and Cybernetics, Manchester*, UK, Oct. 2013.
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102. **R. Coogle**, A. Howard, "The Iceberg Observation Problem: Using Multiple Agents to Monitor and Observe Ablating Target Sources," *IEEE Int. Conf. on Systems, Man, and Cybernetics, Manchester*, UK, Oct. 2013.
103. **L. Brown**, A. Howard, "Engaging Children in Math Education using a Socially Interactive Humanoid Robot," *IEEE-RAS International Conference on Humanoid Robots*, Atlanta, GA, Oct. 2013.
104. **L. Brown**, A. Howard, "The Positive Effects of Verbal Encouragement in Mathematics Education Using A Social Robot," *IEEE Integrated STEM Education Conference*, Princeton, NJ, March 2014 (*Best Paper Award; 2020 Top 5 cited papers in 10-year history*).
105. **A. Spears,** M. West, T. Collins, A. Howard, "Determining Underwater Vehicle Movement from Sonar Data in Relatively Featureless Seafloor Tracking Missions," *IEEE Winter Applications of Computer Vision Conference*, Steamboat Springs, CO, March 2014.

106. **S. García-Vergara,** A. Howard, "Three-Dimensional Fitt's Law Model used to Predict Movement Time in Serious Games for Rehabilitation," *Human-Computer Interaction (HCI) International Conference*, Crete, Greece, June 2014.
107. **H. W. Park, R. Coogle,** A. Howard, "Using a Shared Tablet Workspace for Interactive Demonstrations during Human-Robot Learning Scenarios," *IEEE Int. Conf. on Robotics and Automation (ICRA)*, Hong Kong, China, June 2014.
108. **C.H. Park**, A. Howard, "Haptic Visualization of Real-World Environmental Data for Individuals with Visual Impairments," *Human-Computer Interaction (HCI) International Conference*, Crete, Greece, June 2014.
109. **G. Drayer**, A. Howard, "Evaluation of an Introductory Embedded Systems Programming Module using Hands-on Learning Methods," *121st American Society for Engineering Education (ASEE) Annual Conference*, Indianapolis, IN, June 2014.
110. **L. Brown**, A. Howard, "A Real-Time Model to Assess Student Engagement during Interaction with Intelligent Educational Agents," *121st American Society for Engineering Education (ASEE) Annual Conference*, Indianapolis, IN, June 2014.
111. **H. W. Park,** A. Howard, "Engaging Children in Social Behavior: Interaction with a Robot Playmate Through Tablet-Based Apps," *Rehabilitation Eng. and Technology Society of North America (RESNA) Annual Conference*, Indianapolis, IN, June 2014.
112. J. MacCalla, A. Howard, "A Plush Switch for Accessing Tablet-Based Applications for Children with Mild to Severe Motor Limitations," *Rehabilitation Eng. and Technology Society of North America (RESNA) Annual Conference*, Indianapolis, IN, June 2014.
113. **L. Brown**, A. Howard, "Gestural Behavioral Implementation on a Humanoid Robotic Platform for Effective Social Interaction," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Edinburgh, Scotland, August 2014.
114. **P. Robinette**, A. Wagner, A. Howard, "Assessment of Robot Guidance Modalities Conveying Instructions to Humans in Emergency Situations," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Edinburgh, Scotland, August 2014.
115. **S. Garcia-Vergas**, M. Serrano, Y.P. Chen, A. Howard, "Developing a Baseline for Upper-Body Motor Skill Assessment using a Robotic Kinematic Model," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Edinburgh, Scotland, August 2014.
116. C.H. Park, K. Wilson, A. Howard, "Pilot Study: Supplementing Surgical Training for Medical Students Using a Low-Cost Virtual Reality Simulator," *26th IEEE Int. Symposium on Computer-Based Medical Systems*, New York, May 2014.
117. **A. Spears**, M. West, B. Schmidt, T. Collins, and A. M. Howard, "Modification of the Yellowfin Autonomous Underwater Vehicle for Use in Under-Ice Missions," *AUVSI's Unmanned Systems*, Orlando, FL, May 2014.
118. **A. Spears**, M. West, T. Collins, and A. M. Howard, "Evaluation of Sonar and Video Data Collection Efforts in an Under-Ice Environment Using an Unmanned Underwater Vehicle," *IEEE Int. Conf. on Systems, Man, and Cybernetics*, San Diego, CA, May 2014.
119. **K. DeMarco**, M. West, and A. M. Howard, "Underwater Human-Robot Communication: A Case Study with Human Divers," *IEEE Int. Conf. on Systems, Man, and Cybernetics*, San Diego, CA, May 2014.
120. **A. Spears**, M. West, T. Collins, and A. M. Howard, "Acoustic Sonar and Video Sensor Fusion for Landmark Detection in an Under-Ice Environment," *IEEE OCEANS Conference*, St. John's, New Newfoundland, September 2014.
121. **A. Spears**, M. West, T. Collins, M. Meister, B. Schmidt, and A. M. Howard, "Design and Development of an Under-Ice Autonomous Underwater Vehicle for use in Polar Regions" *IEEE OCEANS Conference*, St. John's, New Newfoundland, September 2014.
122. **K. DeMarco**, M. West, and A. M. Howard, "Autonomous Robot-Diver Assistance through Joint Intention Theory," *IEEE OCEANS Conference*, St. John's, New Newfoundland, September 2014.
123. **B. English**, A. Howard, "Engagement Study of an Integrated Rehabilitation Robotic Tablet-Based Gaming System," *IEEE Int. Workshop on Advanced Robotics and its Social Impacts*, Evanston, IL, Sept. 2014.
124. A. Howard, J. MacCalla, "Pilot Study to Evaluate the Effectiveness of a Mobile-Based Therapy and Educational App for Children," *ACM Sensys Workshop on Mobile Medical Applications – Design and Development*, Memphis, TN, Nov. 2014.
125. **B. English**, A. Howard, "Encouraging Specific Intervention Motions via a Robotic System for Rehabilitation of Hand Function," *IEEE Symp. on Computational Intelligence in Robotic Rehabilitation and Assistive Technologies*, Orlando, Florida, Dec. 2014.
126. H. W. Park, A. Howard, "Robot Learners: Interactive Instance-Based Learning and Its Application to Therapeutic Tasks," *AI for Human-Robot Interaction, 2014 AAAI Fall Symposium*, Arlington, VA, Nov. 2014.

127. L. Conrad, A. Howard, "The Impact of a Robotics Summer Undergraduate Research Experience on Increasing the Pipeline to Graduate School," *American Society for Engineering Education (ASEE) Annual Conference*, Seattle, WA, June 2015.
128. **S. García-Vergara**, H. Li, A. Howard, "Increasing Super Pop VR™ Users' Intrinsic Motivation by Improving the Game's Esthetics," *Human-Computer Interaction (HCI) International Conference*, Los Angeles, CA, August 2015.
129. J. MacCalla, J. Xu, A. Howard, "Enhancing Self-Motivation through Design of an Accessible Math App for Children with Special Needs," *Human-Computer Interaction (HCI) International Conference*, Los Angeles, CA, August 2015.
130. C. H. Park, N. Pai, J. Bakthavatchalam, Y. Li, M. Jeon, A. Howard, "Robotic Framework for Music-based Emotional and Social Engagement with Children with Autism," *AAAI-15 Workshop on Artificial Intelligence Applied to Assistive Technologies and Smart Environments*, Austin, TX, Jan. 2015.
131. J. MacCalla, J. Xu, A. Howard, "Integration of Common Core Math Standards into Gaming Apps for Children with Motor Limitations," *Rehabilitation Eng. and Technology Society of North America (RESNA) Annual Conference*, Denver, CO, June 2015.
132. **A. Moreno**, C. Rozell, A. Howard, "Restricting Vocabulary Size in Pediatric Augmentative and Alternative Communication," *Rehabilitation Eng. and Technology Society of North America (RESNA) Annual Conference*, Denver, CO, June 2015.
133. H.W. Park, A. Howard, "Retrieving Experience: Interactive Instance-based Learning Methods for Building Robot Companions," *IEEE Int. Conf. on Robotics and Automation (ICRA)*, Seattle, WA, May 2015.
134. **L. Brown, S. Garcia-Vergas,** A. Howard, "Evaluating the Effect of Robot Feedback on Motor Skill Performance in Therapy Games," *IEEE Int. Conf. on Systems, Man, and Cybernetics,* Hong Kong, Oct. 2015.
135. C. H. Park, M. Jeon, A. Howard, "Robotic Framework with Multi-Modal Perception for Physio-Musical Interactive Therapy for Children with Autism," *5th Int. Conf. on Development and Learning and on Epigenetic Robotics*, Providence, RI, Aug 2015.
136. **P. Robinette**, A. Howard, and A. R. Wagner, "Timing is Key for Robot Trust Repair," *7th International Conference on Social Robotics (ICSR 2015),* Paris, France, Oct. 2015.
137. **A. Spears**, M. West, M. Meister, C. Walker, J. Buffo, T. Collins, A. Howard, B. Schmidt, "Design and Antarctic Testing of the Icefin Vehicle," *IEEE OCEANS Conference*, Washington, DC., Oct. 2015.
138. **A. Spears**, M. West, T. Collins, A. Howard, "Automatic Texture and Anomaly Mapping in Under-Ice Video Datasets," *IEEE OCEANS Conference*, Washington, DC., Oct. 2015.
139. **A. Spears**, M. West, T. Collins, A. Howard, "Sonar and Video Fusion for Vehicle Trajectory Estimation in Under-Ice Envrionments," *IEEE OCEANS Conference*, Washington, DC., Oct. 2015.
140. **G. Valentin**, J. Alcaidinho, M. Jackson, A. Howard, T. Starner, "Towards a canine-human communication system based on head gestures," *12th International Conference on Advances in Computing Entertainment (ACE)*, Malaysia, Nov. 2015.
141. **P. Robinette**, W. Li, R. Allen, A. Howard, A. Wagner, "Overtrust of Robots in Emergency Evacuation Scenarios," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, New Zealand, March 2016.
142. **P. Cloutier**, H. W. Park, J. MacCalla, A. Howard, "It's All in the Eyes: Designing Facial Expressions for an Interactive Robot Therapy Coach for Children," *8th Cambridge Workshop on Universal Access and Assistive Technology*, Cambridge, UK, March 2016.
143. R. Zhang, J. Barnes, J. Ryan, M. Jeon, C. H. Park and A. Howard, "Musical Robots for Children with ASD using a Client-Server Architecture," *22nd Annual Int. Conference on Auditory Display*, Canberra, Australia, July 2016.
144. **P. Robinette**, A. Wagner, A. Howard, "Assessment of Robot to Human Instruction Conveyance Modalities Across Virtual, Remote and Physical Robot Presence," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), New York, NY, August 2016.
145. **S. García-Vergara**, **L. Brown**, Y.P. Chen, A. Howard, "Increasing the Efficacy of Rehabilitation Protocols for Children via a Robotic Playmate Providing Real-time Corrective Feedback," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), New York, NY, August 2016.
146. M. Serrano, Y.P. Chen, A. Howard, P. Vela, "Automated Feet Detection for Clinical Gait Assessment," *Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'16),* Orlando, FL, August 2016.
147. M. Serrano, Y.P. Chen, A. Howard, P. Vela, "Lower Limb Pose Estimation for Monitoring the Kicking Patterns of Infants," *Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'16)*, Orlando, FL, August 2016.
148. **G. Valentin**, "Creating Collar-sensed Motion Gestures for Dog-Human Communication in Service Applications," *20th International Symposium on Wearable Computers (ISWC)*, Heidelberg, Germany, Sept. 2016.

