

Tom Williams

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Associate Professor, Colorado School of Mines
Director, MIRRORLab

Research Interests

Mission: Developing genuinely helpful language-enabled intelligent agents

Interests: Artificial intelligence (AI); human-robot interaction (HRI); Cognitive science and systems; natural language understanding and pragmatics; augmented reality; robot ethics

Education

2013 – 2017 **Ph.D., Computer Science: Cognitive Science**, *Tufts University*.

Dissertation: Situated Natural Language Interaction in Uncertain and Open Worlds

Committee: Matthias Scheutz (Chair), Jan P. de Ruiter, Anselm Blumer, Candace Sidner

2011 – 2013 **M.S., Computer Science**, *Tufts University*.

2007 – 2011 **B.A., Computer Science**, *Hamilton College*.

Employment

Aug. 2022 → **Associate Professor**, *Colorado School of Mines*.

Aug. 2017 - **Assistant Professor**, *Colorado School of Mines*.

Aug. 2022

Spring 2017 **Teaching Fellow**, *Tufts University*.

Sum. 2016 **Visiting Researcher**, *University of Bremen*.

Honors and Awards

Paper Awards & Nominations

2022 **Best Long Paper Award**, (*1st*), ACL International Conference on Natural Language Generation (INLG), Han, Rygina & Williams.

Evaluating Referring Form Selection Models in Partially-Known Environments

2022 **Best Late Breaking Report Finalist**, (*3rd in 103 submissions*), ACM/IEEE International Conference on Human-Robot Interaction (HRI), Han & Williams.

A Task Design for Studying Referring Behaviors for Linguistic HRI

2021 **Best Student Paper Award Nominee**, (*Top 6 in 129 submissions*), International Conference on Social Robotics (ICSR), Naughton & Williams.

How to Tune your Draggin': Can Body Language Mitigate Face Threat in Robotic Noncompliance?

2021 **Best Paper Award Finalist in Cognitive Robotics**, (*Top 6 in 2800 Submissions*), International Conference on Intelligent Robots and Systems (IROS), Jackson, Li, Banisetty, Siva, Zhang, Dantam & Williams.

An Integrated Approach to Context-Sensitive Moral Cognition in Robot Cognitive Architectures

- 2018 **Best Paper Award Nominee**, (*Top 10 in 217 Submissions*), ACM/IEEE International Conference on Human-Robot Interaction (HRI), Williams, Thames, Novakoff, & Scheutz. “Thank You for Sharing that Interesting Fact!”: Effects of Capability and Context on Indirect Speech Act Use in Task-Based Human-Robot Dialogue

Honors and Awards to Me

- 2023 **Outstanding Program Committee Member**, ACM/IEEE International Conference on Human-Robot Interaction.
- 2022 **Faculty Excellence Award**, Colorado School of Mines.
- 2022 **W. M. Keck Undergraduate Mentoring Award**, Colorado School of Mines.
- 2022 **Departmental Nominee, Martin Luther King Jr. Award**, Colorado School of Mines.
- 2021 **CAREER Award**, NSF.
- 2021 **Special Recognition for Outstanding Reviews**, ACM/IEEE International Conference on Human-Robot Interaction.
- 2020 **Cohort 1 Fellow**, Cultural Competence in Computing (3C) Fellows Program.
- 2020 **Faculty Fellow**, Daniels Fund.
- 2020 **Full Faculty Nominated Membership**, Sigma Xi.
- 2019 **Early Career Faculty Award**, NASA.
- 2019 **Young Investigator Award**, AFOSR.
- 2018 **New and Future AI Educator Award**, *Invited second year participant*, EAAL.
- 2017 **New and Future AI Educator Award**, EAAL.
- 2015 **Teaching Fellowship**, Tufts Graduate Institute for Teaching.
Doctoral Consortia, YRRSDS 2014, HRI 2015, AAAI 2016.

Honors and Awards to Students

- 2023 **Ruchen Wen**, *Outstanding Graduate Student*, Department of Computer Science, Colorado School of Mines.
- 2023 **Sebastian Negrete-Alamillo**, *E-Days Engineer*, Department of Computer Science, Colorado School of Mines.
- 2023 **Cailyn Smith**, *Astronaut Scholarship*, Astronaut Scholarship Foundation.
- 2023 **Albert Phan**, *Outstanding Undergraduate Student*, Department of Computer Science, Colorado School of Mines.
- 2023 **Rena Zhu**, *Best Oral Presentation, Social and Theoretical Science*, GRADS Research Symposium, Colorado School of Mines.
- 2023 **Terran Mott**, *Special Recognition for Outstanding Reviews*, ACM/IEEE International Conference on Human-Robot Interaction.
- 2022 **Blake Jackson**, *Dr. Bhakta Rath and Sushama Rath Research Award Nominee*, Colorado School of Mines.
- 2022 **Blake Jackson**, *Outstanding Graduate Student*, Department of Computer Science, Colorado School of Mines.
- 2022 **Will Culpepper**, *Outstanding Undergraduate Researcher Honorable Mention*, CRA.

- 2022 **Landon Brown**, *Outstanding Undergraduate Researcher Honorable Mention*, CRA.
- 2022 **Nichole Starr**, *Outstanding Undergraduate Researcher Honorable Mention*, CRA.
- 2022 **Terran Mott**, *Accepted Participant*, HRI Pioneers.
- 2022 **Alexandra Bejarano**, *Accepted Participant*, HRI Pioneers.
- 2022 **Saad Elbeleidy**, *Accepted Participant*, CHI Doctoral Consortium.
- 2021 **Saad Elbeleidy**, *Accepted Participant*, IDC Doctoral Consortium.
- 2021 **Alexandra Bejarano**, *GRFP Honorable Mention*, NSF.
- 2021 **Aidan Naughton**, *Best Poster Award (Non-PhD)*, CS@Mines C-MAPP 2021.
- 2021 **Ruchen Wen**, *Accepted Participant*, HRI Pioneers.
- 2020 **Nhan Tran**, *Outstanding Graduating Student*, Department of Computer Science, Colorado School of Mines.
- 2020 **Ryan Blake Jackson**, *Best Poster Award*, CS@Mines C-MAPP 2020.
- 2020 **Nhan Tran**, *Accepted Participant*, HRI Pioneers.
- 2020 **Ryan Blake Jackson**, *New and Future AI Educator Award*, EAAL.
- 2020 **Thomas Bennett**, *Accepted Participant*, AAAI Undergraduate Consortium.
- 2019 **Ryan Blake Jackson**, *Accepted Participant*, HRI Pioneers.
- 2019 **Ryan Blake Jackson**, *Accepted Participant*, AIES Student Program.
- 2019 **Nhan Tran**, *Accepted Participant*, AAAI Student Outreach Workshop, AAAI/EAAL.
- 2018 **Ruchen Wen**, *Accepted Participant*, CRA-W Graduate Cohort.
- 2018 **Ruchen Wen**, *Best Talk Runner Up*, Rocky Mountain Celebration of Women in Computing.
- 2018 **Nhan Tran**, *Outstanding Undergraduate Researcher*, Department of Computer Science, Colorado School of Mines.
- 2018 **Nhan Tran**, *Accepted Participant*, AAAI Student Outreach Workshop, AAAI/EAAL.

Publications

Journal Articles

- [J1] Leanne Hirshfield, Christopher Wickens, E. Doherty, C. Spencer, Lucas Hayne, Trevor Grant, Tom Williams, and Hannah Blanchard-Obolsky. "Toward Workload-Based Adaptive Automation: On the Utility of fNIRS for Measuring Neurophysiological Correlates of Load in Multiple Resources in the Brain". In: (2023 (**In Revision**)).
- [J2] Michael Walker, Thao Phung, Tathagata Chakraborti, Tom Williams, and Daniel Szafir. "Virtual, Augmented, and Mixed Reality for Human-Robot Interaction: A Survey and Virtual Design Element Taxonomy". In: *ACM Transactions on Human-Robot Interaction (T-HRI)* (2023 (**In Press**)). arXiv: 2202.11249 [cs.R0].
- [J3] Tom Williams, Cynthia Matuszek, Kristiina Jokinen, Raj Korpan, James Pustejovsky, and Brian Scassellati. "Voice in the Machine: Are We Ready for Language-Capable Robots?" In: *Communications of the ACM* (2023 (**In Press**)).
- [J0] Tom Williams. "Course Correction: Cognitive Systems Learning Objectives for AI Education". In: 2023.
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- [J0] Tom Williams, Cynthia Matuszek, Ross Mead, and Nick DePalma. “Scarecrows in Oz: The Use of Large Language Models in HRI”. In: 2023.
- [J4] Landon Brown, Jared Hamilton, Zhao Han, Albert Phan, Thao Phung, Eric Hansen, Nhan Tran, and Tom Williams. “Best of Both Worlds? Combining Different Forms of Mixed Reality Deictic Gestures”. In: *ACM Transactions on Human-Robot Interaction (T-HRI)* (2022).
- [J5] Ryan Blake Jackson and Tom Williams. “Enabling Morally Sensitive Robotic Clarification Requests”. In: *ACM Transactions on Human-Robot Interaction* (2022).
- [J6] Ruchen Wen, Boyoung Kim, Elizabeth Phillips, Qin Zhu, and Tom Williams. “Comparing Norm-Based and Role-Based Strategies for Robot Communication of Role-Grounded Moral Norms”. In: *ACM Transactions on Human-Robot Interaction (T-HRI)* (2022).
- [J7] Gordon Briggs, Tom Williams, Ryan Blake Jackson, and Matthias Scheutz. “Why and How Robots Should Say ‘No’”. In: *International Journal of Social Robotics* (2021).
- [J8] Ryan Blake Jackson and Tom Williams. “A Theory of Social Agency for Human-Robot Interaction”. In: *Frontiers in Robotics and AI: Special Issue on Rising Stars in Human-Robot Interaction* (2021).
- [J9] Qin Zhu, Tom Williams, and Ruchen Wen. “Role-based Morality, Ethical Pluralism, and Morally Capable Robots”. In: *Journal of Contemporary Eastern Asia* (2021).
- [J10] David Feil-Seifer, Kerstin Haring, Silvia Rossi, Alan Wagner, and Tom Williams. “Where to Next? The Impact of COVID-19 on Human-Robot Interaction Research”. In: *ACM Transactions on Human-Robot Interaction* (2020).
- [J11] Qin Zhu, Tom Williams, Blake Jackson, and Ruchen Wen. “Blame-Laden Moral Rebukes and the Morally Competent Robot: A Confucian Ethical Perspective”. In: *Science and Engineering Ethics* (2020).
- [J12] Tom Williams, Fereshta Yazdani, Prasanth Suresh, Matthias Scheutz, and Michael Beetz. “Dempster-Shafer Theoretic Resolution of Referential Ambiguity”. In: *Autonomous Robots* (2018).
- [J13] Gordon Briggs, Tom Williams, and Matthias Scheutz. “Enabling Robots to Understand Indirect Speech Acts in Task-Based Interactions”. In: *Journal of Human-Robot Interaction (JHRI)* (2017).
- [J14] Tom Williams. “A Consultant Framework for Natural Language Processing in Integrated Robot Architectures”. In: *IEEE Intelligent Informatics Bulletin (IIB)* (2017), pp. 10–14.
- [J15] Tom Williams and Matthias Scheutz. “The State-of-the-Art in Autonomous Wheelchairs Controlled through Natural Language: A Survey”. In: *Robotics and Autonomous Systems (RAS)* (2017).
- [J16] Tom Williams, Priscilla Briggs, and Matthias Scheutz. “Covert Robot-Robot Communication: Human Perceptions and Implications for Human-Robot Interaction”. In: *Journal of Human-Robot Interaction (JHRI)* (2015).