149. **K. DeMarco**, N. Toit, A.M. Howard, "Tracking Multiple Fragmented Objects with 2D Imaging Sonar," *IEEE Oceans Conference*, Monterey, CA, Sept. 2016.
150. **K. DeMarco**, A.M. Howard, "Classifying Objects in 2D Imaging Sonar via Tracking of Diver Fins," *IEEE Oceans Conference*, Monterey, CA, Sept. 2016.
151. **A. Spears**, M. West, B. Schmidt, T. Collins, A. Howard, "Under-ice Camera and Sonar Simulation for Visual Navigation," *IEEE Oceans Conference*, Monterey, CA, Sept. 2016.
152. **B. Ge**, H.W. Park, A. Howard, "Identifying Engagement from Joint Kinematics Data for Robot Therapy Prompt Interventions for Children with Autism Spectrum Disorder," *8th International Conference on Social Robotics (ICSR 2016)*, Kansas City, MO, Nov. 2016.
153. **D. Bryant, J. Boyd, J. Harris, M. Smith, S. García-Vergara**, Y-P. Chen, A. Howard, "An Infant Smart-Mobile System to Encourage Kicking Movements in Infants At-Risk of Cerebral Palsy," *IEEE International Workshop on Advanced Robotics and its Social Impacts*, Austin, TX, March, 2017.
154. A. Howard, C. Zhang, E. Horvitz, "Addressing Bias in Machine Learning Algorithms: A Pilot Study on Emotion Recognition for Intelligent Systems," *IEEE International Workshop on Advanced Robotics and its Social Impacts*, Austin, TX, March, 2017.
155. **B. English**, A. Howard, "The Effects of Musical Cues on Motor Learning Using a Robotic Wrist Rehabilitation System," *IEEE International Workshop on Advanced Robotics and its Social Impacts*, Austin, TX, March, 2017.
156. **J. Xu**, A. Howard, "Pilot Study for Examining Human-Robot Trust In Healthcare Interventions Involving Sensitive Personal Information," Rehabilitation Eng. and Technology Society of North America (RESNA) Annual Conference, New Orleans, LA, June 2017.
157. J. Barnes, M. FakhrHosseini, M. Jeon, C-H. Park, A. Howard, "The Influence of Robot Design on Acceptance of Social Robots," *International Conference on Ubiquitous Robots and Ambient Intelligence*, Korea, June 2017.
158. M FakhrHosseini, D. Lettinga, E. Vasey, Z. Zheng, M. Jeon, C-H. Park, A. Howard, "Both 'Look and Feel' Matter: Essential Factors for Robotic Companionship," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Lisbon, Portugal, August 2017.
159. M. FakhrHosseini, J. Barnes, S. Hilliger, M. Jeon, C-H. Park, A. Howard, "Love at First Sight: Mere Exposure to Robot Appearance Leaves Impressions Similar to Interactions with Physical Robots," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Lisbon, Portugal, August 2017.
160. **B. English**, A. Howard, "The Effects of Auditory and Visual Cues on Timing Synchronicity for Robotic Rehabilitation," *IEEE-RAS-EMBS International Conference on Rehabilitation Robotics (ICORR),* July 2017.
161. E. Vasey, M. S. FakhrHosseini, Z. Zheng, C-H. Park, A. Howard, M. Jeon, "Development and Usability Testing of a Remote Control App for an Interactive Robot," *Human Factors and Ergonomics Society Annual Meeting,* Austin, Texas, Oct. 2017.
162. **B. English**, **A. Coates**, A. Howard, "Recognition of Gestural Behaviors Expressed by a Humanoid Robotic Platform for Teaching Affect Recognition to Children with Autism - A Healthy Subjects Pilot Study," *9th International Conference on Social Robotics*, Tsukuba, Japan, Nov. 2017.
163. **B. A. English,** A. Howard, "The Effects of Adjusting Task Difficulty on Learning Motor and Cognitive Aspects of a Multitasking Task," *IEEE Symposium Series on Computational Intelligence*, Honolulu, HI, Nov. 2017.
164. **B. Lee**, **J. Xu**, A. Howard, "Does Appearance Matter? Validating Engagement in Therapy Protocols with Socially Interactive Humanoid Robots," *IEEE Symposium Series on Computational Intelligence*, Honolulu, HI, Nov. 2017.
165. **J. Xu**, **D. Bryant**, Y.P. Chen, A. Howard, "Robot Therapist versus Human Therapist: Evaluating the Effect of Corrective Feedback on Human Motor Performance," *2018 International Symposium on Medical Robotics (ISMR)*, Atlanta, Georgia, March 2018.
166. **K. Fry**, Y.P. Chen, A. Howard, "Detection of Infant Motor Activity During Spontaneous Kicking Movements for Term and Preterm Infants Using Inertial Sensors," *Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'18)*, Honolulu, HI, July 2018.
167. **T. Ogunyale, D. Bryant**, A. Howard, "Does Removing Stereotype Priming Remove Bias? A Pilot Human-Robot Interaction Study," *5th Workshop on Fairness, Accountability, and Transparency in Machine Learning (FAT/ML 2018)*, Stockholm, Sweden, July 2018.
168. **J. Xu**, A. Howard, "The Impact of First Impressions on Human-Robot Trust During Problem-Solving Scenarios," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Nanjing, China, August, 2018.
169. **J. Xu**, **D. Bryant**, A. Howard, "Would You Trust a Robot Therapist? Validating the Equivalency of Trust in Human-Robot Healthcare Scenarios," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Nanjing, China, August 2018.
170. **J. Xu**, A. Howard, "Investigating the Relationship between Believability and Presence during Collaborative Cognitive Tasks with a Socially Interactive Robot," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Nanjing, China, August 2018.

171. **D. Das**, **K. Fry**, A. Howard, "Vision-Based Detection of Simultaneous Kicking for Identifying Movement Characteristics of Infants At-Risk for Neuro-Disorders," *2018 IEEE Machine Learning and Applications Conference* (IEEE ICMLA), Orlando, FL, December 2018.
172. **D. Bryant**, A. Howard, "A Comparative Analysis of Emotion-Detecting AI Systems with Respect to Algorithm Performance and Dataset Diversity," *AAAI/ACM Conference on AI, Ethics and Society*, Honolulu, HI, January 2019.
173. **R. Jamshad, K. Fry**, Y.P. Chen, **A. Howard**, "Design of a Robotic Crib Mobile to Support Studies in the Early Detection of Cerebral Palsy," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), New Delhi, India, October 2019.
174. S. Ye, G. Neville, **M. Schrum**, M. Gombolay, S. Chernova, A. Howard "Human Trust After Robot Mistakes: Study of the Effects of Different Forms of Robot Communication," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), New Delhi, India, October 2019.
175. **D. Bryant**, J. Bornstein, A. Howard, "Why Should We Gender? The Effect of Robot Gendering and Occupational Stereotypes on Human Trust and Perceived Competency," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Cambridge, UK, Virtual, March 2020.
176. **S. Bansal**, **J. Xu**, A. Howard, C. Isbell, "Planning for Human-Robot Parallel Play via Bayesian Nash Equilibrium Inference*," Robotics: Science and Systems 2020*, Virtual, July 2020.
177. **V. Emeli**, **K. Fry**, A. Howard, "Infant Kick Quality Detection to Support Physical Therapy and Early Detection of Cerebral Palsy: A Pilot Study," *IEEE Int. Symp. on Robot and Human Interactive Communication (RO-MAN)*, Virtual, Aug. 2020
178. **J. Xu**, A. Howard, "Would you Take Advice from a Robot? Developing a Framework for Inferring Human-Robot Trust in Time-Sensitive Scenarios," *IEEE Int. Symp. on Robot and Human Interactive Communication (RO-MAN)*, Virtual, Aug. 2020.
179. S. Ye, K. Feigh, A. Howard, "Learning in Motion: Dynamic Interactions for Increased Trust in Human-Robot Interaction Games," *IEEE Int. Symp. on Robot and Human Interactive Communication (RO-MAN)*, Virtual, Aug. 2020.
180. **V. Emeli**, **K. Fry**, A. Howard, "Robotic System to Motivate Spontaneous Infant Kicking for Studies in Early Detection of Cerebral Palsy: A Pilot Study," *IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob),* Virtual, Nov. 2020.
181. **V. Emeli**, **K. Fry**, A. Howard, "Towards Long-Term Learning to Motivate Spontaneous Infant Kicking for Studies in Early Detection of Cerebral Palsy using a Robotic System: A Preliminary Study*," IEEE International Conference on Systems, Man, and Cybernetics*, Virtual, Oct. 2020.
182. **J. Xu**, A. Howard, "How much do you Trust your Self-Driving Car? Exploring Human-Robot Trust in High-Risk Scenarios," *IEEE International Conference on Systems, Man, and Cybernetics*, Virtual, Oct. 2020.
183. **E. Kim, D. Bryant**, A. Howard, "Age Bias in Emotion Detection: Analysis of Facial Emotion Recognition Performance on Varying Age Groups," *AAAI/ACM Conference on AI, Ethics and Society*, Virtual, May 2021.
184. **V. Emeli**, A. Howard, "Towards Practical Deployment of a Robotic Mobile System for Early Detection of Cerebral Palsy in Infants," *IEEE Int. Conf. on Advanced Robotics and Its Social Impacts* (ARSO), Virtual, July 2021.
185. **K. Rogers**, A. Howard, "Intelligent Agent Deception and the Influence on Human Trust and Interaction," *IEEE Int. Conf. on Advanced Robotics and Its Social Impacts* (ARSO), Virtual, July 2021.
186. **D. Bryant**, **J. Xu**, **K. Rogers**, A. Howard, "The Effect of Conceptual Embodiment on Human-Robot Trust During a Youth Emotion Classification Task," *IEEE Int. Conf. on Advanced Robotics and Its Social Impacts* (ARSO), Virtual, July 2021 (*Best Paper Award*).
187. **K. Fry**, Y.P Chen, A. Howard, "Method for the Determination of Relative Joint Axes for Wearable Inertial Sensor Applications," *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Virtual, Sept. 2021.
188. **V. Emeli**, A. Howard, "Motivating Spontaneous Infant Kicking Motions through Long Term Learning Utilizing a Robotic Mobile System," *Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, Virtual, Oct. 2021.
189. **M. Halevy**, C. Harris, A. Bruckman, D. Yang, A. Howard, "Mitigating Racial Biases in Toxic Language Detection with an Equity-Based Ensemble Framework," *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (EAAMO '21), Virtual, Oct. 2021 (*Best Student Paper Award).*
190. **K. Fry**, Y.P Chen, A. Howard, "Validating a System to Monitor Motor Development of At-Risk Infants in Black Communities: A Case Study," *IEEE Signal Processing in Medicine and Biology Symposium*, Philadelphia, PA, December 2021.
191. **K. Rogers,** A. Howard, "When a Robot Tells You That It Can Lie," *IEEE Int. Conf. on Advanced Robotics and Its Social Impacts (ARSO)*, Long Beach, CA, May 2022.

192. C. Harris, **M. Halevy**, A. Howard, A. Bruckman, D. Yang, "Exploring the Role of Grammar and Word Choice in Bias Toward African American English (AAE) in Hate Speech Classification," *ACM Conference on Fairness, Accountability, and Transparency* (FAccT), South Korea, June 2022.
193. K. Rogers, A. Howard, "Exploring First Impressions of the Perceived Social Intelligence and Construal Level of Robots that Disclose their Ability to Deceive," *IEEE Int. Symp. on Robot and Human Interactive Communication (RO-MAN),* Napoli, Italy, Aug. 2022.
194. J. Xu, A. Howard, "Evaluating the Impact of Emotional Apology on Human-Robot Trust," *IEEE Int. Symp. on Robot and Human Interactive Communication (RO-MAN)*, Napoli, Italy, Aug. 2022.
195. "Doing Academia Differently: The Creation of a Cohort-Based Postdoctoral Scholars Program for Emerging Engineering Faculty," *ASEE Annual Conference & Exposition*, Baltimore, MD, June 2023.
196. **D. Bryant**, T. Etiene, A. Howard, W. Smart, D. F. Glas, "Teaching a Robot Where to Park: A Scalable Crowdsourcing Approach," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), Busan, Korea, Aug. 2023.

VI.B.3. Refereed Conference Short Papers, Late Breaking Reports and Posters

1. A. Howard, H. Seraji, B. Werger, "Fuzzy Terrain-Based Path Planning for Planetary Rovers," *9th International Symposium on Robotics and Applications*, Honolulu, HI, May 2002 (*Best Paper Award*).
2. E. Graham, A. Howard, "An Internship Model for Culturally Relevant Success for Native American High School Students," *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2004.
3. J. Walls, A. Howard, A. Homaifar, B. Kimiaghalam, "A Generalized Framework for Autonomous Formation Reconfiguration of Multiple Spacecrafts," *IEEE Aerospace Conference*, pgs. 397-406, Big Sky, Montana, March 2005.
4. A. Howard, E. Graham, "Crossing the technology gap between higher-learning and the classroom environment," *American Association for Higher Education National Conference*, Atlanta, March 2005.
5. R. Dorsey, A. Howard, "Examining the Effects of Technology-Based Learning on Children with Autism: A Case Study," *IEEE Intern. Conf. on Advanced Learning Technologies*, Athens, GA, July 2011.
6. **H.W. Park**, A. Howard, "Understanding child's play by sequencing play primitives and planning turn-taking strategy for a therapeutic robot playmate," *Pediatric Research Retreat: Frontiers in Pediatric Science*, Jan. 2012.
7. **D. Brooks**, A. Howard, "Quantifying physical therapy metrics through robotic assistance," *Pediatric Research Retreat: Frontiers in Pediatric Science*, January 2012.
8. A. Howard, **L. Roberts**, **S. Garcia**, R. Quarells, "Using Mixed Reality to Map Human Exercise Demonstrations to a Robot Exercise Coach," *Int. Symposium on Mixed and Augmented Reality*, Atlanta, GA, Nov. 2012.
9. **H. W. Park**, A. Howard, "Providing tablets as collaborative-task workspace for human-robot interaction," *8th ACM/IEEE International Conference on Human-Robot Interaction*, pgs: 207-208, Tokyo, Japan, March 2013.
10. Y-P Chen, S-Y Lee, A. Howard, "Effect of Virtual Reality on Upper Extremity Function in Children with Cerebral Palsy: A Meta-Analytic Review," *APTA Combined Sections Meeting 2014*, Nevada, February 2014.
11. **P. Robinette**, A. R. Wagner, and A. M. Howard, "Evaluating Social Responses of Humans to Evacuation Guidance Robots Using Web-Based Experiments," *Atlanta Workshop on Computational Social Science*, Atlanta, GA, 2013.
12. **S. García-Vergara**, A. Howard, "An Objective Measure of Upper Extremity Kinematics in Children during Rehabilitation Sessions," *Atlanta Chapter Society for Neuroscience*, November 2013.
13. J. MacCalla, A. Howard, "A Mobile Device to Enable Access to Pediatric Therapy Apps for School-Age Children with Upper-Body Motor Impairments," *Pediatric Research Conference*, Atlanta, GA, April 2014.
14. Y-P Chen, **S. Garcia-Vergara**, A. Howard, "Test-retest reliability and minimal detectable change in the Super Pop VR™ game: A reaching kinematics movement analysis game," *APTA Combined Sections Meeting 2015*, Indiana, February 2015.
15. R. Zhang, M. Jeon, C. H. Park, A. Howard, "Robotic Sonification for Promoting Emotional and Social Interactions of Children with ASD," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Portland, OR, March 2015.
16. Y-P Chen, **S. Garcia-Vergara**, A. Howard, "Effect of a home-based virtual reality intervention for children with cerebral palsy using SuperPop VR™ evaluation metrics – A feasibility study," *APTA NEXT Conference and Exposition*, National Harbor, MD, June 2015.
17. **B. Ge**, H.W. Park, A. Howard, "Learning Spatio-temporal Features of Prompting during Robot Intervention for Children with Autism," *IEEE Int. Conf. on Robotics and Automation (ICRA)*, Seattle, WA, May 2015.
18. H. J. Kim, T. Azad, C. H. Park, M. Jeon, and A. M. Howard, "Towards Physio-Musical Interactive Robotic Therapy for Children with Autism," *ICRA 2015 Workshop on Rehabilitation Robotics and Human-Robot Interaction*, Seattle, WA, May 2015.
19. E. Bermudez, M. Layman, E. Shepard, Y-P Chen, **S. Garcia-Vergara**, A. Howard, "Test-retest reliability and

minimal detectable change in the Super Pop VR™ game in healthy children," *APTA Combined Sections Meeting,* Anaheim, CA, February 2016.

20. C.H. Park, M. Jeon, A. Howard, "Interactive Robotic Framework for Multi-sensory Therapy for Children with Autism Spectrum Disorder," *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, New Zealand, March 2016.
21. E. Danish, S. Epling, N. Smelser, Y. Zhang, Y. Chen, S. Garcia-Vergara, A. Howard, B. Weissman, J. Hallman-Cooper, "Virtual Reality Gaming System can be Used in Home Based Treatment in Children with Cerebral Palsy: A Case Study." NEXT Conference, American Physical Therapy Association, Nashville, TN, June 2016.
22. R. Bevill, C.H. Park, A. Howard, M. Jeon, "Behavioral Analysis Automation for Music-Based Robotic Therapy for Children with Autism Spectrum Disorder," *IEEE Int. Symp. on Robot and Human Interactive Communication* (RO-MAN), New York, NY, August 2016.
23. **S. García-Vergara**, **P. Robinette**, Y-P Chen, and A. Howard, "Validation of a Physical Rehabilitation Game using Markerless versus Marker-Based Motion Capture Systems," *Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'16)*, Orlando, FL, August 2016.
24. **A. Coates**, A. Howard, "Employing Gestural Behaviors and Visual Cues on a Humanoid Robot to Increase Affect Recognition among Children with Autism," *Annual Int. Conf. of the IEEE Engineering in Medicine and Biology Society (EMBC'16)*, Orlando, FL, August 2016.
25. C. Beegle, A. Rollins, J. Tyra, Y-P Chen, **S. García-Vergara**, A. Howard, "Test-retest reliability and minimal detectable change in the Super Pop VR™ game: A reaching kinematics movement analysis game," *APTA Combined Sections Meeting 2017*, San Antonio, TX, February 2017.
26. Y. Chen, **S. Garcia-Vergara**, A. Howard, "Examining the Effect of Feedback from a Humanoid Robot on Reaching Kinematics in Children with Cerebral Palsy," *NEXT Conference*, American Physical Therapy Association, Boston, MA, June 2017, June 2017 (*Special Recognition Award*).
27. L Clackum, F. Fayyza, T. Gordon, K. Lansing, Y-P. Chen, **S. Garcia-Vergara**, A. Howard, B. Weissman, J. Hallman-Copper, "Effect of Rhythmic Auditory Stimulation in Virtual Reality Games to Improve Arm Function in Children with Cerebral Palsy: A Case Study," *NEXT Conference*, American Physical Therapy Association, Boston, MA, June 2017.
28. J. Borenstein, A. Wagner and A. Howard, "A Case Study in Caregiver Overtrust of Pediatric Healthcare Robots," *RSS Morality and Social Trust in Autonomy Workshop*, Boston, MA, July 2017.
29. L. Clackum, F. Fayyaz, T. Gordon, K. Lansing, Y.P. Chen, **S. Garcia-Vergara**, A. Howard, B. Weissman, J. Hallman-Cooper, "Effect of Functional Strength Training to Improve Arm Function in Children with Cerebral Palsy: A Case Study," *APTA Combined Sections Meeting,* New Orleans, LA, February 2018.
30. Y.P. Chen, **S. Garcia-Vergara**, A. Howard, "Evaluation of trials necessary to achieve performance stability in a reaching kinematics movement analysis game," *APTA Combined Sections Meeting,* New Orleans, LA, Feb. 2018.
31. **D. Bryant**, **J. Xu**, Y.P. Chen, A. Howard, "The Effect of Robot vs. Human Corrective Feedback on Children's Intrinsic Motivation," *ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019) - LBR,* Daegu, Korea, March 2019.
32. **M. Schrum,** C.H. Park, A. Howard, "Humanoid Therapy Robot for Encouraging Exercise in Dementia Patients," *ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019) - LBR,* Daegu, Korea, March 2019 (*Reviewer's Choice Award*).
33. **K. Rogers, D. Bryant**, A. Howard, "Robot Gendering: Influences on Trust, Occupational Competency, and Preference of Robot Over Human," *ACM CHI Conference on Human Factors in Computing Systems (CHI 2020) – LBR*, Virtual, April 2020.
34. M. Das, D. Marghitu, F. Jamshidi, A. Howard, M. Mandala, "Maximizing the Inclusiveness of Students with Disabilities in K 12 Formal and Informal STEM Education," *HCI International 2020*, Virtual, July 2020.
35. **K. Rogers**, A. Howard, "Looks Can Permit Deceiving: How Reward or Punishment Decisions are Influenced by Robot Embodiment," *ACM/IEEE International Conference on Human-Robot Interaction (HRI 2021) - LBR,* Virtual, March 2021.
36. **K. Rogers**, A. Howard, "Playing Dumb to Get Smart: Investigating the Influence of a Learner's Age on the Permissibility of Robot Deception in an Educational Scenario," AAMAS Workshop on Rebellion and Disobedience in AI (RaD-AI), Virtual, May 2022.
37. **S. Bansal**, **J. Xu**, A. Howard, C. Isbell, "Nash Equilibria in Bayes Games for Coordinating with Imperfect Humans," The Conference on Robot Learning (CoRL) Workshop, Auckland, NZ, December 2022.
38. **K. Rogers**, R. Webber, A. Howard, "Lying About Lying: Examining Trust Repair Strategies After Robot Deception in a High-Stakes HRI Scenario," *ACM/IEEE International Conference on Human-Robot Interaction (HRI 2023) - LBR,* Stockholm, Sweden, March 2023.
39. **K. Rogers** and A. Howard, "Tempering Transparency for Human-Robot Interaction," *IEEE International Symposium on Ethics in Engineering*, Science and Technology (IEEE-ETHICS), Indiana, May 2023 (*Best Poster Award*).

40. **K. Rogers** and A. Howard. "Robots that Deceive: A Counter-narrative to Transparency." J. ACM 37, 4, Article 111, 2023.