Book Chapters

- [B1] Marynel Vazquez, Hatice Gunes, Tom Williams, and Ryan Blake Jackson. “Computational Perception of Social and Normative Context for Human-Agent Interactions”. In: *Human-Centered Machine Learning*. Ed. by Gonzalo Ramos, Rebecca Fiebrink, and Marco Gillies. 2023 (**In Revision**).

- [B2] Alan R. Wagner, David Feil-Seifer, Kerstin S. Haring, Silvia Rossi, Tom Williams, Hongsheng He, and S. Sam Ge, eds. *Social Robotics: 12th International Conference, ICSR 2020, Golden, CO, USA, November 14–18, 2020, Proceedings*. Lecture Notes in Computer Science. Springer, 2020.
- [B3] Matthias Scheutz, Thomas Williams, Evan Krause, Bradley Oosterveld, Vasanth Sarathy, and Tyler Frasca. “An Overview of the Distributed Integrated Cognition Affect and Reflection DIARC Architecture”. In: *Cognitive Architectures*. Ed. by Maria Isabel Aldinhas Ferreira, João S. Sequeira, and Rodrigo Ventura. Intelligent Systems, Control and Automation: Science and Engineering book series. Springer, 2019.
- [B4] Tom Williams and Matthias Scheutz. “Reference in Robotics: A Givenness Hierarchy Theoretic Approach”. In: *The Oxford Handbook of Reference*. Ed. by Jeanette Gundel and Barbara Abbott. Oxford University Press, 2019.