VI.C. Other Publications

VI.C.1. Blog Posts and Invited Papers

1. *Advanced Manufacturing Technology*, "Robotics Become Capable of Handling a Rubber Ball," by Ayanna Howard and George Bekey, Nov. 2000
2. *The Hechinger Report*, "Why there's no such thing as an 'F' in computer science," by Ayanna Howard and Alison Derbenwick Miller, https://hechingerreport.org/theres-no-thing-f-computer-science/, December 2014.
3. *Science*, "Building the Bionic Women," http://www.sciencemag.org/careers/2014/10/building-bionic-woman, October 2014.
4. *CIO Review*, "Big Data and Cloud Computing – The Next Step for Robot Intelligence," https://robotics.cioreview.com/cxoinsight/big-data-and-cloud-computing-the-next-step-for-robot-intelligence-nid-6018-cid-75.html, 2015.
5. *American Scientist*, "Trust and Bias in Robots," by Ayanna Howard and Jason Bornstein, https://www.americanscientist.org/article/trust-and-bias-in-robots, March-April 2019.
6. *NEXT Magazine*, "AI: The Fear, the Bias, and the Rewards," https://www.nutanix.com/go/next-magazine, May 2019.
7. *TechTalks*, "Artificial intelligence: Where's it going and where it's not," https://bdtechtalks.com/2019/07/10/ai-opportunities-challenges/, July 2019.
8. *MIT Sloan Management Review*, "The Regulation of AI — Should Organizations Be Worried?," https://sloanreview.mit.edu/article/the-regulation-of-ai-should-organizations-be-worried/, July 2019.
9. *MIT Sloan Management Review*, "Demystifying the Intelligence of AI," https://sloanreview.mit.edu/article/demystifying-the-intelligence-of-ai/, November 2019.
10. *MIT Sloan Management Review, "*AI, Robots, and Ethics in the Age of COVID-19*,"* by Ayanna Howard and Jason Bornstein, https://sloanreview.mit.edu/article/ai-robots-and-ethics-in-the-age-of-covid-19/, May 2020.
11. *MIT Sloan Management Review, "*Diversity in AI: The Invisible Men and Women*,"* by Ayanna Howard and Charles Isbell, https://sloanreview.mit.edu/article/diversity-in-ai-the-invisible-men-and-women/, Sept. 2020.
12. *Science Robotics*, "Robots are not immune to bias and injustice," by A. Howard and M. Kennedy III, Science Robotics 18 Nov 2020: Vol. 5, Issue 48, DOI: 10.1126/scirobotics.abf1364
13. *AI Ethics*, "Emerging challenges in AI and the need for AI ethics education," October 2020, https://doi.org/10.1007/s43681-020-00002-7
14. *Computer,* "AI Ethics: A Long History and a Recent Burst of Attention," by J. Borenstein, F. Grodzinsky, A. Howard, K. Miller and M. Wolf, vol. 54, no. 01, pp. 96-102, 2021.
15. *MIT Sloan Management Review*, "Taming AI's Can/Should Problem," co-written with D. Desai, https://sloanreview.mit.edu/article/taming-ais-can-should-problem/, May 2021.
16. *MIT Sloan Management Review,* "Real Talk: Intersectionality and AI," https://sloanreview.mit.edu/article/real-talk-intersectionality-and-ai/, August 2021.
17. Enginuity Podcast (Host), https://engineering.osu.edu/news/enginuity-podcast, (releases since Oct. 2021)
18. *MIT Sloan Management Review,* "Human Diversity Will Save Your Job From the Robot Takeover," https://sloanreview.mit.edu/article/human-diversity-will-save-your-job-from-the-robot-takeover/, January 2022.
19. *Issues in Science and Technology*, "A Moonshot for Every Kid," by Ayanna Howard, Charles Isbell, and Raheem Beyah, January 2022.
20. *MIT Sloan Management Review,* "Unleash the Superpowers of Your 'One and Only' Employees," https://sloanreview.mit.edu/article/unleash-the-superpowers-of-your-one-and-only-employees/, June 2022.
21. *The Columbus Dispatch*, "Why you should care about semiconductor industry. 5 things Ohio colleges must do," https://www.dispatch.com/story/opinion/columns/guest/2022/08/10/opinion-why-should-ohioans-care-semiconductor-industry-chip-act-ohio-state-columbus-intel/10200507002/, August 2022.

VI.D. Presentations

V.D.1 Invited Keynotes, Lectures, and Presentations

1. *Tutorial:* “Robotics in the 21st Century,” Society of Women Engineers Regional Conference, Santa Monica, CA, February 2000.
2. *Tutorial:* "Hybrid Systems: Effective ways to combine genetic algorithms, neural networks, and fuzzy systems for real-world applications,” World Automation Congress, Maui, HI, June 2000.
3. *Speaker:* “Robotics and Artificial Intelligence,” Santa Monica City College, March/Sept. 2000.
4. *Speaker:* “Robotics Research at JPL,” North Carolina A&T Computer Science Colloquium, Greensboro, NC, Sept. 2001.
5. *Speaker:* “Neural Networks, Robotics, Fuzzy Logic, Machine Vision, What’s It All About?” 2nd Annual Careers in Math, Science, and Technology Conference, Pasadena, CA, Jan 2003.
6. *Panelist:* “Women Working on Mars,” National Engineers Week WebCast, Pasadena, CA, Jan 2003.
7. *Panelist:* “Doing Business with Private and Governmental Space Agencies,” California Space Authority, San Luis Obispo, CA, Feb. 2003.
8. *Invited Keynote:* Tinker AFB: “The Souls of Black Folk (100th Anniversary),” Oklahoma, March 2003.
9. *Speaker:* “Robots in Space,” Astronomy Guest Lecture Series, Santa Monica College, CA, May 2003.
10. *Workshop:* “Going to Mars … JPL Style,” National Society of Black Engineers National Conference, Anaheim, CA, March 2003.
11. *Speaker:* “Autonomous Systems for Space Exploration,” Astronomy Colloquium, California State University, Los Angeles, CA, October 2003.
12. *Workshop:* “Space Explorers-Exploring the Universe,” Young African American Women’s Conf., Nov. 2003.
13. *Invited Speaker*: “Smart Robots for Space Exploration,” Pacific Science Center Space Lecture Series, Seattle, Dec. 2003.
14. *Invited Speaker*: “Robots for Space Exploration,” Chabot Science Center Distinguished Lecture Series, Oakland, CA, Feb. 2004.
15. *Speaker:* “Artificial Intelligence for Space Robotics: How Smart is Smart?” University of Southern California, March 2004.
16. *Speaker:* “Artificial Intelligence for Autonomous Control in Space,” von Karmen Lecture Series, Pasadena, CA, April 2004.
17. *Speaker:* “Human-Inspired Techniques for Exploring Space,” Mt. Wilson Observatory Lecture Series, CA, April 2004.
18. *Invited Speaker*: “Research in Behavior-Based Navigation Strategies for Planetary Robots,” Robotics, Controls, and Mechatronics Colloquium, University of Washington, May 2004.
19. *Panelist*: “The Supersmart Robots are Coming,” Technology Summit for Business Solutions, Los Angeles, CA, June 2004.
20. *Invited Panelist*: “Innovation and Transformation: Big New Ideas,” ideaFestival, Lexington, KY, Sept. 2004.
21. *Invited Keynote:* Lexmark Corp: “From the Spacecraft to the Desktop - Technological Advances in Everyday Life,” Kentucky, Sept. 2004.
22. *Invited Keynote:* UC San Diego: “Preparing for the Excitement in Engineering,” California, Oct. 2004.
23. *Panelist:* “Life after High School Panel,” Governor’s Conference on Women and Families, CA, Dec. 2004.
24. *Invited Speaker*: “Applying Human-Based Intelligence Techniques to Space Robotics,” Rowan University, Dec. 2004.
25. *Invited Speaker*: “Robot Learning: Human-Inspired Techniques for Space and Field Robotics,” Annual National Academy of Engineering Meeting, April 2006.
26. *Speaker:* “Human-Inspired Techniques for Robotic Control,” Neuromorphic Engineering Workshop, Telluride, CO, July 2006.
27. *Invited Speaker*: “Human-Inspired Techniques: Smart Robots for Space Exploration,” Buena Vista University, Storm Lake, IA, Nov. 2006.
28. *Invited Speaker:* “Robot Learning: Humanized Intelligence for Space and Field Robotics,” NAE German-American Frontiers of Engineering Conference, Hamburg, Germany, April 2007.
29. *Speaker:* “Career Choice – Research in Space Robotics,” California Institute of Technology Targeted Minority Student Education Speaker Series, Nov. 2007.
30. *Invited Speaker:* “The Design of Robotics and Their Societal Usefulness,” CUSP Conference, Chicago, Illinois, September 2008.
31. *Invited Keynote:* “Traversing Through the Robotics World of Research,” Louis Stokes Alliance for Minority Participation Research Symposium, Roanoke, WV, April 2009.
32. *Speaker:* “Intelligent robotics for assistive healthcare and therapy,” Morehouse MBRS Lecture Series, Atlanta, GA, Oct. 2009.
33. *Invited Keynote:* “Lessons Learned Traversing Through the Robotics World of Research,” HBCU-UP National Research Conference, Atlanta, GA, Oct 2009.
34. *Invited Speaker*: “Robots and Climate Change: Using a Science Network of Mobility Operators that Explore in

Snow (SnoMotes)", University of Seville, Seville, Spain, Nov. 2009.
35. *Invited Panel Speaker*: "Work-Life Flexibility for Faculty," University of Washington, On-Ramps into Academia Workshop, Seattle, WA, Oct. 2009.
36. Gilbreth Lectureship: "Robot Learning: Humanized Intelligence for Space and Field Robotics," National Academy of Engineering's National Meeting, Washington, DC, Feb 2010.
37. *Invited Keynote:* "SnoMotes - Robotic Scientific Explorers for Understanding Climate Change," Carolinas Women in Computing Conference (CRA-W/CDC Distinguished Lecturer), Columbia, SC, Nov. 2010.
38. Virtual Scientist Series: "SnoMotes" Boston Public High School (Match, English, John O'Bryant), May 2010.
39. *Invited Speaker*: "Sciencemakers - Dinosaurs Unearthed," Detroit Science Museum, Detroit, MI, Feb. 2011.
40. *Invited Panel Speaker*: "Navigating the Tenure and Promotion Process," NSF Academic Career Mentoring Workshop, Los Angeles, CA, Feb. 2011.
41. *Invited Keynote:* "Robotic Scientific Explorers for Understanding Climate Change," Tapia Celebration of Diversity in Computing Conference, April 2011.
42. *Invited Panel Speaker*: "Building Your Teaching Program," University of Washington, On-Ramps into Academia Workshop, Seattle, WA, May 2011.
43. *Invited Speaker*: "Robotic Scientific Explorers for Understanding Climate Change," National Security Agency (NSA), Fort Meade, MD, Oct. 2011.
44. *Invited Speaker*: "Atlanta: Connections in Science," Fernbank Science Center, Atlanta, GA, Feb. 2012.
45. *Invited Speaker*: "Roving the Icy Planet: Robotic Explorers for Understanding Climate Change," JHU Applied Physics Laboratory, Laurel, MD, Feb. 2012.
46. *Panel Speaker*: "Launching a Research Program," NSF Academic Career Mentoring Workshop, Atlanta, GA, March 2012.
47. *Invited Speaker*: "Roving the Icy Planet: Robotic Explorers for Understanding Climate Change," John Hopkins University, Baltimore, MD, April 2012.
48. *Invited Keynote:* "Intelligent Robotics for Assistive Healthcare and Therapy," IEEE Atlanta Section Regional Conference, Atlanta, GA, April 2012.
49. *Seminar Lecture*: "Assistive Robotics for Health and Education," Morehouse College Pre-Freshmen Summer Science Program, Atlanta, GA, June 2012.
50. *Speaker:* "Music-Induced Interventions for Children with Cerebral Palsy," Grammy Foundation - Atlanta Board Meeting, Atlanta, GA., September 2012.
51. *Invited Panel Speaker*: "Work-Life Balance for Faculty," University of Washington, On-Ramps into Academia Workshop, Seattle, WA, Oct. 2012.
52. *Invited Keynote*: "Pediatric Robotics@Home, Work, Play," Peach State LSAMP - 7th Annual Fall National Symposium and Research Conference, Athens, GA, Oct. 2012.
53. *Invited Speaker*: "Making Robots Smart(er)," TedTalk – TedYouth Day, New York, NY, Nov. 2012.
54. *Invited Speaker*: "Intelligent robotics for healthcare applications," University of Arkansas-Little Rock Fall Colloquium, Little Rock, AK, Nov. 2012.
55. *Invited Keynote:* "Pediatric Robotics@Home, Work, Play," MESA Conference, Georgia Perimeter College, Atlanta, Feb. 2013.
56. *Invited Speaker*: "Multi-Modal Communication Schemes for Human-Robot Interaction," National Security Agency (NSA), Fort Meade, MD, March 2013.
57. *Traveling Speaker – U.S. Embassy Speaker and Specialist Program*: "Women in STEM, IT, and High Technology," U.S. Embassy, Tel Aviv, Israel, April 19-24, 2013.
58. *Invited Speaker*: "Robots in Play: Human-Robot Interaction Schemes for Pediatric Therapy," CMU Robotics Institute Seminar Series, Pittsburgh, PA, April 2013.
59. *Invited Speaker*: "Robots in Play: Human-Robot Interaction Schemes for Pediatric Therapy," Marquette University, Milwaukee, WI, April 2013.
60. *Invited Keynote:* "Robotics and Assistive Technologies: Their Emerging Role in Healthcare," 26th International FLAIRS Conference, St. Pete Beach, FL, May 2013.
61. *Invited Panel Speaker*: "Creating Robotic Systems That Assist Humanity," SACNAS Annual Conference, San Antonio, TX, October 2013.
62. *Invited Panel Speaker*: "Building Your Professional Persona," 2014 CRA-W Graduate Cohort Program, Santa Clara, CA, April 2014.
63. *Invited Speaker*: "Robotics and Assistive Technologies: Their Emerging Role in Healthcare," Florida State University, Tallahassee, FL, April 2014.
64. *Invited Speaker*: "Robotics and Assistive Technologies: Their Emerging Role in Healthcare," (IGERT) Seminar Series, University of Pittsburgh, Pittsburgh, PA, April 2014.
65. *Invited Session Speaker:* FiRST (Frontiers in Rehabilitation Science and Technology) : Bioengineering, American Physical Therapy Association Next Conference, Charlotte, NC, June 2014.

66. *Traveling Speaker – U.S. Embassy Speaker and Specialist Program:* "Robotics – Opportunities in the 21 century economy," U.S. Embassy, India (Mumbai, Hyderabad, Chennai), August 31-Sept. 4th, 2013.
67. *Invited Technology Demonstrator:* Workshop on virtual reality, video games, and physical disabilities, Annual Meeting - American Academy for Cerebral Palsy and Developmental Medicine, San Diego, CA, Sept. 2014.
68. *Invited Session Keynote*: "Robots and Gaming – Therapy for Children with Disabilities," IROS, Chicago, IL, Sept. 2014.
69. *Speaker*: "Breaking the Glass Ceiling: Lessons Learned Traversing Through the Robotics World," IEEE RAS Women in Engineering Leadership Luncheon, Chicago, IL, Sept. 2014.
70. *Speaker*: "Real-Life Challenges for the Deployment of Healthcare Robotics," IROS Workshop: Assistive Robotics for Individuals with Disabilities: HRI Issues and Beyond, Chicago, IL, Sept. 2014.
71. *Speaker*: "Research from the Academic Lab to Startup: The Growth Pains of Tech Transfer," IROS Industry Forum: Perspectives on Entrepreneurship in Robotics and Automation, Chicago, IL, Sept. 2014.
72. *Invited Speaker*: "Robotics and Assistive Technologies: Their Emerging Role in Healthcare," Brown University, Providence, RI, November 2014.
73. *Invited Speaker*: "Robotics and Assistive Technologies: Their Emerging Role in Healthcare," Tufts University, Medford, MA, November 2014.
74. *Invited Speaker*: "Robot-Assisted Therapy for Children with Cerebral Palsy," Texas A&M Robotics Symposium, College Station, TX, January 2015.
75. *Invited Speaker*: "Robot-Assisted Therapy for Children with Physical Disabilities," University of Pennsylvania GRASP Seminar, Philadelphia, PA, February 2015.
76. *Invite Speaker*: "Robots – Their Role in Healthcare," Seminar: Robot Invasion: Are Smart Products Running Your Life?, Cooper Hewitt, Smithsonian Design Museum, New York, NY, February 2015.
77. *Invited Keynote*: "Designing Robots for Real People," HybridConf, Dublin, Ireland, August 2015.
78. *Panel Speaker*: "Undergraduate research: Making the most of a summer experience," 2015 Southeast Women in Computing Conference, October 2015
79. *Speaker*: "The Problem with the Economy is that it Doesn't Need You Anymore," Platform Summit 2015, Atlanta, GA., October 2015.
80. *Invited Keynote:* "Breaking the Glass Ceiling: Lessons Learned Traversing Through the Robotics World," Southeast Women in Computing Conference, Atlanta, GA, November 2015.
81. *Invited Keynote:* "Socially Assistive Robotics for Pediatric Therapy," IEEE Conference on Research on Equity and Sustained Participation in Engineering, Computing, and Technology, Atlanta, GA, August 2016.
82. *Invited Speaker:* "Robots: The Mind in The Machine," City Arts & Lectures, San Francisco, CA, Feb. 2016.
83. *Invited Speaker:* "The Role of Robotics for Engaging Children with Special Needs in Therapy," University of Delaware, Newark, DE, March 2016.
84. *Invited Panel Speaker:* "What Can Every Entrepreneur Learn from Robots?" IEEE Global Entrepreneurship Summit (IEEE N3XT), Austin, TX, September 2016.
85. *Panel Speaker:* "Recent Winners – If I Only Knew Then, What I Know Now," Small Business Innovation Research (SBIR) New England Regional Summit, Boston, MA, October 2016.
86. *Invited Keynote*: "Robotics and Artificial Intelligence," Technical College System of Georgia Annual Leadership Conference, Savannah, GA, October 2016.
87. *Invited Panel Speaker:* "Furthering the Role of Women as Leaders in High Tech Small Businesses," 2016 SBIR New England Regional Summit @ MIT, Boston, MA, October 2016.
88. *Invited Panel Speaker:* "The Implications of AI," Chicago Ideas Festival, Chicago, IL, Oct. 2016.
89. *Panel Speaker:* "Paths and Strategies to Successful and Fulfilling Careers in Academia," IEEE-WIE Leadership Summit Women, Atlanta, GA, November 2016.
90. *Invited Keynote*: "The Future of Robotics and Intelligent Machines", California Educational Technology Professionals Association Annual Conference, Sacramento, CA, November 2016.
91. *Invited Panel Speaker*: "Ensuring your Visibility", CRA-W Career Mentoring Workshop, Washington, D.C., November 2016.
92. *Invited Speaker*: "Bridging your interests: Combining Skills and Passion to Enable Innovation," Women Empowered in Science, Technology, Engineering, and Mathematics Conf., Urbana-Champaign, IL, Jan. 2017.
93. *Invited Keynote*: "Designing Assistive Robots and Technologies for Pediatric Care," AAAI Symposium on Educational Advances in Artificial Intelligence, San Francisco, CA, Feb. 2017.
94. *Invited Speaker*: "Socially Interactive Robots for Pediatric Therapy," College of Computer and Information Science Talk - Northeastern University, Boston, MA, February 2017.
95. *Invited Panel Speaker*: "Personal Technologies for Aging," TechSAge State of the Science Conference, Atlanta, GA, March 2017.
96. *Invited Speaker*: "Robots – Improving our Future or Leading us to Doom," Presidential Colloquium Series - Brown University, Providence, RI, March 2017.

97. *Invited Speaker*: "Socially Interactive Robots for Pediatric Therapy," George Washington University BME Distinguished Lecture Series, Washington DC, April 2017.
98. *Invited Speaker*: "Designing Robots for the Inevitable Future," Le Moyne College, Syracuse, NY, April 2017.
99. *Invited Workshop*: "AI and Its Social Impact," Bloomberg Breakaway Summit, New York, NY, May, 2017.
100. *Invited Keynote*: "Research at the Intersection Between Robots and Play: Designing Robots for Children's Healthcare," *IEEE Int. Conf. on Robotics and Automation*, Singapore, May 2017
101. *Invited Speaker*: "The Engineers: Rise of the Robots," Science Museum in London, London, June 2017.
102. *Invited Panel Speaker,* "Fairness, accountability and transparency in algorithmic decision making," ACM Richard Tapia Celebration of Diversity in Computing, Atlanta, GA, October 2017.
103. *Invited Speaker*: "Designing Robots for the Future - A Journey from Innovation to Entrepreneurship," Chambers Family Entrepreneurial Lectureship - Vanderbilt University, Nashville, TN, September 2017.
104. *Invited Keynote*: "The Value of You (U) in Computing: A Robot Story," *Grace Hopper Celebration of Women in Computing*, Orlando, FL, October 2017.
105. *Invited Speaker*: "Engaging Children in STEM Education Through Interactive Robots, Tangibles, and Games," *Learning and the Brain Conference*, Boston, MA, November 2017.
106. *Invited Panel Speaker*: "Distinguished Scholars Panel," American Congress of Rehabilitation Medicine Conference – Early Career Development Course, October 2017.
107. *Invited Speaker, "*Research at the Intersection Between Robots and Play: Designing Robots for Children's Healthcare," Oregon State University, Corvallis, OR, November 2017.
108. *Invited Keynote*: "An Investigative Report: Examining Trust in Human-Robot Interaction Scenarios," *International Symposium on Multi-robot and Multi-Agent Systems*, Los Angeles, CA, December 2017.
109. *Invited Speaker*: "Pediatric Robotics: A Journey from Lab Innovations to Social Impact," Carnegie Capital Science Evening Lecture, Washington D.C., December 2017.
110. *Invited Keynote*: "The Value of Inclusive STEM Education: Robots and their Role in our Future", The National Future of Education Technology Conference (FETC), Orlando, FL, January 2018.
111. *Invited Speaker*: "Robots and Play: Designing Robots for Pediatric Healthcare.," Clemson University, Clemson, SC, February 2018.
112. *Panelist*: "Hacking the Racial Bias in Artificial Intelligence," South by Southwest (SxSW), Austin, TX, March 2018.
113. *Panelist*: "Founders Get Real," YURHOUSE@South by Southwest (SxSW), Austin, TX, March 2018.
114. *Invited Speaker:* "Pediatric Robotics – A Journey from the Lab to a Child's Home," Cray Distinguished Speaker - University of Minnesota, Minneapolis, MN, April 2018.
115. *Invited Speaker*: "HCI & Robotics," blackcomputeHER, Atlanta, GA, April 2018.
116. *Invited Speaker*: "Should We Trust Robots and Should They Trust Us? Overtrust and Bias in the Modern Age," Maurice and Yetta Glicksman Forum - Brown University, Providence, RI, May 2018.
117. *Invited Panel Speaker*: "Can't We All Just Get Along?" TechCrunch Robotics, San Francisco, CA, May 2018.
118. *Speaker*: "Trust and Bias – Why should roboticists care?" ICRA 2018 Ethics Forum, Brisbane, Australia, May 2018.
119. *Invited Speaker*: "Strategies for Developed Ethical AI," Consortium for Socially Relevant Philosophy of/in Science and Engineering Conference, Atlanta, GA, June 2018.
120. *Invited Speaker and Compère*: "Where Does the Social Responsibility lie in Human-Robot Interaction?" Deep Learning for Robotics Summit, San Francisco, CA, June 2018.
121. *Invited Panelist*: "Plenary Panel: Diversity in Leadership," CRA Conference at Snowbird, Snowbird, UT, July 2018.
122. *U.S. Embassy Speaker and Specialist Program*: "Women in Tech," U.S. Embassy, Cambodia and The Philippines, August 31-Sept. 8, 2018.
123. *Invited Speaker*: "Should we trust robots and should they trust us?" TED^{x}Bermuda, Bermuda, September 2018.
124. *Invited Inaugural Speaker*: "The Impact of Robotics in Pediatric Health Care," University of Kansas IHAWKe engineering lecture series, October 2018.
125. *Invited Panelist*: "Generation Robot: What Does the Pervasive Growth of Robots in Society Mean for the Electronic Component Industry?" ECIA Executive Conference, October 2018.
126. *Invited Speaker*: "Robots and Bias," TEDWomen, https://www.ted.com/talks/ayanna_howard_tedwomen_ 2018, Palm Spring, CA, November 2018.
127. *Invited Talk*: "Investigations into the Human-AI Trust Phenomenon," NeurIPS, Montreal, QC, Dec. 2018.
128. *Invited Keynote:* "The Human-Centered Design of Robotics for Social Impact," Art Machines: International Symposium on Computational Media Art, Hong Kong, January 2019.
129. *Invited Keynote:* "Lessons Learned Traversing Through the Robotics World of Research*,"* NSF EFRI REM (Research Experience and Mentoring) Program, Washington, DC, March 2019.
130. *Invited Talk:* "Are We Trusting our Robots Too Much? Examining Human-Robot Interactions in the Real

World," UCLA EE Speaker Seminar Series, May 2019.