Refereed Conference Papers

- [C1] Alexandra Bejarano and Tom Williams. “No Name, No Voice, Less Trust: Robot Group Identity Performance, Entitativity, and Trust Distribution”. In: 2023 (**In Review**).
 - [C2] Saad Elbeleidy, Terran Mott, Dan Liu, Ellen Yi-Luen Do, Elizabeth Reddy, and Tom Williams. “Beyond the Session: Centering Teleoperators in Robot-Assisted Therapy Reveals the Bigger Picture”. In: 2023 (**In Review**).
 - [C3] Saad Elbeleidy, Elizabeth Reddy, and Tom Williams. “The Invisible Labor of Authoring Dialogue for Teleoperated Socially Assistive Robots”. In: 2023 (**In Review**).
 - [C4] Hideki Garcia Goo, Katie Winkle, Tom Williams, and Megan Strait. “Victims and Observers: How Identity, Experience, and Biases Shape Perceptions of Robot Abuse”. In: 2023 (**In Review**).
 - [C5] Sihui Li, Sriram Siva, Terran Mott, Tom Williams, Han Zhang, and Neil Dantam. “Command Rejection in Privacy-Sensitive Contexts: An Integrated Robotic System Approach”. In: 2023 (**In Review**).
 - [C6] Terran Mott and Tom Williams. “Exploring Perspectives on Robot Responses to Norm Violations Through a Narrative Survey”. In: 2023 (**In Review**).
 - [C7] Terran Mott and Tom Williams. “How Can Dog Handlers Help Us Understand the Future of Wilderness Search & Rescue Robots?” In: 2023 (**In Review**).
 - [C8] Gabriel Del Castillo*, Grace Clark*, Zhao Han*, and Tom Williams. “Exploring the Naturalness of Cognitive Status-Informed Referring Form Selection Models”. In: *ACL International Conference on Natural Language Generation (INLG)*. 2023.
 - [C9] Zhao Han and Tom Williams. “Evaluating Cognitive Status-Informed Referring Form Selection for Human-Robot Interactions”. In: *Annual Meeting of the Cognitive Science Society (CogSci)*. 2023.
 - [C10] Zhao Han*, Yifei Zhu*, Albert Phan, Fernando Sandoval Garza, Amia Castro, and Tom Williams. “Crossing Reality: Comparing Physical and Virtual Robot Deixis”. In: *ACM/IEEE International Conference on Human-Robot Interaction*. 25.2% acceptance rate. *Equal contribution, 2023.
 - [C11] Boyoung Kim, Ruchen Wen, Qin Zhu, Tom Williams, and Elizabeth Phillips. “The impact of different ethical frameworks underlying a robot’s advice on charitable donations”. In: 2023.
 - [C12] Sayanti Roy, Trey Smith, Brian Coltin, and Tom Williams. “I Need Your Help... or Do I? Maintaining Situation Awareness Through Performative Autonomy”. In: *ACM/IEEE International Conference on Human-Robot Interaction*. 25.2% acceptance rate, 2023.
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- [C13] Rafael Silva Sousa, Michelle Lieng, Emil Muly, and Tom Williams. “Worth the Wait: Understanding How the Benefits of Performative Autonomy Depend on Communication Latency”. In: 2023.
- [C14] Rafael Silva Sousa, Michelle Lieng, and Tom Williams. “Forget About It: Entity-Level Working Memory Models for Referring Expression Generation in Robot Cognitive Architectures”. In: *Annual Meeting of the Cognitive Science Society (CogSci)*. 2023.
- [C15] Nhan Tran, Trevor Grant, Thao Phung, Leanne Hirshfield, Christopher Wickens, and Tom Williams. “Now Look Here! ↓ Mixed Reality Improves Robot Communication Without Cognitive Overload”. In: *International Conference on Virtual, Augmented, and Mixed Reality (VAMR), held as part of the International Conference on Human-Computer Interaction (HCI)*. 2023.
- [C16] Ruchen Wen, Alyssa Hanson, Zhao Han, and Tom Williams. “Fresh Start: Encouraging Politeness in Wakeword-Driven Human-Robot Interaction”. In: *ACM/IEEE International Conference on Human-Robot Interaction*. 25.2% acceptance rate, 2023.
- [C17] Ruchen Wen, Boyoung Kim, Elizabeth Phillips, Qin Zhu, and Tom Williams. “On Further Reflection... Moral Reflections Enhance Robotic Moral Persuasive Capability”. In: *PERSUASIVE: International Conference on Persuasive Technology*. 37.7% Acceptance Rate, 2023.
- [C18] Tom Williams. “The Eye of the Robot Beholder: Ethical Risks of Representation, Recognition, and Reasoning over Identity Characteristics in Human-Robot Interaction”. In: *Companion Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI)*. 18.2% acceptance rate, 2023.
- [C0] Tom Williams and Kerstin Haring. “No Justice, No Robots: From the Dispositions of Policing to an Abolitionist Robotics”. In: *Proceedings of the AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*. 28.9% acceptance rate, 2023.
- [C19] Yifei Zhu, Ruchen Wen, and Tom Williams. “Robots for Social Justice: An Engineering Education Driven Framework for Human-Robot Interaction”. In: 2023.
- [C20] Alexandra Bejarano, Samantha Reig, Priyanka Senapati, and Tom Williams. “You Had Me at Hello: The Impact of Robot Group Presentation Strategies on Mental Model Formation”. In: *Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 24.8% acceptance rate, 2022.
- [C21] Will Culpepper, Thomas A. Bennett, Lixiao Zhu, Rafael Sousa Silva, Ryan Blake Jackson, and Tom Williams. “IPOWER: Incremental, Probabilistic, Open-World Reference Resolution”. In: *Annual Meeting of the Cognitive Science Society (CogSci)*. 2022.
- [C22] Saad Elbeleidy, Terran Mott, Dan Liu, and Tom Williams. “Practical Considerations for Deploying Robot Teleoperation in Therapy and Telehealth”. In: *IEEE International Symposium on Human-Robot Interactive Communication (RO-MAN)*. 2022.
- [C23] Saad Elbeleidy, Terran Mott, and Tom Williams. “Practical, Ethical, and Overlooked: Teleoperated Socially Assistive Robots in the Quest for Autonomy”. In: *Companion Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI)*. 2022.
- [C24] Zhao Han, Jenna Parrillo, Alexander Wilkinson, Holly A. Yanco, and Tom Williams. “Projecting Robot Navigation Paths: Hardware and Software for Projected AR”. In: *Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI) (Short Contributions)*. 2022.
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- [C25] Zhao Han, Polina Rygina, and Tom Williams. “Evaluating Referring Form Selection Models in Partially-Known Environments”. In: *ACL International Conference on Natural Language Generation (INLG)*. Best Long Paper Award winner, 2022.
- [C26] Terran Mott, Alexandra Bejarano, and Tom Williams. “Robot Co-design Can Help Us Engage Child Stakeholders in Ethical Reflection”. In: *Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 24.8% acceptance rate, 2022.
- [C27] Cailyn Smith, Charlotte Gorgemans, Ruchen Wen, Saad Elbeleidy, Sayanti Roy, and Tom Williams. “Leveraging Intentional Factors and Task Context to Predict Linguistic Norm Adherence”. In: *Annual Meeting of the Cognitive Science Society (CogSci)*. 2022.
- [C28] Kevin Spevak, Zhao Han, Tom Williams, and Neil Dantam. “Givenness Hierarchy Informed Optimal Sentence Planning in Situated Contexts”. In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2022.
- [C29] Ruchen Wen, Brandon Barton, Sebastian Faure, and Tom Williams. “Unpretty Please: Ostensibly Polite Wakewords Discourage Politeness in both Robot-Directed and Human-Directed Communication”. In: *ACM International Conference on Multimodal Interaction (ICMI)*. 2022.
- [C30] Ruchen Wen, Zhao Han, and Tom Williams. “Teacher, Teammate, Subordinate, Friend: Generating Norm Violation Responses Grounded in Role-based Relational Norms”. In: *Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 24.8% acceptance rate, 2022.
- [C31] Katie Winkle, Ryan Blake Jackson, Gaspar Isaac Melsion, Drazen Brscic, Iolanda Leite, and Tom Williams. “Norm-Breaking Responses to Sexist Abuse: A Cross-Cultural Human Robot Interaction Study”. In: *Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 24.8% acceptance rate, 2022.
- [C32] Saad Elbeleidy, Daniel Rosen, Dan Liu, Aubrey Shick, and Tom Williams. “Analyzing Teleoperation Interface Usage of Robots in Therapy for Children with Autism”. In: *Proceedings of the ACM Interaction Design and Children Conference (IDC)*. 2021.
- [C33] Jared Hamilton*, Thao Phung*, Nhan Tran, and Tom Williams. “What’s The Point? Tradeoffs Between Effectiveness and Social Perception When Using Mixed Reality to Enhance Gesturally Limited Robots”. In: *Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 22.8% acceptance rate. *Equal contribution, 2021.
- [C34] Ryan Blake Jackson*, Sihui Li*, Santosh Balajee Banisetty, Sriram Siva, Hao Zhang, Neil Dantam, and Tom Williams. “An Integrated Approach to Context-Sensitive Moral Cognition in Robot Cognitive Architectures”. In: *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 45% acceptance rate; Best Paper Nominee, 2021.
- [C35] Boyoung Kim, Ruchen Wen, Qin Zhu, Tom Williams, and Elizabeth Phillips. “Robots as Moral Advisors: The Effects of Deontological, Virtue, and Confucian Ethics on Encouraging Honest Behavior”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI)*. 21.7% acceptance rate, 2021.
- [C36] Aidan Naughton and Tom Williams. “How to Tune your Draggin’: Can Body Language Mitigate Face Threat in Robotic Noncompliance?” In: *International Conference on Social Robotics; Best Student Paper Nominee*. 2021.
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- [C37] Poulomi Pal, Grace Clark, and Tom Williams. “Givenness Hierarchy Theoretic Referential Choice in Situated Contexts”. In: *Proceedings of the Annual Meeting of the Cognitive Science Society (COGSCI)*. 2021.
- [C38] Stephen C. Rea, Qin Zhu, Dean Nieusma, Kylee Shiekh, and Tom Williams. “Cultivating Ethical Engineers in the Age of AI and Robotics: An Educational Cultures Perspective”. In: *IEEE International Symposium on Technology and Society (ISTAS)*. 2021.
- [C39] Tom Williams, Daniel Ayers, Camille Kaufman, Jon Serrano, Shania Jo Runningrabbit, Sayanti Roy, and Poulomi Pal. “Deconstructed Trustee Theory: Disentangling Trust in Body and Identity in Multi-Robot Distributed Systems”. In: *Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 22.8% acceptance rate, 2021.
- [C40] Ryan Blake Jackson, Tom Williams, and Nicole M. Smith. “Exploring the Role of Gender in Perceptions of Robotic Noncompliance”. In: *Proceedings of the 15th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 23.6% acceptance rate, 2020.
- [C41] Jane Lockshin and Tom Williams. ““We Need to Start Thinking Ahead”: The Impact of Social Context on Linguistic Norm Adherence”. In: *Proceedings of the Annual Meeting of the Cognitive Science Society (COGSCI)*. 63% acceptance rate (Poster), 2020.
- [C42] Poulomi Pal, Akshay Swaminathan, Lixiao Zhu, Andrea Golden-Lasher, and Tom Williams. “Givenness Hierarchy Theoretic Cognitive Status Filtering”. In: *Proceedings of the Annual Meeting of the Cognitive Science Society (COGSCI)*. 22% acceptance rate (Oral), 2020.
- [C43] Ruchen Wen, Mohammed Aun Siddiqui, and Tom Williams. “Dempster-Shafer Theoretic Learning of Indirect Speech Act Comprehension Norms”. In: *Proceedings of the 34th AAAI Conference on Artificial Intelligence*. 20.6% acceptance rate, 2020.
- [C44] Tom Williams, Daniel Grollman, Mingyuan Han, Ryan Blake Jackson, Jane Lockshin, Ruchen Wen, Zachary Nahman, and Qin Zhu. ““Excuse Me, Robot”: Impact of Polite Robot Wakewords on Human-Robot Politeness”. In: *International Conference on Social Robotics*. 55% acceptance rate (Short-Form Presentation), 2020.
- [C45] Tom Williams, Qin Zhu, and Daniel Grollman. “An Experimental Ethics Approach to Robot Ethics Education”. In: *Proceedings of the 10th Symposium on Educational Advances in Artificial Intelligence*. 2020.
- [C46] Tom Williams, Qin Zhu, Ruchen Wen, and Ewart J. de Visser. “The Confucian Matador: Three Defenses Against the Mechanical Bull”. In: *Companion Proceedings of the 15th ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI)*. 19% acceptance rate, 2020.
- [C47] Lixiao Zhu and Tom Williams. “Effects of Proactive Explanations by Robots on Human-Robot Trust”. In: *International Conference on Social Robotics*. 55% acceptance rate (Short-Form Presentation), 2020.
- [C48] Ryan Blake Jackson, Ruchen Wen, and Tom Williams. “Tact in Noncompliance: The Need for Pragmatically Apt Responses to Unethical Commands”. In: *Proceedings of the AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*. 15% acceptance rate (oral), 2019.
- [C49] Ryan Blake Jackson and Tom Williams. “Language-Capable Robots may Inadvertently Weaken Human Moral Norms”. In: *Companion Proceedings of the 14th ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI)*. 25% acceptance rate, 2019.
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- [C50] Tom Williams, Matthew Bussing, Sebastian Cabrol, Elizabeth Boyle, and Nhan Tran. “Mixed Reality Deictic Gesture for Multi-Modal Robot Communication”. In: *Proceedings of the 14th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 24% acceptance rate, 2019.
- [C51] Ryan Blake Jackson and Tom Williams. “Robot: Asker of Questions and Changer of Norms?”. In: *Proceedings of the International Conference on Robot Ethics and Standards*. 2018.
- [C52] Daniel Kasenberg, Vasanth Sarathy, Thomas Arnold, Matthias Scheutz, and Tom Williams. “Quasi-Dilemmas for Artificial Moral Agents”. In: *Proceedings of the International Conference on Robot Ethics and Standards*. 2018.
- [C53] Tom Williams, Blake Jackson, and Jane Lockshin. “A Bayesian Analysis of Moral Norm Malleability during Clarification Dialogues”. In: *Proceedings of the 40th annual meeting of the Cognitive Science Society (COGSCI)*. 2018.
- [C54] Tom Williams, Daria Thames, Julia Novakoff, and Matthias Scheutz. ““Thank You for Sharing that Interesting Fact!”: Effects of Capability and Context on Indirect Speech Act Use in Task-Based Human-Robot Dialogue”. In: *Proceedings of the 13th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 23% acceptance rate; Best Paper Nominee, 2018.
- [C55] Tom Williams, Ravenna Thielstrom, Evan Krause, Bradley Oosterveld, and Matthias Scheutz. “Augmenting Robot Knowledge Consultants with Distributed Short Term Memory”. In: *International Conference on Social Robotics*. 2018.
- [C56] Maxwell Bennett, Tom Williams, Daria Thames, and Matthias Scheutz. “Differences in Interaction Patterns and Perception for Teleoperated and Autonomous Humanoid Robots”. In: *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 45% acceptance rate, 2017.
- [C57] Tom Williams, Collin Johnson, Matthias Scheutz, and Benjamin Kuipers. “A Tale of Two Architectures: A Dual-Citizenship Integration of Natural Language and the Cognitive Map”. In: *Proceedings of the 16th International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*. 26% acceptance rate, 2017.
- [C58] Tom Williams and Matthias Scheutz. “Referring Expression Generation Under Uncertainty: Algorithm and Evaluation Framework”. In: *Proceedings of the 10th International Conference on Natural Language Generation (INLG)*. 2017.
- [C59] Tom Williams and Matthias Scheutz. “Resolution of Referential Ambiguity in Human-Robot Dialogue Using Dempster-Shafer Theoretic Pragmatics”. In: *Proceedings of Robotics: Science and Systems (RSS)*. 39.7% acceptance rate, 2017.
- [C60] Tom Williams, Saurav Acharya, Stephanie Schreitter, and Matthias Scheutz. “Situated Open World Reference Resolution for Human-Robot Dialogue”. In: *Proceedings of the 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 25% acceptance rate, 2016.
- [C61] Tom Williams and Matthias Scheutz. “A Framework for Resolving Open-World Referential Expressions in Distributed Heterogeneous Knowledge Bases”. In: *Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI)*. 26% acceptance rate, 2016.
- [C62] Tom Williams, Gordon Briggs, Bradley Oosterveld, and Matthias Scheutz. “Going Beyond Command-Based Instructions: Extending Robotic Natural Language Interaction Capabilities”. In: *Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence (AAAI)*. 27% acceptance rate, 2015.
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- [C63] Tom Williams and Matthias Scheutz. “A Domain-Independent Model of Open-World Reference Resolution”. In: *Proceedings of the 37th annual meeting of the Cognitive Science Society (COGSCI)*. 2015.
- [C64] Tom Williams and Matthias Scheutz. “POWER: A Domain-Independent Algorithm for Probabilistic, Open-World Entity Resolution”. In: *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2015.
- [C65] Evan Krause, Michael Zillich, Tom Williams, and Matthias Scheutz. “Learning to Recognize Novel Objects in One Shot through Human-Robot Interactions in Natural Language Dialogues”. In: *Proceedings of the Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI)*. 28% acceptance rate, 2014.
- [C66] Tom Williams, Priscilla Briggs, Nathaniel Pelz, and Matthias Scheutz. “Is Robot Telepathy Acceptable? Investigating Effects of Nonverbal Robot-Robot Communication on Human-Robot Interaction”. In: *Proceedings of the 23rd IEEE Symposium on Robot and Human Interactive Communication (RO-MAN)*. 2014.
- [C67] Tom Williams, Rafael C Núñez, Gordon Briggs, Matthias Scheutz, Kamal Premaratne, and Manohar N Murthi. “A Dempster-Shafer Theoretic Approach to Understanding Indirect Speech Acts”. In: *Advances in Artificial Intelligence— Proceedings of the 14th Ibero-American Conference on AI (IBERAMIA)*. 26% acceptance rate for Natural-Language Processing track, 2014.
- [C68] Tom Williams, Rehj Cantrell, Gordon Briggs, Paul Schermerhorn, and Matthias Scheutz. “Grounding Natural Language References to Unvisited and Hypothetical Locations”. In: *Proceedings of the Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI)*. 29% acceptance rate, 2013.
- [C69] Leanne Hirshfield, Rebecca Gulotta, Stuart Hirshfield, Sam Hincks, Matthew Russell, Rachel Ward, Tom Williams, and Robert Jacob. “This is your brain on interfaces: enhancing usability testing with functional near-infrared spectroscopy”. In: *Proceedings of the annual conference on Human factors in computing systems (CHI)*. 23% acceptance rate, 2011.
- [C70] Leanne Hirshfield, Stuart Hirshfield, Sam Hincks, Matthew Russell, Rachel Ward, and Tom Williams. “Trust in Human-Computer Interactions as Measured by Frustration, Surprise, and Workload”. In: *Foundations of Augmented Cognition. Directing the Future of Adaptive Systems (FAC)*. 2011.