131. *Invited Talk:* "Roving for a Better World," Apple World Wide Developer Conference (WWDC 2019), San Jose, CA, June 2019.
132. *Invited Talk*: "Human-AI Collaboration for Decision-Making," Microsoft Research Faculty Summit, Seattle, WA, July 2019.
133. U.S. Embassy Speaker and Specialist Program: "MoonShot Morocco," U.S. Embassy, Morocco, July 2019.
134. *Invited Talk*: "Roving for a Better World," Harvard CS Colloquium, September 2019.
135. *Invited Talk:* "AI and The Future of Work – Making Us and AI Smarter Together," AnitaB.org Technical Executive Forum (TEF), September 2019.
136. U.S. Embassy Speaker and Specialist Program, U.S. Embassy - Brunei/Singapore, Oct. 2019.
137. *Invited Keynote*: "Designing Socially Interactive Agents for Healthcare," BayLearn Conference, Oct. 2019
138. *Invited Talk*: "Roving for a Better World," UW Allen School Distinguished Lecture, Seattle, December 2019.
139. *Invited Keynote: "*Hacking the Human Bias in AI," ACM FAT*, Barcelona, Spain, January 2020.
140. *Invited Plenary Panelist*: "COVID-19: How Roboticists Can Help," ICRA 2020 Plenary Panel, May 2020.
141. *Invited Panelist*: "How Artificial Intelligence and big data are playing a critical role in combating COVID-19," United Nations – Habitat Webinar, June 2020.
142. *Invited Panelist*: "The Ethical Questions Raised by the Rise of AI," Reimagine the Future of Artificial Intelligence Virtual Summit, June 2020.
143. *Invited Keynote*: "Designing Socially Interactive Robots for Early Intervention," Cerebral Palsy Foundation/New Frontiers 2020 e-Health Summit, Aug. 2020.
144. *Invited Talk:* "How Could a Robot be Racist? Evaluating Bias in Artificial Intelligence," University of Cambridge Trust & Technology Initiative, Nov. 2020.
145. *Invited Panelist:* "Three Contemporary Black Women Inventors", United States Patent and Trademark Office (USPTO), February 2021.
146. *Invited Topical Lecture,* "Demystifying AI Through the Lens of Fairness and Bias," AAAS Annual Meeting, February 2021.
147. *Invited Fireside Chat,* "Fireside Chat with Ayanna Howard," Black in AI Social at AAAI-21, February 2021.
148. *Invited Talk*: "Understanding and Mitigating Bias and Human Overtrust in Robotics and AI," Human-Computer Interaction Institute Seminar, Carnegie Mellon University, March 2021.
149. *Invited Panelist,* "The Future is Intersectional: Black Women Interrogating Technology Series," MozFest 2021, March 2021.
150. *Invited Panelist:* "Fostering Diversity: Lessons from Recent Events and Making Change Happen," Northwestern University Engineering, May 2021.
151. *Keynote:* "How Could a Robot be Sexist? Evaluating Bias in Artificial Intelligence," Robotics Science and Systems (RSS) Conference, July 2021.
152. *Distinguished Lecture:* "Making the World Better through Robotics and AI," Barnard Distinguished Lecture in Computer Science, New York, Sept. 2021.
153. *Distinguished Lecture*, "Socially Interactive Robots for Equitable Healthcare Outcomes," NSF Directorate for Engineering, Virtual, May 2022.
154. *Plenary Speaker,* "Robots, Ethics, and Society: Mitigating the Bias in Emerging Technologies," International Conference on Robotics and Automation (ICRA), Philadelphia, May 2022.
155. *Plenary Speaker*, "The Trusting of Cyber-Physical Systems: How AI Influences Human Behavior," American Control Conference (ACC), Atlanta, GA, June 2022.
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8. A. Howard, **H.W. Park**, "Using Tablets and Robots to Engage Children with Disabilities in STEM," 31st Annual Closing The Gap Conference, Minneapolis, MN, October 2013.
9. D. Marghitu, T. Mitrano, A. Howard, "Bringing Accessibility into the Classroom: Practice and Proof," EDUCAUSE 2013 Annual Conference, Anaheim, CA, October 2013.
10. A. Howard, **S. García-Vergara**, **L. Brown**, **H.W. Park**, "Engaging Children in Rehabilitation through Virtual Reality Robot-Assisted Therapy Approaches," IROS 2013 Workshop on Healthcare Robotics and Wearable Systems, November 2013.
11. A. Howard, **H.W. Park**, "Using Tablet Devices to Engage Children with Disabilities in Robotic Educational Activities," 29th Annual International Technology and Persons with Disabilities Conference, San Diego, CA, March 2014.
12. **R. Coogle**, A. Howard, "A Multiagent Robotic System for In-Situ Modeling and Observation of Icebergs", American Geophysical Union's 46th annual Fall Meeting, San Francisco, CA, December 2013.

VII. SERVICE

VII.A. PROFESSIONAL CONTRIBUTIONS

VII.A.1. Membership on Editorial Boards
1. Associate Editor, *Int. Journal of Intelligent Automation and Soft Computing*, 2000-2014
2. Associate Editor, IEEE Robotics and Automation Conference Editorial Board, 2006-2013
3. Associate Editor, *IEEE Transactions on Systems, Man, and Cybernetics*, 2010-2016
4. Associate Editor, *IEEE Transactions on Robotics*, 2016-2019
5. Editor-in-Chief, IEEE Robotics and Automation Conference Editorial Board, 2018-2021
6. Editor, *Science Robotics*, 2021-present

VII.A.2. Ethics and Responsible Research Service
1. Scientist Member, Georgia Tech Central Institutional Review Board, 2017 - 2021
2. AAAI Ethics Committee (Chair), 2018 – 2021
3. IEEE ICRA SPC Plagiarism Committee (Chair), 2019 – 2021
4. IEEE IROS SPC Plagiarism Committee, 2020
5. GT Research Misconduct Investigation Committee, 2020
6. Organizing Committee, Symposium on Ethical Management of AI: A French/US Approach, 2020
7. Expert Discussant, U.S. Comptroller General Forum on AI Oversight, Sept. 2020
8. Co-Lead and Co-Founder, Ethics, Technology & Human Interaction Center for Society and Social Change ($ETHICS^2$), 2020 – 2021
9. International Conference on Learning Representations (ICLR) Ethics Review Committee, 2021, 2022
10. National Academy of Engineering (NAE) Study Committee - Responsible Computing Research: Ethics and Governance of Computing Research and its Applications, 2021 – 2022
11. One Hundred Year Study on Artificial Intelligence (AI100) Standing Committee, 2021 - 2024

VII. A.3. Co-Chairs/Chairs and Program Committees
1. Co-Chair, AAAI Symposium on Accessible Hands-on AI and Robotics Education Workshop, 2004
2. Tutorial Chair, Program Committee Member, IEEE Int. Conference on Systems, Man and Cybernetics, 2005
3. Program Committee, International Conference on Advanced Robotics (ICAR), 2005, 2007, 2009
4. Program Committee, IEEE/RSJ International Conference on Intelligent Robots, 2005, 2006
5. Program Committee, FLAIRS AI Education, 2006, 2007
6. Poster Program Committee, IEEE Int. Conference on Robotics and Automation, 2006

7. Program Committee, Int. Joint Conf. on Artificial Intelligence (IJCAI), 2007
8. Program Committee, IEEE Conference on System of Systems Engineering, 2007
9. Co-Chair, IEEE ICRA Workshop on Robotics in Challenging and Hazardous Environments, 2007
10. Program Committee, Int. Conf. on Robot Communication and Coordination, 2007, 2009
11. Organizing Committee, BIRS Workshop on Mentoring for Engineering Academia, 2006-2007
12. Finance Chair, 2008 IEEE International Conference on Robotics and Automation, 2006-2008
13. Local Organizing Chair, 2009 International Joint Conference on Neural Networks, 2008-2009
14. Program Committee, International School in Robotics and Intelligent Systems, 2009
15. Space Exploration Track Chair, 2010 Aerospace Systems Conference, 2008-2010
16. Program Committee, Robotics: Science and Systems Conference (RSS), 2009, 2017
17. Chair, HRI ICRA Robot Challenge, 2009
18. Local Organizing Chair, 2011 IEEE Int. Symp. on Robot and Human Interactive Communication, 2009-2011
19. Program Committee, Int. Symposium on Distributed Autonomous Robotic Systems, 2010, 2014
20. Program Committee, IEEE Int. Conference on Systems, Man and Cybernetics, 2006-07, 2013-14, 2016, 2017
21. Human-Machine Systems Program Co-Chair, IEEE Int. Conference on Systems, Man and Cybernetics, 2011
22. Program Committee, IEEE Biosignals and Biorobotics conference, 2014
23. Co-Chair, AAAI-13 and AAAI-14 Doctoral Consortium, 2013 – 2014
24. Program Committee, IEEE Int. Symp. on Safety, Security, and Rescue Robotics, 2012, 2013, 2015
25. Chair, 2014 ICRA Ph.D. Forum, 2014
26. Co-Chair, CRA-W Grad Cohort Workshop, 2014 – 2018
27. Program Committee, AAAI Doctoral Consortium, 2015, 2016
28. Program Co-Chair, International Conference on Social Robotics, 2016
29. Program Committee, IEEE Symp. on Computational Intelligence in Robotic Rehabilitation and Assistive Technologies, 2016
30. Program Committee, Robotics: Science and Systems Conference Workshops, 2016
31. Program Committee, IEEE Symposium Series on Computational Intelligence, 2016
32. Scientific Committee of the Science and Research Track, Annual International Technology and Persons with Disabilities Conference, 2017
33. Program Chair, IEEE Workshop on Advanced Robotics and its Social Impacts, 2017
34. Program Committee, IEEE Int. Symposium on Robot and Human Interactive Communication, 2016
35. Program Committee, HRI Pioneers Workshop, 2017
36. Poster Committee Member, Richard Tapia Celebration of Diversity in Computing Conference. 2017
37. Editor/Program Committee, IEEE Int. Symposium on Robot and Human Interactive Communication, 2017
38. Workshop Co-organizer, RSS Perception and Interaction Dynamics in Child-robot Interaction Workshop, 2017
39. Publicity Chair (US), ACM/IEEE International Conference on Human Robot Interaction (HRI), 2018
40. Tutorial and Workshop Co-Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2019
41. Co-Chair, Computing Research Association (CRA) Grad Cohort Workshop for Inclusion, Diversity, Equity, Accessibility, and Leadership Skills (IDEALS), 2017 – present
42. Program Committee Member, AI for Multimodal Human Robot Interaction Workshop, 2018
43. Chair, Nomination Committee of the IEEE RAS Early Career Award, 2018
44. Chair, I.AM.GradComputing Workshop for Undergraduate Women in Computing, 2018 – 2020