Lightly Refereed and Invited Workshop, Symposium, and Conference Papers

- [W1] Alexandra Bejarano, Sebastian Negrete-Alamillo, and Tom Williams. “Conversations with Identity Performing Robots: Considerations for Algorithms and Interfaces”. In: *HRI Workshop on Human-Robot Conversational Interaction*. 2023.
- [W2] Boyoung Kim, Elizabeth Phillips, Tom Williams, and Qin Zhu. “Perspectives on Moral Agency for HRI: Cognitive Construct or Ontological State? Toward Moral Agency Quantification in Human-Robot Interaction”. In: *Proceedings of the Workshop on Perspectives on Moral Agency in Human-Robot Interaction*. 2023.
- [W3] Terran Mott and Tom Williams. “Community Futures With Morally Capable Robotic Technology”. In: *Proceedings of the Workshop on Perspectives on Moral Agency in Human-Robot Interaction*. 2023.
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- [W4] Tom Williams and Kerstin Haring. “No Justice, No Robots: Taking a hard look at Robotcist-Police Collaborations”. In: *HRI Workshop on Diversity, Equity, and Inclusion in HRI*. 2023.
- [W5] Hideki Garcia, Katie Winkle, Tom Williams, and Megan Strait. “Robots Need the Ability to Navigate Abusive Interactions”. In: *HRI Workshop on Diversity, Equity, and Inclusion in HRI*. 2022.
- [W6] Zhao Han, Boyoung Kim, Holly Yanco, and Tom Williams. “Causal Robot Communication Inspired by Observational Learning Insights”. In: *AAAI Spring Symposium on Closing the Assessment Loop: Communicating Proficiency and Intent in Human-Robot Teaming*. 2022.
- [W7] Zhao Han, Albert Phan, Amia Castro, Fernando Sandoval Garza, and Tom Williams. “Towards an Understanding of Physical vs Virtual Robot Appendage Design”. In: *HRI Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*. 2022.
- [W8] Zhao Han and Tom Williams. “Towards Formalizing HRI Data Collection Processes”. In: *4th Annual Workshop on Novel and Emerging Test Methods & Metrics for Effective HRI*. 2022.
- [W9] Zhao Han, Tom Williams, and Holly Yanco. “Mixed-Reality Robot Behavior Replay: A System Implementation”. In: *Proceedings of the AAAI Fall Symposium on AI for HRI (AI-HRI)*. 2022.
- [W10] Ruchen Wen and Tom Williams. “Hidden Complexities in the Computational Modeling of Proportionality for Robotic Norm Violation Response”. In: *Proceedings of the AAAI Fall Symposium on AI for HRI (AI-HRI)*. 2022.
- [W11] Tom Williams. “Should Robots be Colorblind?” In: *HRI Workshop on Diversity, Equity, and Inclusion in HRI*. 2022.
- [W12] Ryan Blake Jackson, Alexa Bejarano, Katie Winkle, and Tom Williams. “Design, Performance, and Perception of Robot Identity”. In: *Proceedings of the Workshop on Robo-Identity: Artificial identity and multi-embodiment at HRI 2021*. 2021.
- [W13] Ryan Blake Jackson and Tom Williams. “Social Good Versus Robot Well-Being: On the Principle of Procreative Beneficence and Robot Gendering”. In: *Proceedings of the RO-MAN 2021 Workshop on Gendering Robots: Ongoing (Re)configurations of Gender in Robotics (GenR)*. 2021.
- [W14] Boyoung Kim, Ruchen Wen, Ewart J. de Visser, Qin Zhu, Tom Williams, and Elizabeth Phillips. “Investigating Robot Moral Advice to Deter Cheating Behavior”. In: *Proceedings of the RO-MAN 2021 Workshop on Robot Behavior Adaptation to Human Social Norms (TSAR)*. 2021.
- [W15] Alex Leto, Toni Lefton, and Tom Williams. “Using Markov Chain Text Generators to Facilitate Found Poetry Creation”. In: *Proceedings of Educational Advances in Artificial Intelligence: Model AI Assignments Track*. 2021.
- [W16] Terran Mott, Christopher Reardon, Hao Zhang, and Tom Williams. “You Have Time to Explore Over Here! Augmented Reality for Enhanced Situation Awareness in Human-Robot Collaborative Exploration”. In: *Proceedings of the 4th International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2021.
- [W17] Nichole Starr, Bertram Malle, and Tom Williams. “I Need Your Advice... Human Perceptions of Robot Moral Advising Behaviors”. In: *Proceedings of the TRAITS Workshop at HRI 2021*. 2021.
- [W18] Tom Williams and Ruchen Wen. “Human Capabilities as Guiding Lights for the Field of AI-HRI: Insights from Engineering Education”. In: *AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction (AI-HRI)*. 2021.
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- [W19] Katie Winkle, Ryan Blake Jackson, Alexa Bejarano, and Tom Williams. “On the Flexibility of Robot Social Identity Performance: Benefits, Ethical Risks and Open Research Questions for HRI”. In: *Proceedings of the Workshop on Robo-Identity: Artificial identity and multi-embodiment at HRI 2021*. 2021.
- [W20] Justin Bishop, Jaylen Burgess, Cooper Ramos, Jade B. Driggs, Tom Williams, Chad C. Tossell, Elizabeth Phillips, Tyler H. Shaw, and Ewart J. de Visser. “CHAOPT: A Testbed for Evaluating Human-Autonomy Team Collaboration Using the Video Game Overcooked!2”. In: *Proceedings of the Systems and Information Engineering Design Symposium (SIEDS)*. 2020.
- [W21] Jared Hamilton, Nhan Tran, and Tom Williams. “Tradeoffs Between Effectiveness and Social Perception when using Mixed Reality to Supplement Gesturally Limited Robots”. In: *Proceedings of the 3rd International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2020.
- [W22] Ryan Blake Jackson and Tom Williams. “Enabling Morally Sensitive Robotic Clarification Requests”. In: *Advances in Cognitive Systems*. Non-archival Poster Presentation. 2020.
- [W23] Poulomi Pal and Tom Williams. “Toward Givenness Hierarchy Theoretic Natural Language Generation”. In: *Advances in Cognitive Systems*. Non-archival Poster Presentation. 2020.
- [W24] Savannah Paul, Christopher Reardon, Tom Williams, and Hao Zhang. “Designing Augmented Reality Visualizations for Synchronized and Time-Dominant Human-Robot Teaming”. In: *Proceedings of the SPIE Defense and Commercial Sensing Conference on Virtual, Augmented, and Mixed Reality (XR) Technology for Multi-Domain Operations (SPIE-XR)*. 2020.
- [W25] Jon Emmanuel Serrano, Shania Jo Runningrabbit, Sayanti Roy, Alexandra Bejarano, and Tom Williams. “Cognitive Architectural Control for Free-Flying Robots on the Lunar Orbital Platform-Gateway”. In: *Workshop on Human-Robot Interaction for Space Robotics at the 12th International Conference on Social Robotics*. 2020.
- [W26] Adam Stogsdill, Thao Phung, and Tom Williams. “Investigating Confidence-Based Category Transition of Spatial Gestures”. In: *2nd Workshop on Natural Language Generation for Human-Robot Interaction at HRI 2020*. 2020.
- [W27] Nhan Tran, Kai Mizuno, Trevor Grant, Thao Phung, Leanne Hirshfield, and Tom Williams. “Exploring Mixed Reality Robot Communication Under Different Types of Cognitive Load”. In: *Proceedings of the 3rd International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2020.
- [W28] Ruchen Wen, Mohammed Aun Siddiqui, and Tom Williams. “Poster: Dempster-Shafer Theoretic Learning of Indirect Speech Act Comprehension Norms”. In: *Advances in Cognitive Systems*. Non-archival Poster Presentation. 2020.
- [W29] Tom Williams, Daniel Ayers, Camille Kaufman, Jon Emmanuel Serrano, Shania Jo Runningrabbit, Sayanti Roy, Poulomi Pal, and Alexandra Bejarano. “Identity Performance in Multi-Robot Distributed Systems”. In: *Workshop on Human-Robot Interaction for Space Robotics at the 12th International Conference on Social Robotics*. 2020.
- [W30] Tom Williams, Leanne Hirshfield, Nhan Tran, Trevor Grant, and Nicholas Woodward. “Using Augmented Reality to Better Study Human-Robot Interaction”. In: *Proceedings of the 12th International Conference on Virtual, Augmented, and Mixed Reality (VAMR)*. 2020.
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- [W31] Tom Williams, Torin Johnson, Will Culpepper, and Kellyn Larson. “Toward Forgetting-Sensitive Referring Expression Generation for Integrated Robot Architectures”. In: *Advances in Cognitive Systems*. Non-archival Poster Presentation. 2020.
- [W32] Nicholas Woodward, Teresa Nguyen, Lixiao Zhu, Carter Fowler, Taewoo Kim, Stacia Near, Stephen Thoemmes, and Tom Williams. “Exploring Interaction Design Considerations for Trustworthy Language-Capable Robotic Wheelchairs in Virtual Reality”. In: *Proceedings of the 3rd International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2020.
- [W33] Ryan Blake Jackson and Tom Williams. “On Perceiving Robots as Social and Moral Agents”. In: *Proceedings of the 2019 HRI Workshop on the Dark Side of Human-Robot Interaction*. 2019.
- [W34] Ruchen Wen, Ryan Blake Jackson, Tom Williams, and Qin Zhu. “Towards A Role Ethics Approach to Command Rejection”. In: *Proceedings of the 2019 HRI Workshop on the Dark Side of Human-Robot Interaction*. 2019.
- [W35] Tom Williams, Matthew Bussing, Sebastian Cabrol, and Ian Lau. “Toward Allocentric Mixed-Reality Deictic Gesture”. In: *Proceedings of the 2st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2019.
- [W36] Tom Williams, Matthew Bussing, Sebastian Cabrol, Ian Lau, Elizabeth Boyle, and Nhan Tran. “Investigating the Potential Effectiveness of Allocentric Mixed Reality Deictic Gesture”. In: *Proceedings of the 11th International Conference on Virtual, Augmented, and Mixed Reality (VAMR)*. 2019.
- [W37] Tom Williams, Daniel Szafir, and Tathagata Chakraborti. “The Reality-Virtuality Interaction Cube”. In: *Proceedings of the 2st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2019.
- [W38] Qin Zhu, Tom Williams, and Ruchen Wen. “Confucian Robot Ethics”. In: *Computer Ethics - Philosophical Enquiry*. 2019.
- [W39] Maxwell Bennett, Tom Williams, Daria Thames, and Matthias Scheutz. “Investigating Interactions with Teleoperated and Autonomous Humanoids Using a Suit-Based VR Teleoperation Interface”. In: *Proceedings of the 1st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2018.
- [W40] Leanne Hirshfield, Tom Williams, Natalie Sommer, Trevor Grant, and Senem Velipasalar Gursoy. “Workload-Driven Modulation of Mixed-Reality Robot-Human Communication”. In: *Workshop on Modeling Cognitive Processes from Multimodal Data at the International Conference on Multimodal Interaction*. 2018.
- [W41] Nahn Tran, Josh Rands, and Tom Williams. “A Hands-Free Virtual-Reality Teleoperation Interface for Wizard-of-Oz Control”. In: *Proceedings of the 1st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2018.
- [W42] Tom Williams. “Who Should I Run Over?": Long-Term Ethical Implications of Natural Language Generation”. In: *Proceedings of the 2018 HRI Workshop on Longitudinal Human-Robot Teaming*. 2018.
- [W43] Tom Williams. “A Framework for Robot-Generated Mixed-Reality Deixis”. In: *Proceedings of the 1st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*. 2018.
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- [W44] Tom Williams, Evan Krause, Bradley Oosterveld, and Matthias Scheutz. “Towards Givenness and Relevance-Theoretic Open World Reference Resolution”. In: *Proceedings of the Robotics: Science and Systems Workshop on Models and Representations for Natural Human-Robot Communication*. 2018.
- [W45] Tom Williams, Nhan Tran, Josh Rands, and Neil T. Dantam. “Augmented, Mixed, and Virtual Reality Enabling of Robot Deixis”. In: *Proceedings of the 10th International Conference on Virtual, Augmented, and Mixed Reality (VAMR)*. 2018.
- [W46] Qin Zhu, Tom Williams, and Blake Jackson. “Blame-Laden Moral Rebukes and the Morally Competent Robot: A Confucian Ethical Perspective”. In: *Proceedings of the Workshop on Brain-Based and Artificial Intelligence*. 2018.
- [W47] Lars Kunze, Tom Williams, Nick Hawes, and Matthias Scheutz. “Spatial Referring Expression Generation for HRI: Algorithms and Evaluation Framework”. In: *Proceedings of the AAAI Fall Symposium on AI for HRI (AI-HRI)*. 2017.
- [W48] Tom Williams and Matthias Scheutz. “Referring Expression Generation Under Uncertainty in Integrated Robot Architectures”. In: *Proceedings of the Robotics: Science and Systems Workshop on Human-Centered Robotics: Interaction, Physiological Integration and Autonomy*. 2017.
- [W49] Tom Williams and Matthias Scheutz. “Resolution of Referential Ambiguity Using Dempster-Shafer Theoretic Pragmatics”. In: *Proceedings of the AAAI Fall Symposium on AI for HRI (AI-HRI)*. 2016.
- [W50] Tom Williams, Stephanie Schreitter, Saurav Acharya, and Matthias Scheutz. “Towards Situated Open-World Reference Resolution”. In: *Proceedings of the AAAI Fall Symposium on AI for HRI (AI-HRI)*. 2015.
- [W51] Matthias Scheutz, Gordon Briggs, Rehj Cantrell, Evan Krause, Tom Williams, and Richard Veale. “Novel Mechanisms for Natural Human-Robot Interactions in the DIARC Architecture”. In: *Proceedings of the 2013 AAAI Workshop on Intelligent Robotic Systems*. 2013.