VII.A.4. Review Panels

1. Reviewer, NASA NRA Cross Enterprise Technology Development Program (CETDP), 2000
2. NASA Faculty Awards for Research (FAR) Program, 2002
3. Reviewer, Louisiana Board of Regents R&D Grants Program, 2002, 2003, 2010, 2011
4. NSF Review Panels, 2004-2017
5. Reviewer, NASA Idaho EPSCoR Program, 2007
6. NSERC College of Reviewers, Canada Research Chairs Program, 2007, 2012
7. Reviewer, Health Systems Institute Seed Grant Program, 2007-2009
8. Grace Hopper Celebration of Women in Computing Scholarship Reviewer, 2007, 2008
9. Peer Reviewer, British Columbia Innovation Council, 2009
10. Reviewer, AAAS Research Competitiveness Program, 2009
11. National Research Council Study on NASA's Planetary Science Decadal, 2009-2010
12. Robotics: Science and Systems 2010 Workshop Evaluation Committee, 2010, 2012
13. U.S. Army Corps of Engineers' Engineer Research and Development Center peer reviewer, 2011
14. Peer Reviewer, Cognitive Sciences Call 2011 of the Vienna Science and Technology Fund, 2011
15. Reviewer, AAMAS-13 Doctoral Consortium, 2013

16. Reviewer, HIP-ACTSI Healthcare Innovation Program, 2012-2015
17. Reviewer, NASA Space Technology Research Fellowship (NSTRF), 2014
18. Committee Member, A Richard Newton ABIE Award Selection Committee, 2016, 2017
19. Committee Member, Anita Borg Institute A. Richard Newton Educator Award Selection Committee, 2016
20. Computing Innovation Fellows Reviewer, 2020
21. ACM/AAAI Allen Newell Award committee, 2020-2022

VII.A.5. Membership in Professional Organizations

1. IEEE Fellow/IEEE Senior Member, IEEE Robotics and Automation Society, 1999-present
2. Lifetime Member, Delta Sigma Theta Sorority, Inc., 2000-present
3. AAAI Fellow/Member, American Association of Artificial Intelligence, 2002-2013, 2016-present
3. Senior Member, Society of Women Engineers, 2001-2005
4. Member, Georgia Electronic Design Center, 2005-present
5. Alumni Member, National Society of Black Engineers (NSBE), 2007-2014
6. Member, American Society for Engineering Education, 2011-present
7. Member, Rehabilitation Engineering and Assistive Technology Society, 2013-present
8. Member, Association for Computing Machinery (ACM), 2016-present
9. AAAS Fellow/Member, American Association for the Advancement of Science (AAAS), 2017-present

VII.B. CAMPUS CONTRIBUTIONS

VII.B.1. NASA JPL

1. Council Member, JPL Director's Advisory Council for Women, 1999-2001
2. Technical Reviewer, JPL Director's Research and Development Fund, 2003, 2004
3. Reviewer, NASA Small Business Innovative Research Proposals, 2002-2004
4. Proposal Reviewer, NASA Graduate Student Research Program, 2004
5. Board Member, JPL Minority Education Initiatives Advisory Board, 2002-2005
6. Technical Recruiter, Jet Propulsion Laboratory, 1999-2005
7. JPL National Society of Black Engineers (NSBE) Convention Planning Team, 2003-2004
8. Speakers Bureau, Jet Propulsion Laboratory, 1998-2005

VII.B.2. University/College of Engineering, Georgia Institute of Technology

12. Speaker, GT Mars Society, 2006
13. Speaker, GT AASU Success Panel, 2006
14. Speaker, GT Women's Resource Center Summer Speaker Series, 2006
15. Instructor, COE Technology, Engineering and Computing Camp, 2007
16. Keynote Speaker, Introduce a Girl to Engineering Day, 2006, 2008
17. ECE Faculty Representative, Robotics Ph.D. Program Committee, 2008 - present
18. Academic Senate/General Faculty Representative, 2006-2008
19. Lunch Keynote Speaker, College of Engineering Tech Camp, 2008
20. Freshman Experience - Hot Topic Dinner Speaker, April 2010
21. ThinkBig Faculty Leader, Techie-Trekie, Aug 2010-May 2013
22. Chair, Robotics PhD Program, Aug 2010-Aug 2013
23. GT X-College Committee, Nov 2010-2012
24. EVPR/Provost GT-FIRE Review Panelist, 2011, 2016
25. Co-Chair, GT Strategic Committee - Revitalizing Undergraduate Education, 2011 – 2012
26. COE Associate-to-Full Professor RPT Committee, 2012 - 2016
27. Associate Vice President for Research Search Committee, 2013
28. Committee Member, College of Computing MOOMS Working Group, 2012-2013
29. Grand Challenges Faculty Fellow, 2015 – 2017
30. Center for Serve-Learn-Sustain Associate/Assistant Director Search Committee, 2016
31. PRIME Research Experiences for Teachers Faculty Advisor, 2015-2017
32. Chief Technology Officer Search Committee, 2019
33. Search Committee, Ivan Allen Dean Search, 2019 – 2020
34. Institute Strategic Plan Steering Committee, 2019 – 2020
35. Chair, School of Cybersecurity and Privacy Task Force, 2020
36. Search Chair, College of Engineering Dean Search, 2020

VII.B.3. School of ECE, Georgia Institute of Technology

1. ECE Representative, Georgia Tech Engineering and Computing Career Conference, 2005, 2006
2. Georgia Tech Women in ECE (WECE) Talk on Graduate Schools, 2005
3. Member, ECE Undergraduate Committee, 2005, 2009-2010
4. ECE Representative, Family Affair, 2006
5. Instructor, ECE HOT Days Camp, 2006-2007
6. ECE Hightower Chair Search Committee, 2006
7. Presenter, ECE FIRST LEGO League Camp, 2007
8. ECE Strategic Plan Steering Committee, 2007
9. ECE Academic Career Panel, 2009
10. IEEE GT Student Chapter Faculty Presentation, December 2009
11. ECE FACES Fellows mentor – 2009-2012
12. CS4911 (Senior Design) team advisor, Spring 2010
13. ECE Faculty Presentation, September 2010
14. VIP (Vertically-Integrated Project) I-Natural team advisor, Jan 2010-May 2016
15. Member, ECE Chair Search Committee, 2011 – 2012
16. ECE Statutory Advisory Committee, 2012 – 2015
17. Member, ECE Graduate Committee, 2015-2018

VII.B.4. The Ohio State University

1. OSU Provost Search Committee, 2021
2. Corporate Partnership Executive Oversight Committee, 2021-2022
3. RAISE Advisory Committee, 2021-2022
4. Honda LRT Leadership Team, 2021-present
5. Sustainability Institute Executive Steering Committee, 2021-present
6. Cancer Engineering Steering Committee, 2021-present
7. Board Chair and Member, Transportation Research Center (TRC), 2021-present
8. JobsOhio Enrollment Planning Group, 2021-2022
9. The Ohio State University Comprehensive Cancer Center Internal Advisory Board Committee, 2021-present
10. Executive Committee, Research Cyberinfrastructure and Advanced Computing Advisory Council (RCAC), 2021-present

VII.C. OTHER CONTRIBUTIONS

1. Engineering Advisor, FIRST (2001-2002) - Nonprofit founded to inspire students through participation in annual robotics competitions.
2. Space Expert, Challenger Center for Space Science Education, Space Day 2002 - Program designed to encourage students through interaction with visiting space experts, 2002.
3. Computer Tutor, Restore, Inc. - Provided computer training for a battered women's shelter, 1998-2002.
4. Founder, Pasadena Delta Academy - Mentoring program for young teen girls focused on math, science, and technology education, 2001-2004
5. Co-Founder, JUMP (JPL Undergraduate Mentoring Program for Women) Provides mentoring support to undergraduate engineering students, 2001-2005
6. NASA SBIR Sub-topic Manager for Mars In-situ Robotics Technology, 2003-2005
7. NSF ADVANCE Visiting Scholar, Electrical Engineering Department (Robotics, Automation, Control, and Mechatronics Group), University of Washington. Host: Dr. D. Denton/Dr. E. Riskin, May 2004.
8. Presenter: "Cool Jobs in Engineering," IEEE Engineers Week Global Marathon, March 2006.
9. Academic Mentor, Committee on Status of Women in Computing Research Distributed Mentor Project, 2007.
10. Career Coach, NSF ADVANCE Cross-Disciplinary Initiative for Minority Women Faculty Conf., April 2008.
11. Morehouse College Minority Biomedical Research Support-Research Initiative for Scientific Enhancement Mentor, 2009-2010.
12. Virtual Scientist guest lecturer - Match Charter Schools, English High School, John D. O' Bryant School of Math and Science, Boston, MA., March 2010.
13. Guest Presenter at Various K-12 schools (2005 – present): West Contra Costa Unified School District, Grady High School, Chamblee Middle School, Montgomery Elementary School, Ralph J. Bunche Middle School, Annual Back to School with the HistoryMakers, etc.
14. Member, IDA/DARPA Defense Science Study Group (DSSG), 2014-2015
15. Consulting: Future of AI – AI advisor on YouTube documentary series produced by Robert Downey Jr. examining the implications of AI on our society, 2018-2019

16. Consulting: Google AI Impact Challenge (https://ai.google/social-good/impact-challenge/) - Expert Reviewer for $25M grant funding pool, 2018-2019
17. Judge, Google Science Fair (https://www.googlesciencefair.com/competition/judges), 2017-2018
18. Testimony before Congress, Hearing before the House Judiciary Subcommittee on Courts, Intellectual Property and the Internet, https://judiciary.house.gov/legislation/hearings/lost-einsteins-lack-diversity-patent-inventorship-and-impact-america-s, March 2019
19. Invited Expert, Roundtable before the U.S. Senate Committee on Homeland Security and Governmental Affairs on "Artificial Intelligence: Challenges, Opportunities, and Trends"
20. XPrize AI for Good Global Summit, AI Technologies to Achieve Gender Equity Track, Expert, 2020
21. Eyegage Technical Advisor, https://www.eyegage.com/team, 2020-present

VIII. GRANTS AND CONTRACTS

VIII.A. AS PRINCIPAL OR CO-PRINCIPAL INVESTIGATOR

VIII.A.1. NASA JPL

1. Title: Software Tool for Automated Selection of Spacecraft Landing Site
   Organization: NASA/ Code R
   Contract Period: Aug. 2000 – Dec. 2000
   Amount Requested/Funded: $100K

2. Title: Safe Navigation of Planetary Rovers on Challenging Terrains
   Organization: NASA Cross Enterprise Technology Program
   Contract Period: Sept. 2000 – Sept. 2001
   Amount Requested/Funded: $500K ($200K allotted as Co-PI)

3. Title: Autonomous Reasoning for Safe Landing
   Organization: JPL Director's Research and Development Fund
   Contract Period: Sept. 2001 – Sept. 2002
   Amount Requested/Funded: $180K ($100K allotted as Co-PI)