Doctoral Consortia

- [DC1] Rafael Sousa Silva and Tom Williams. “Enabling Human-like Language-Capable Robots Through Working Memory Modeling”. In: *Proceedings of the 13th Pioneers Workshop at HRI 2023*. 2023.
- [DC2] Alexandra Bejarano and Tom Williams. “Understanding and Influencing User Mental Models of Robot Identity”. In: *Proceedings of the 13th Pioneers Workshop at HRI 2022*. 2022.
- [DC3] Terran Mott and Tom Williams. “Community-Situated Mixed-Methods Robotics Research for Children and Childhood Spaces”. In: *Proceedings of the 13th Pioneers Workshop at HRI 2022*. 2022.
- [DC4] Tom Williams. “Architectural Mechanisms for Situated Natural Language Understanding in Uncertain and Open Worlds”. In: *Proceedings of the 2016 AAAI Doctoral Consortium*. 38% acceptance rate, 2016.
- [DC5] Tom Williams. “Towards More Natural Human-Robot Dialogue”. In: *Proceedings of the 6th Pioneers Workshop at HRI 2015*. 2015.
- [DC6] Tom Williams. “Position Paper”. In: *Proceedings of the 10th Young Researchers’ Roundtable on Spoken Dialog Systems*. 2014.
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Theses

- [T1] Tom Williams. “Situated Natural Language Interaction in Uncertain and Open Worlds”. PhD thesis. Tufts University, 2017.

Other Publications

- [O1] Terran Mott and Tom Williams. “Rube-Goldberg Machines, Transparent Technology, and the Morally Competent Robot”. In: *Companion Proceedings of the ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2023.
- [O2] Saad Elbeleidy, Aryaman Jadhav, Dan Liu, and Tom Williams. “Robot Teleoperation Interfaces for Customized Therapy for Autistic Children”. In: *Companion Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction: Late Breaking Reports*. 2022.
- [O3] Zhao Han and Tom Williams. “A Task Design for Studying Referring Behaviors for Linguistic HRI”. In: *Companion Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction: Late Breaking Reports*. 2022.
- [O4] Santosh Balajee Banisetty and Tom Williams. “Implicit Communication Through Social Distancing: Can Social Navigation Communicate Social Norms?” In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O5] Alexandra Bejarano, Olivia Lomax, Peyton Scherschel, and Tom Williams. “Designing for Perceived Robot Empathy for Children in Long-Term Care”. In: *International Conference on Social Robotics*. 2021.
- [O6] Saad Elbeleidy, Aubrey Shick, and Tom Williams. “Teleoperation Interface Usage in Robot-Assisted Childhood ASD Therapy”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O7] Chloe McCaffrey, Alexander Taylor, Sayanti Roy, Santosh Balajee Banisetty, Tom Williams, and Ross Mead. “Can Robots Be Used to Encourage Social Distancing?” In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O8] Terran Mott, Joslyne Lovelace, and Bennett Steward. “Design Considerations for Child-Robot Interaction in Pediatric Contexts”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O9] Adam Stogsdill, Grace Clark, Aly Ranucci, Thao Phung, and Tom Williams. “Is it Pointless? Modeling and Evaluation of Category Transitions of Spatial Gestures”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O10] Nhan Tran, Trevor Grant, Thao Phung, Leanne Hirshfield, Christopher Wickens, and Tom Williams. “Get This! Mixed Reality Improves Robot Communication Regardless of Mental Workload”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O11] Nhan Tran, Trevor Grant, Thao Phung, Leanne Hirshfield, Christopher Wickens, and Tom Williams. “Robot-generated Mixed Reality Gestures Improve Human-Robot Interaction”. In: *International Conference on Social Robotics*. 2021.
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- [O12] Ruchen Wen, Boyoung Kim, Elizabeth Phillips, Qin Zhu, and Tom Williams. “Comparing Strategies for Robot Communication of Role-Grounded Moral Norms”. In: *Companion Proceedings of the 16th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2021.
- [O13] Ethan Perry, Alexandra Pollock, and Tom Williams. “The Influence of Social Embarrassment on Engagement with Publicly Displayed Digital Content”. In: *Posters of the International Conference on Human-Computer Interaction (HCII)*. 2020.
- [O14] Aaron Adler, Prithviraj Dasgupta, Nick DePalma, Mohammed Eslami, Richard G. Freedman, John E. Laird, Christian Lebiere, Katrin Lohan, Ross Mead, Mark Roberts, Paul S. Rosenbloom, Emmanuel Senft, Frank Stein, Tom Williams, Kyle Hollins Wray, Fusun Yuman, and Shlomo Zilberstein. “Reports on the 2018 AAAI Fall Symposium Series”. In: *AI Magazine* 40.2 (2019), pp. 66–72.
- [O15] Tom Williams, Daniel Szafr, and Tathagata Chakraborti. “The Reality-Virtuality Interaction Cube: A Framework for Conceptualizing Mixed-Reality Interaction Design Elements for HRI”. In: *Late Breaking Reports of the 14th ACM/IEEE International Conference on Human-Robot Interaction*. 2019.
- [O16] Neil T. Dantam, Tom Williams, and Hao Zhang. “Combinatorial Inference of Multi-modal Observations”. In: *Extended Abstracts of the IEEE/RSJ International Conference on Robotics and Automation (ICRA)*. 2018.
- [O17] Ryan Blake Jackson and Tom Williams. “Challenges in Responding to Malicious Robot-Directed Commands”. In: *Extended Abstracts of the Robotics: Science and Systems Workshop on Adversarial Robotics*. 2018.
- [O18] Tom Williams. “Toward Ethical Natural Language Generation for Human-Robot Interaction”. In: *Companion Proceedings of the 13th ACM/IEEE International Conference on Human-Robot Interaction (HRI): Late Breaking Reports*. 2018.
- [O19] Tom Williams, Evan Krause, Bradley Oosterveld, Ravenna Thielstrom, and Matthias Scheutz. “Towards Robot Knowledge Consultants Augmented with Distributed Short Term Memory”. In: *Extended Abstracts of the Robotics: Science and Systems Workshop on Models and Representations for Natural Human-Robot Communication*. 2018.
- [O20] Tom Williams, Daniel Szafr, Tathagata Chakraborti, and Heni Ben Amor. “The 1st International Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction”. In: *AI Magazine* 39.4 (2018), pp. 64–66.
- [O21] Tom Williams, Daniel Szafr, Tathagata Chakraborti, and Heni Ben Amor. “Virtual, Augmented, and Mixed Reality for Human-Robot Interaction”. In: *Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction*. ACM. 2018, pp. 403–404.
- [O22] Patricia Alves-Oliveira, Richard G Freedman, Dan Grollman, Laura Herlant, Laura Humphrey, Fei Liu, Ross Mead, Frank Stein, Tom Williams, and Shomir Wilson. “Reports on the 2016 AAAI Fall Symposium Series”. In: *AI Magazine* 38.2 (2017), pp. 86–90.
- [O23] Eric Eaton, Sven Koenig, Claudia Schulz, Francesco Maurelli, John Lee, Joshua Eckroth, Mark Crowley, Richard Freedman, Rogelio Cardona-Rivera, Tiago Machado, and Tom Williams. “Blue Sky Ideas in Artificial Intelligence Education from the EAAI ’17 New and Future AI Educator Program”. In: *Educational Advances in Artificial Intelligence*. 2017.
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- [O24] Tom Williams. “Dissertation Briefing: Situated Natural Language Interaction in Uncertain and Open Worlds”. In: *AI Matters*. 2017.
- [O25] Tom Williams, Stephanie Schreitter, Saurav Acharya, and Matthias Scheutz. “Towards Situated Open World Reference Resolution”. In: *Late Breaking Papers at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2015.
- [O26] Stuart Hirshfield, Colden Prime, and Tom Williams. *A Next-Generation Model for Live Cyber Forensics*. Tech. rep. Rome, NY: AFRL Rome Laboratory, Aug. 2008.
- [O27] Stuart Hirshfield, Colden Prime, and Tom Williams. *A New Model for Live Cyber-Forensics*. Tech. rep. Rome, NY: AFRL Rome Laboratory, Aug. 2007.