4. Title: Intelligent Sensors for Planetary Exploration
   Organization: JPL Spontaneous Concepts
   Contract Period: Jan. 2001 – Sept. 2001
   Amount Requested/Funded: $30K

5. Title: Vehicle Subsystem/Autonomous Precision Landing
   Organization: NASA HEDS
   Contract Period: Sept. 2001 – Sept. 2002
   Amount Requested/Funded: $150K

6. Title: Multi-Sensor Hazard Avoidance
   Organization: NASA Mars Technology Program
   Contract Period: Sept. 2001 – Sept. 2002
   Amount Requested/Funded: $300K ($140K allotted as Co-PI)

7. Title: Evolvable, Adaptable, Reconfigurable (EVADR) Software Architecture for Vision-Based Applications
   Organization: NASA Exploration Team Program
   Contract Period: Sept. 2001 – Sept. 2002
   Amount Requested/Funded: $200K

8. Title: Human-Equivalent Navigation for Autonomous Planetary Rovers
   Organization: NASA Exploration Team (NEXT) Program
   Contract Period: Sept. 2002 – Sept. 2003
   Amount Requested/Funded: $150K ($80K allotted as Co-PI)

9. Title: Artificial Intelligence Toolkit to Enhance Understanding and Knowledge
Organization: JPL Spontaneous Concept
Contract Period: Jan. 2003 – Sept. 2003
Amount Requested/Funded: $25K

10. Title: Multi-Sensor Hazard Assessment and Safe Site Selection
Organization: NASA Mars Exploration Program Advanced Technologies
Contract Period: June 2004 – June 2005
Amount Requested/Funded: $298K ($100K allotted as Co-PI)

VIII.A.2. Georgia Institute of Technology

1. Title: A Synergistic Approach for Maximizing Human Automation System Performance (HumAnS)
Organization: Draper University IR&D Program
Contract Period: June 2004 - June 2006
Amount Requested/Funded: $191K

2. Title: Intensive Human-Robot Interaction Workshops for Learning and Knowledge Transfer
Organization: JPL – NASA ESMD Program Office
Contract Period: December 2005 – December 2006
Amount Requested/Funded: $65K

3. Title: Reconfigurable Sensor Networks for Fault-Tolerant In-Situ Sampling
Organization: NASA Earth Science Technology Office
Contract Period: September 2006 – September 2010
Amount Requested/Funded: $777K

4. Title: Autonomous Robot Manipulation for Therapeutic Play
Organization: RIM@GT Seed Grant
Contract Period: August 2007 – May 2008
Amount Requested/Funded: $25K (PI: Charles Kemp - BME, $12.5K allotted as Co-PI)

5. Title: Popularizing Computing in the Mainstream (PC2MAIN)
Organization: National Science Foundation
Contract Period: March 2007 – Dec 2011
Amount Requested/Funded: $600K (PI: Georgetown University, $160K allotted as Co-PI)

6. Title: Robot Learning from Teleoperative-Based Instruction and Multimodal Interaction
Organization: National Science Foundation
Contract Period: Aug 2007 – Aug 2011
Amount Requested/Funded: $826K

7. Title: Collaborative Research: Advancing Robotics for Societal Impact (ARTSI)
Organization: National Science Foundation
Contract Period: Oct 2007 – Oct 2010
Amount Requested/Funded: $162K

8. Title: Design Workshop to Solve National Problems of Interest through Diversity of Thought
Organization: Proctor and Gamble Higher Education Grant Program
Contract Period: Jan 2009 – March 2011
Amount Requested/Funded: $10K

9. Title: Lunar Robotics and Colonization Summer Science Camp
Organization: Exxon-Mobil/Bernard Harris Foundation
Contract Period: Jan 2009 – Dec 2009
Amount Requested/Funded: $74K

10. Title: Travel Support for 2009/2010 IJCAI Robotics Workshop and Exhibition
Organization: National Science Foundation (through AAAI as sponsored program office)
Contract Period: Sept 2009 – July 2011

Amount Requested/Funded: $55K

11. Title: Accessible Robotic Programming for Students with Disabilities
Organization: National Science Foundation
Contract Period: Feb 2010 – Feb 2013
Amount Requested/Funded: $497K

12. Title: VR-in-a-Box: Surgical Simulator - Supplementing Surgical Training for medical students and residents using a low-cost virtual reality simulator with real-time haptic feedback
Organization: HIP-ACTSI Healthcare Innovation Seed Grant Program
Contract Period: Dec 2011 – Dec 2012
Amount Requested/Funded: $31K

13. Title: Music-Induced Virtual Reality Interventions for Children with Cerebral Palsy
Organization: GRAMMY Foundation Grants Program
Contract Period: March 2012 – March 2013
Amount Requested/Funded: $17K

14. Title: Embedded Systems Programming Curriculum for Vertically-Integrated Projects
Sponsor: Intel
Contract Period: May 2012 - May 2014
Amount Requested/Funded: $21K

16. Title: TabAccess: A Wireless Controller for Tablet Accessibility
Organization: I-Corps Program - National Science Foundation
Contract Period: June 2012 – June 2013
Amount Requested/Funded: $50K

15. Title: NRI-Small: Robot Movement for Patient Improvement – Therapeutic Rehabilitation for Children with Disabilities
Organization: National Science Foundation
Contract Period: September 2012 – September 2015
Amount Requested/Funded: $632K

16. Title: An Assistive Input Device for Tablet Accessibility for Children with Motor Impairments
Organization: Atlanta Pediatric Device Consortium
Contract Period: October 2012 – August 2013
Amount Requested/Funded: $25K

17. Title: TabAccess Phase I/IIA/IIB
Organization: Georgia Research Alliance VentureLab Award
Contract Period: January 2013 – December 2015
Amount Requested/Funded: $132K

18. Title: REU Site: Summer Undergraduate Research in Engineering (SURE)
Organization: National Science Foundation
Contract Period: March 2013 – March 2016
Amount Requested/Funded: $444K

19. Title: Travel Support for AAAI-2013 Doctoral Consortium
Organization: National Science Foundation (through AAAI as sponsored program office)
Contract Period: May 2013 – May 2014
Amount Requested/Funded: $17K

20. Title: An Accessible Robotic Platform for Children with Disabilities
Organization: National Science Foundation
Contract Period: April 2014 – October 2015
Amount Requested/Funded: $197K

21. Title: Effectiveness of Rhythmic Auditory Stimulation in Virtual Reality Games for Improving Upper-Arm Function in Children with Cerebral Palsy
Organization: Center for Transforming Pediatric Healthcare Delivery
Contract Period: August 2014 – August 2015
Amount Requested/Funded: $50K

22. Title: NRT: Accessibility, Rehabilitation and Movement Science (ARMS): An Interdisciplinary Traineeship Program in Human-Centered Robotics
Organization: National Science Foundation
Contract Period: September 2015 – September 2021
Amount Requested/Funded: $2.9M

23. Title: Comprehensive Training Opportunity for Future Engineers
Organization: Georgia Tech (GT-FIRE Award)
Contract Period: June 2015 – June 2017
Amount Requested/Funded: $32K

22. Title: The Role of Technology for Empowering Children with Disabilities Worldwide
Organization: GA Board of Regents (USG World Summit Research Proposal Award)
Contract Period: October 2015
Amount Requested/Funded: $5K

23. Title: Effectiveness of Functional Strength Training in Virtual Reality Games for Improving Arm Function in Children with Cerebral Palsy – A Pilot Sequential Multiple Assignment Randomized Trial (SMART) Design
Organization: HIP/ ACTSI Research Seed Grant
Contract Period: Jan. 2016 – Jan. 2017
Amount Requested/Funded: $25K (PI: Yu-Ping Chen, $9K allotted as Co-PI)

24. Title: Developing human-machine systems that actively calibrate a user's trust
Organization: Air Force Office of Scientific Research
Contract Period: December 2016 – December 2019
Amount Requested/Funded: $763K (PI: Alan Wagner, $380K allotted as Co-PI)

25. Title: REU Site: Summer Undergraduate Research in Engineering (SURE) - Robotics
Organization: National Science Foundation
Contract Period: March 2018 – March 2022
Amount Requested/Funded: $288K (Required transfer to alternate GT PI in March 2021)

26. Title: Improving the Academic Matriculation of Undergraduate Women in Graduate Computing (I.AM.GradComputing) Workshop
Organization: exploreCSR: Google Computer Science Research Grant
Research Focused Workshops for Women
Contract Period: September 2018 – September 2020
Amount Requested/Funded: $53K

27. Title: EAGER: An Accessible Coding Curriculum for Engaging Underserved Students with Special Needs in Afterschool Programs
Organization: National Science Foundation
Contract Period: September 2018 – August 2021
Amount Requested/Funded: $300K (Transfer to alternate GT PI in March 2021; Continuation as unpaid Primary Investigator)

28. Title: EAGER: Pilot Study on Bias and Trust in AI Systems
Organization: National Science Foundation
Contract Period: October 2018 – February 2020
Amount Requested/Funded: $75K

29. Title: A Bias Detection Indictor for Highlighting Human Biases within Text-Based Communication Threads
Organization: CISCO

Contract Period: Oct. 2020 – Oct. 2022
Amount Requested/Funded: $168K (Transfer to alternate GT PI in March 2021; Continuation as unpaid Primary Investigator)

30. Title: Mitigating Gender and Racial Biases in AI/Robotics
Organization: Amazon Devices and Services
Contract Period: March 2021 – March 2024
Amount Requested/Funded: $260K (Transfer to alternate GT PI in March 2021; Continuation as unpaid Primary Investigator)

VII1.A.3. The Ohio State University

1. Title: Emerge: an art and technology space for prototyping livable futures with the community of Linden and The Ohio State University
Organization: Ohio State Office of Research Seed Fund for Racial Justice (SFRJ)
Contract Period: June 2021 - June 2022
Amount Funded: $50K (PI: Amy Youngs)

2. Title: ML Algorithms - Bias Assessment
Organization: Amazon Lab126
Contract Period: August 2021 – August 2022
Amount Funded: NDA

3. Title: Effect of a Humanoid Robot with Virtual Reality Games to Train Arm Function in Children with Cerebral Palsy
Organization: National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)
Contract Period: September 2022 – September 2025
Amount Funded: $600K (PI: Yu-Ping Chen, Georgia State University)

4. Title: Toward An Inclusive Ohio Higher Education Semiconductor Ecosystem and Workforce Through Student Centered Competency and Experiential, Multi-Entry Curriculum
Organization: INTEL
Contract Period: September 2022 – September 2025
Amount Funded: $1.5M

VIII.B. AS INVESTIGATOR OR COLLABORATOR

1. Title: Guidance, Navigation, Control (GN&C) Technology for Small Body Proximity Operations and Landing
Organization: JPL Research and Technology Development Fund
Contract Period: Sept. 2003 – Sept. 2004
Amount Requested/Funded: $400K ($50K allotted as Investigator)

2. Title: Steep Terrain Access Robot
Organization: JPL Research and Technology Development Fund
Contract Period: Sept. 2003 – Sept. 2004
Amount Requested/Funded: $250K ($10K allotted as Investigator)

3. Title: Development of DARWIN Humanoid Robots for Education, Research and Outreach
Organization: National Science Foundation
Contract Period: April 2011 – April 2012
Amount Requested/Funded: $400K (PI: Virginia Tech, $13.7K allotted as Collaborator)

4. Title: SBIR Phase I/IB/II: An Accessible Platform for Engaging Children with Motor Impairments in the Classroom Environment
Organization: National Science Foundation
Contract Period: January 2015 – March 2018
Amount Requested/Funded: $930K (PI: Zyrobotics)