Research Grants and Gifts

Federal Grants

- 2022 **Developing a Quantification System for Robot Moral Agency**, *AFOSR*, Investigators: Thomas Williams (PI), Elizabeth Phillips, Boyoung Kim, Qin Zhu, Amount: \$23,313 (\$399,107 total).
- 2022 **Dynamic, Adaptive Interfaces for Team-Level Goal Specification**, *ARL*, Investigators: Thomas Williams (PI), Neil Dantam, Amount: \$300,000.
- 2022 **SMART: Stealth Maneuver for Adversarial Robot Teams by Context-Aware Bi-Level Learning**, *ARL*, Investigators: Thomas Williams (PI), Hao Zhang, Christopher Reardon, Amount: \$300,001.
- 2021 **Givenness Hierarchy Theoretic Natural Language Generation for Situated Human-Robot Interaction**, *ONR*, Investigators: Thomas Williams (PI), Hao Zhang, Neil Dantam, Amount: \$828,971.
- 2021 **CAREER: Cognitively-Informed Memory Models for Language-Capable Robots**, *NSF*, Investigators: Thomas Williams (PI), Amount: \$549,999.
- 2019 **Examining the Impact of Augmented Reality-based Information Communication**, *ARL*, Investigators: Hao Zhang (PI), Thomas Williams (Co-PI), Amount: \$100,744.
- 2019 **Young Investigator Award: Calibrated Norm Violation Response in Human-Machine Teaming**, *AFOSR*, Investigators: Thomas Williams (PI), Amount: \$445,000.
NOTE: We have also been given two additional awards by our PO to supplement this grant. A \$25,000 supplement to extend our work in new directions, and a \$10,166 ISEP award to support PhD student Terran Mott to pursue research in Sweden in Summer 2022.
- 2019 **Early Career Faculty: Performance of Autonomy and Identity for Trust- and Workload-Sensitive Interaction with Distributed Autonomous Systems**, *NASA*, Investigators: Thomas Williams (PI), Amount: \$599,296.
- 2019 **Engineering Online Learning Pathways in Advanced Manufacturing and Data Science**, *National Science Foundation*, Investigators: Samuel Spiegel (PI), Jennifer Blacklock, Craig Brice, Thomas Williams, Sebnem Duzgun, Whitney Trainor-Guitton, Wendy Fisher, Branden Kappes, Amount: \$1,999,802.
- 2019 **CHS: SMALL: APERTURE: Augmented Reality and Physio-Enhanced Robotic Gesture**, *National Science Foundation*, Investigators: Thomas Williams (PI), Leanne Hirshfield, Amount: \$257,349 (\$498,349 total).
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- 2019 **REU Supplement: CHS: SMALL: APERTURE: Augmented Reality and Physio-Enhanced Robotic Gesture**, *National Science Foundation*, Investigators: Thomas Williams (PI), Leanne Hirshfield, Amount: \$16,000.
- 2019 **CHS: SMALL: Collaborative Research: Role-Based Norm Violation Response in Human-Robot Teams**, *National Science Foundation*, Investigators: Thomas Williams (PI), Qin Zhu, Chad Tossell, Elizabeth Phillips, Ewart de Visser, Amount: \$250,502 (\$499,967 total).
- 2019 **S&AS: FND: Context-Aware Ethical Autonomy for Language Capable Robots**, *National Science Foundation*, Investigators: Thomas Williams (PI), Hao Zhang, Neil Dantam, Amount: \$570,000.
- 2018 **CRI: II-New: Infrastructure for Robust Interactive Underground Robots**, *National Science Foundation*, Investigators: Thomas Williams (PI), Qi Han, Hao Zhang, Neil T. Dantam, Amount: \$451,102.
- 2018 **Prediction of Human Emotional and Cognitive States by Machine Agents to Promote Shared Situational Awareness**, *USAF A*, Investigators: Hao Zhang (PI), Thomas Williams, Amount: \$74,943.

Corporate Grants

- 2020 **exploreCSR Grant**, *Google*, Investigators: William Hoff (PI), Tracy Camp, Dorothy Cheng, Christine Liebe, Molly McAndrew, Andrea Salazar Morgan, Thomas Williams, Amount: \$18,000.

Institutional Grants and Awards

- 2022 **Tech Fee CS-03b: Educational Robots for Interactive Robotics Courses**, *Colorado School of Mines*, Investigators: Thomas Williams (PI), Amount: \$31,500.
- 2020 **Using Robots To Encourage Social Distancing**, *Colorado School of Mines*, Investigators: Thomas Williams (PI), Santosh Banisetty, Sayanti Roy, Amount: \$1,170.
- 2020 **Daniels Fund Faculty Fellowship**, *Colorado School of Mines*, Investigators: Thomas Williams (PI), Amount: \$5,000.
- 2020 **Tech Fee CS-12: Educational Robots for Interactive Robotics Courses**, *Colorado School of Mines*, Investigators: Thomas Williams (PI), Amount: \$27,000.
- 2019 **Tech Fee CS-03: Educational Robots for Interactive Robotics Courses**, *Colorado School of Mines*, Investigators: Thomas Williams (PI), Amount: \$25,500.
- 2018 **Tech Fee CS-01: Educational Robots for CS-ME Teaching Lab**, *Colorado School of Mines*, Investigators: Neil Dantam (PI), Kevin Moore, Andrew Petruska, Thomas Williams, Hao Zhang, Xiaoli Zhang, Amount: \$56,200.

Selected Press Coverage

Heise Online, 2023.

Outreach covered in “Roboterkonferenz HRI: Robotikforscher verweigern Zusammenarbeit mit der Polizei”

IT World Canada, 2022.

Outreach covered in “Law needed requiring AI to be fair, accountable and transparent”

Mines Newsroom, 2022.

Research covered in “Faculty Awards honor 9 Mines professors for teaching, research, mentorship”

Heise Online, 2022.

Research covered in “Human Robot Interaction: Wie feministisch müssen Roboter sein?”

Mines Engage, 2021.

Research covered in “My lab is exploring how teleoperated robots can help therapists work with children on the autism spectrum”

Washington Post, 2021.

Opinion sought for “Robot vacuums are learning to avoid dog poop. But that’s not all they can see”

Because Hamiltonians, 2021.

Research covered in “Because Hamiltonians Talk to Robots”

Answer in Progress, 2021.

Featured Interviewee for YouTube Science show “Answer in Progress” episodes “*I taught an AI to solve the Trolley Problem*” (>1,340,000 views) and “*A Chat with Dr. Tom Williams*”
<https://youtu.be/181Nj060xMQ>

The Conveyor Podcast, 2021, Episode 106.

Featured Guest: “Learning How to Communicate and Interact with Humans”

Utica Observer Dispatch, 2021.

CAREER Award Covered

Mines Newsroom, 2021.

Award Interview for “Tom Williams wins NSF CAREER Award to improve robotic communication skills”

Mines Magazine, 2021.

Teaching and Outreach covered in “Building Bots to Benefit All ”

New York Times, 2020.

Opinion sought and outreach covered in “Can We Make Our Robots Less Biased Than Us?”

Robohub, 2020.

Outreach covered in “Conversation on racism and robotics”

VentureBeat, 2020.

Outreach covered in “Black roboticists on racism, bias, and building better AI”

TechXplore, 2020.

Research covered in “A statistical model of cognitive status for natural language generation”

IEEE Robotics and Automation Society Soft Robotics Podcast, 2020.

Featured Guest: “Tom Williams: No Justice, No Robots!”

Radical AI Podcast, 2020, Episode 001.

Featured Guest: “Can a Machine Ever be Moral? Robot Politeness and Persuasion with Tom Williams”

<https://youtu.be/BMOY7I-rKTM>

Mines Newsroom, 2020.

Award Interview for “Improving the human-robot relationship, one successful conversation at a time”

Dayton Daily News, 2019.

Award covered in “42 scientists, engineers receive Young Investigator Research grants”

Robins Air Force Base, 2019.

Award covered in “Air Force awards grants to 40 scientists and engineers through young investigator research program”

Mines Newsroom, 2018.

Award Interview for “Edgar Mine to serve as lab for underground robotics research”

Denver Post, 2018.

Opinion sought for “Boulder’s Misty Robotics unveils its first personal robot, but not just anyone can buy it”

IEEE Spectrum, 2018.

Research covered in “How Not to Order Water from a Robot Waiter”

The Next Web, 2018.

Research covered in “Robots would prefer you to be rude”

Talks

Invited Talks

Colloquium Speaker, April 2023.

University of Nevada Reno, Reno, NV

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Colloquium Speaker, March 2023.

Uppsala University, Uppsala, SE

“(Who?), Robot”

Panel Speaker, March 2023.

Workshop on The Imperfectly Relatable Robot: An interdisciplinary workshop on the role of failure in HRI

Panel Speaker, March 2023.

Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)

Invited Speaker and Discussion Leader, February 2023.

AFOSR Workshop on AI Ethics, Arlington, VA

“A Lightning Tour of AI (Robot) Ethics”

Colloquium Speaker, February 2023.

Utrecht University Lecture Series on Embodied AI: Virtual Humans and Social Robots, Utrecht, NL

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Panel Speaker, November 2022.

AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction

Panel on AI-HRI as a Conference?

Colloquium Speaker, November 2022.

Harvey Mudd College, Claremont, CA

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Colloquium Speaker, May 2022.

NASA Ames Research Center, Mountain View, CA

“Making Sense of How Users Make Sense of Robots: Applications to Human-Robot Teaming in Space Environments”

Short Course Speaker, April 2022.

ASCE Earth and Space 2022

“Making Sense of How Users Make Sense of Robots: Applications to Human-Robot Teaming in Space Environments”

Colloquium Speaker, April 2022.

University of Colorado, Boulder, CO

“A Multi-Disciplinary Approach to Teaming, Teaching, and Learning with Intelligent, Interactive Agents”

Colloquium Speaker, April 2022.

Clemson University, Clemson, SC

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Colloquium Speaker, February 2022.

Institute for Cognitive Science, University of Colorado, Boulder, CO

“Representation and Identity: Opportunities and Challenges for Language-Capable Robots”

Keynote Speaker, November 2021.AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction
Bullfighting<https://youtu.be/h2-W0C9ivn8>**Colloquium Speaker, November 2021.**

University of Wisconsin, Madison, WI

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

<https://youtu.be/1fkC0cv-MpQ>**Panel Speaker, November 2021.**AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction
Panel on Future of AI-HRI**Colloquium Speaker, October 2021.**

Atlas Institute, University of Colorado, Boulder, CO

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

<https://youtu.be/meDCzZFjWD4>**Invited Speaker, October 2021.**

IEEE Denver Computer, Information Theory, and Robotics Society

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Invited Speaker, September 2020.

European Conference on Artificial Intelligence (ECAI) Workshop on Artificial and Human Intelligence: Formal and Cognitive Foundations for Human-Centred Computing

“Robotics in Context”

Panel Speaker, August 2020.

Advances in Cognitive Systems

“How to prepare the next generation of cognitive systems researchers?”

Panel Speaker, July 2020.

Robotics: Systems and Science

“Future of Robotics Panel (Hosted by Inclusion@RSS)”

Colloquium Speaker, February 2020.

University of Washington, Seattle, WA

“Pierre Menard and the Mechanical Bull”

Panel Speaker, February 2020.

Association for the Advancement of Artificial Intelligence (AAAI) Undergraduate Consortium

“AMA about AI Research / Grad School”

Colloquium Speaker, *November 2019.*

University of Rochester, Rochester, NY
“Pierre Menard and the Mechanical Bull”

Colloquium Speaker, *August 2019.*

University of Miami, Miami, FL
“COME TO THIS TALK, HUMANS”

Colloquium Speaker, *April 2019.*

Colorado College, Colorado Springs, CO
“COME TO THIS TALK, HUMANS”

Invited Speaker, *August 2018.*

IEEE RO-MAN Workshop on Human Robot Interaction: From Service to Industry (HRI-SI 2018),
Nanjing, China
“New Directions for Reference in Robotics”

Colloquium Speaker, *June 2018.*

Misty Robotics, Boulder, CO
“Expanding the Frontiers of Reference in Robotics”

Panel Speaker, *March 2018.*

1st International Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interac-
tion, Chicago, IL
“Virtual, Augmented and Mixed Reality in Robotics: Progress, Opportunities, Challenges”

Colloquium Speaker, *March 2018.*

University of Alabama, Tuscaloosa, AL
“Natural Language Pragmatics and Human-Robot Interaction: Empirical, Algorithmic, and Ethical
Dimensions”

Colloquium Speaker, *February 2018.*

Mississippi State University, Mississippi State, MS
“Natural Language Pragmatics and Human-Robot Interaction: Empirical, Algorithmic, and Ethical
Dimensions”

Panel Speaker, *November 2017.*

Tufts University, Medford, MA
“President’s Council Panel on Student Research”

JHRI Session Invited Speaker, *March 2017.*

ACM/IEEE International Conference on Human-Robot Interaction, Vienna, Austria
“Covert Robot-Robot Communication: Human Perceptions and Implications for Human-Robot
Interaction”

Colloquium Speaker, *April 2017.*

MIT Lincoln Laboratory, Lexington, MA
“A Tale of Two Architectures: A Dual-Citizenship Integration of Natural Language and the
Cognitive Map”

Colloquium Speaker, *April 2017.*

University of Massachusetts Amherst, Amherst, MA
“Genuine Helpers: Enabling Natural Language Capabilities for Interactive Robots”

Colloquium Speaker, *July 2016.*

MITRE Corporation, Bedford, MA
“Against Robot Telepathy: the Why and How of Verbal Robot-Robot Communication”

[Other Seminars](#)

Research Council Invited Speaker, April 2023.

Colorado School of Mines

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Seminar Speaker, December 2022, Department of Computer Science Bridge Program.

Colorado School of Mines, Golden, CO

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Colloquium Speaker, April 2021, Department of Computer Science.

Colorado School of Mines, Golden, CO

“Secret Agents: The Real and Imagined Lives of Interactive Robots”

Invited Speaker, April 2021, University Innovation Fellows.

Colorado School of Mines, Golden, CO

“Pierre Menard and the Mechanical Bull”

Invited Speaker, January 2021, Mines Alumni Foundation “Third Thursday” Series.

Colorado School of Mines, Golden, CO

“Robotics in Context”

Colloquium Speaker, October 2020, ACM-W Chapter.

Colorado School of Mines, Golden, CO

“Pierre Menard and the Mechanical Bull”

Colloquium Speaker, January 2020, Quantitative Biosciences and Bioengineering Program.

Colorado School of Mines, Golden, CO

“Pierre Menard and the Mechanical Bull”

Colloquium Speaker, October 2019, Department of Humanities, Arts, and Social Sciences.

Colorado School of Mines, Golden, CO

“Blame-laden moral rebukes and the morally competent robot: A Confucian ethical perspective”

Lab Seminar Speaker, May 2018.

Human Robot Interaction Lab, Tufts University, Medford, MA

“Tutorial: Consultant Framework, POWER, and PIA”

Lab Seminar Speaker, April 2018.

United States Air Force Academy, Colorado Springs, CO

“Expanding the Frontiers of Reference in Robotics”

Lab Seminar Speaker, June 2016.

Intitute for Artificial Intelligence, Universität Bremen, Bremen, Germany

“Natural Language Understanding for Human-Robot Interaction”

Professional Service

Steering Committee Membership

Human-Robot Interaction Steering Committee 2021-2024

Conference Organization

Program Committee Co-Chair.

ACM/IEEE International Conference on Human-Robot Interaction (HRI) 2024

International Conference on Social Robotics (ICSR) 2020

Publications Chair.

International Conference on Human-Robot Interaction (HRI) 2020

Local Arrangements Chair.

International Conference on Human-Robot Interaction (HRI) 2021

Local Meetup Co-Chair.

International Conference on Human-Robot Interaction (HRI) 2022, Denver Meetup

Social Media Chair.

Advances in Cognitive Systems (ACS) 2020

Program Board.

Virtual, Augmented, and Mixed Reality (VAMR) 2019, 2018

Session Chair.

Virtual, Augmented, and Mixed Reality (VAMR) 2019, Paper Session Organizer and Chair: Augmented Reality for Human-Robot Interaction

Virtual, Augmented, and Mixed Reality (VAMR) 2018, Paper Session Chair: Virtual reality in Psychotherapy and Mental Health

Symposium on Educational Advances in Artificial Intelligence (EAAI) 2018, Special Track Organizer and Chair: Best Practices for Running an AI Research Group

AAAI Conference on Artificial Intelligence (AAAI) 2018, Paper Session Chair: Language and Learning

Workshop and Symposium Organization**Workshop, *Perspectives on Moral Agency in Human-Robot Interaction.***

Co-organizers: Boyoung Kim (GMU), Elizabeth Phillips (GMU), Qin Zhu (VT). *International Conference on Human-Robot Interaction, held in Stockholm, Sweden in March 2023*

Workshop, *Pedagogical Advances in Cognitive Systems*, Lead Organizer.

International Conference on Advances in Cognitive Systems, held online in November 2022

Workshop, *SLIVAR Workshop*, Organizer of Discussion Series on The Ethics of Robotic Natural Language Processing.

Held February-April 2022

Workshop, *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*, Steering Committee Member.

Co-organizers: Christine Chang (CU Boulder), Michael Walker (CU Boulder), Jessica Zosa-Forde (Brown), Thomas Groechel (USC), Eric Rosen (Brown), Dan Szafr (CU Boulder), Stefanie Tellex (Brown). *International Conference on Human-Robot Interaction, to be held online in March 2022*

Workshop, *Pedagogical Advances in Cognitive Systems*, Lead Organizer.

International Conference on Advances in Cognitive Systems, held online in November 2021

Workshop, *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*, Steering Committee Member.

Co-organizers: Eric Rosen (Brown), Thomas Groechel (USC), Christine Chang (CU Boulder), Michael Walker (CU Boulder), Jessica Zosa-Forde (Brown), Dan Szafr (CU Boulder), Tathagata Chakraborti (ASU). *International Conference on Human-Robot Interaction, held online in March 2021*

Workshop, *ICSR Workshop on Human-Robot Interaction for Space Robotics (HRI-SR)*.

Co-organizers: Sayanti Roy (Mines), Nakul Gopalan (Georgia Tech), Matthew Gombolay (Georgia Tech), Thomas Howard (U of Rochester), Dan Szafr (CU Boulder), Terry Fong (NASA). *International Conference on Social Robotics, held online in November 2020*

Workshop, *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*, Lead Organizer.

Co-organizers: Dan Szafr (CU Boulder), Tathagata Chakraborti (ASU), Eric Rosen (Brown), Serena Booth (MIT), Ong Soh Khim (NUS), Thomas Groechel (USC). *International Conference on Human-Robot Interaction, held online in August 2020*

Workshop, *The Dark Side of Human-Robot Interaction: Ethical Considerations and Community Guidelines for the Field of HRI*.

Co-organizers: Kerstin Haring (USAFA), Michael Novitzky (MIT), Paul Robinette (MIT), Ewart de Visser (USAFA), Allan Wagner (Penn State). *International Conference on Human-Robot Interaction, held in Daegu, Korea, in March 2019*

Workshop, *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*, Lead Organizer.

Co-organizers: Dan Szafr (CU Boulder), Tathagata Chakraborti (ASU), Elizabeth Phillips (USAFA). *International Conference on Human-Robot Interaction, held in Daegu, Korea, in March 2019*

Workshop, *Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI)*, Lead Organizer.

Co-organizers: Dan Szafr (CU Boulder), Tathagata Chakraborti (ASU), Heni Ben-Amor (ASU). *International Conference on Human-Robot Interaction, held in Chicago, IL, in March 2018*

Symposium, *Interactive Learning in Artificial Intelligence for Human-Robot Interaction (AI-HRI)*, Finance Chair.

Co-organizers: Kalesha Bullard (Georgia Tech), Nick de Palma (FutureWei Technologies), Richard G. Freedman (UMass Amherst / SIFT), Bradley Hayes (CU Boulder), Luca Iocchi (Sapienza), Katrin Lohan (Heriot-Watt), Ross Mead (Semio), Emmanuel Senft (Plymouth U). *AAAI Fall Symposium, held in Arlington, VA, in October 2018*

Symposium, *Artificial Intelligence for Human-Robot Interaction (AI-HRI)*.

Co-organizers: Elin A. Topp (Lund U), Laura M. Hiatt (NRL), Luca Iocchi (Sapienza), Kalesha Bullard (Georgia Tech), Emmanuel Senft (Plymouth U), Tian Zhou (Purdue), Marc Hanheide (U Lincoln), Frank Broz (Heriot-Watt), Dan Grollman (Sphero), Katrin Lohan (Heriot-Watt), Ross Mead (Semio). *AAAI Fall Symposium, held in Arlington, VA, in November 2017*

Symposium, *Artificial Intelligence for Human-Robot Interaction (AI-HRI)*, Program Committee Co-Chair.

Co-organizers: Ross Mead (Semio), Dan Grollman (Sphero), Tiago Ribeiro (U Lisbon), Patricia Alves-Oliveira (U Lisbon), Richard Freedman (UMass Amherst), Nick DePalma (MIT), Gordon Briggs (NRL), Frank Broz (Heriot-Watt), Katrin Lohan (Heriot-Watt), Bradley Hayes (MIT). *AAAI Fall Symposium, held in Arlington, VA, in November 2016*

Workshop, *HRI Pioneers*, Program Committee Co-Chair.

Co-organizers: Jill Greczek (USC), Tiago Ribeiro (U Lisbon), Hee-Tae Jung (UMass Amherst), Sam Spaulding (MIT), Chris Crawford (U Florida), Maria Vanessa aus der Wieschen (U Southern Denmark), Hee Rin Lee (Indiana U), Jung Ju Choi (Ewha Womens U), Igor Zubrycki (Politechnika Lodzka). *International Conference on Human-Robot Interaction, held in Christchurch, New Zealand, in March 2016*

Editorial Work

Associate Editor.

ACM Transactions on Human-Robot Interaction 2021-2022

Review Editor.

Frontiers in Robotics and Artificial Intelligence: Human-Robot Interaction

Program Committee Work

Program Committee Co-Chair.

ACM/IEEE International Conference on Human-Robot Interaction (HRI) 2024

International Conference on Social Robotics (ICSR) 2021, 2020

AAAI Fall Symposium on AI for HRI (AI-HRI) 2016

HRI Pioneers Workshop 2016

Senior Program Committee Member.

AAAI Conference on Artificial Intelligence (AAAI) 2018, 2023

Program Committee Member.

ACL 2019

ACS 2020

AAMAS 2019

AAAI 2020

CORL 2019

EMNLP 2019

EAAI 2021, 2020

HRI 2021, 2023

ICAPS Robotics Track 2019,2018

ICSR 2021, 2020, 2019

Virtual, Augmented, and Mixed Reality 2020, 2019, 2018

HRI Pioneers Workshop 2020,2019,2018,2017

ACL/EMNLP Workshop on NLP and Robotics (ROBO-NLP) 2017

AAAI Fall Symposium on AI for HRI (AI-HRI) 2021, 2018

HRI Workshop on Virtual, Augmented, and Mixed Reality for Human-Robot Interaction (VAM-HRI) 2019

HRI Workshop on The Dark Side of Human-Robot Interaction: Ethical Considerations and Community Guidelines for the Field of HRI 2019

Referee Service

Funding Agency Panelist.

National Science Foundation (NSF)

Air Force Office of Scientific Research (AFOSR)

Referee for Journal Articles.

ACM Computing Surveys

ACM Transactions on Interactive Intelligent Systems

ACM Transactions on Human-Robot Interaction

AI Magazine

Artificial Intelligence

Autonomous Robots

Cognitive Systems Research

Frontiers in Robotics and AI
Interaction Studies
International Journal of Robotics Research
International Journal of Social Robotics
Journal of Autonomous Agents and Multiagent Systems
Journal of Human-Computer Interaction
Journal of Memory and Language
Robotics and Automation Magazine
Robotics and Automation Letters
Sensors
User Modeling and User Adapted Interaction

External Referee for Conference Proceedings.

Advances in Cognitive Systems (ACS)
Annual Conference of the Cognitive Science Society (COGSCI)
ACM Conference on Designing Interactive Systems (DIS)
International Conference on Social Robotics (ICSR)
ACM User Interface Software and Technology Symposium (UIST)
ACM/IEEE International Conference on Human-Robot Interaction (HRI)
Late-Breaking Reports of the ACM/IEEE International Conference on Human-Robot Interaction (HRI)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)
IEEE International Conference on Development and Learning and on Epigenetic Robotics (ICDL-EPIROB)

External Referee for Workshop and Symposia Proceedings.

AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction (AI-HRI)

Referee for Workshop Proposals.

Robotics: Science and Systems (RSS)

[Other Service](#)

Judge, *Elevator Pitch Competition*, ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2022.

Faculty Mentor, *Undergraduate Consortium*, AAAI Conference on Artificial Intelligence (AAAI), 2020-2022.

Faculty Mentor, *Student Program*, AAAI Conference on AI, Ethics, and Society (AIES), 2019.

Puzzle Contributor, “*My Favorite Marvin*”, AI Matters, 2017.

Puzzle Contributor, *Fun and Games Night*, AAAI Conference on Artificial Intelligence (AAAI), 2015.

Professional Society Membership

IEEE RAS, AAAI, ACM, CRA, COGSCI, ASEE, Sigma Xi.

University Service

Justice, Equity, Diversity, and Inclusion (JEDI) Council Chair, 2021-2023
Justice, Equity, Diversity, and Inclusion (JEDI) Council, 2020-2021
Tenure Track Faculty Search Chair, 2019-2020
Tenure Track Faculty Search Member, 2021-2022
Robotics Program Executive Committee, 2020-2022
Board of Student Media, 2017-2019
Bachelor of Science in Engineering: Robotics and Automation Focus Area: Faculty Mentor, 2018-2021
Computer Science: Graduate Student Committee, 2017-2019, 2021-2022
Computer Science: Teaching Faculty Search Committee, 2017-2018
Faculty Liason: Board of Computer Science Graduate Students, 2017-2021
Faculty Advisor: Mines Robotics Club, 2017-2021
CS@Mines Puzzle Challenge 2017-2018

Advising

Current Postdoctoral Advisees

Dr. Zhao Han, 2021–Present

Current Doctoral Advisees

Ruchen Wen, 2018–Present

Terran Mott, 2020–Present

Alexandra Bejarano, 2020–Present

Saad Elbeleidy, 2020–Present

Rafael Silva, 2021–Present

Yifei Zhu, 2022–Present

Mark Higger, 2022–Present

Current Masters Advisees

Shane Romero, 2022–Present

Current Undergraduate MIRRORLab Members

Gabriel del Castillo (Undergraduate, CS), 2022–Present

Cloe Emmett (Undergraduate, CS), 2022–Present

Eric Hansen (Undergraduate, CS), 2022–Present

Annie Huang (Undergraduate, CS), 2022–Present

Aryaman Jadhav (Undergraduate, CS), 2021–Present

Michelle Lieng (Undergraduate, CS), 2022–Present

Zachary Magloughlin (Undergraduate, CS), 2022–Present

Sebastian Negrete-alamillo (Undergraduate, CS), 2022–Present

Alyson Ranucci (Undergraduate, CS), 2020–Present

Polina Rygina (Undergraduate, CS), 2021–Present

Cailyn Smith (Undergraduate, CS), 2021–Present

Daniel Valencia (Undergraduate, CS), 2022–Present

Past Post-Doctoral Advisees

Dr. Sayanti Roy, 2020–2022

Dr. Santosh Banisetty, 2020–2021

Graduated & Past Doctoral and Masters Advisees

Ryan Blake Jackson, 2018–Present. *First Position: Visiting Assistant Professor at Harvey Mudd College, Spring 2022*

Thao Phung (Masters, CS), 2020–Present

Aidan Naughton (Masters Thesis, CS), 2020–2021

Poulomi Pal (Masters Thesis, CS), 2019–2021

Joss Chapman (Masters, CS), 2020–2020

Nhan Tran (Masters Thesis, CS), 2018–2020, *Research Engineer, Robust.AI*

Lixiao Zhu (Masters Thesis, CS), 2019–2020, *PhD Student, McGill University, Fall 2021*

Kellyn Larson (Masters, CS), 2018–2019

Emil Muly, 2021–2022

Stacia Near (Masters, CS), 2017–2019

Jane Lockshin (Masters, CS) 2018–2019, *Researcher, National Renewable Energy Laboratory*

Jose Perez Rodriguez (Masters, CS) 2019–2019

Graduated & Past Non-Advisee Graduate MIRRORLab Members

Mingyuan Han (Masters, PE), 2018–2019

Aun Siddiqui (Masters, MechE), 2017–2019, *Machine Learning Engineer, Terra Chem Laboratory*

Prasanth Sengadu Suresh (Masters, MechE), 2017–2018, *PhD Student, University of Georgia*

Akshay Swaminathan (Masters, CS), 2017–2018, *Software Engineer, Plus One Robotics*

Graduated & Past Advisees (Undergraduate)

Katherine Aubert (Undergraduate, CS), 2020–2021

Daniel Ayers (Undergraduate, CS), 2020–2021

Brandon Barton (Undergraduate, CS), 2021–2021

Tommy Bennett (Undergraduate, CS), 2018–2020

Luke Beukelman (Undergraduate, CS), 2021–2022

Elizabeth Boyle (Undergraduate, CS), 2018–2019

Landon Brown (Undergraduate, CS), 2020–2022

Matthew Bussing (Undergraduate, CS), 2017–2019

Sebastian Cabrol (Undergraduate, CS), 2018–2019

Amia Castro (Undergraduate, CS), 2021–2022

Grace Clark (Undergraduate, CS), 2020–2022

Morgan Cox (Undergraduate, CS), 2019–2020
Will Culpepper (Undergraduate, CS), 2019–2022
Kate Deal (Undergraduate, CS), 2021–2022
Adrian Estrada (Undergraduate, CS), 2019–2020
Sebastian Faure (Undergraduate, CS, University of Florida), 2021–2022
Ryan Fite (Undergraduate, CS), 2017–2019
Carter Fowler (Undergraduate, CS), 2018–2020
Andrea Golden-Lasher (Undergraduate, CS), 2019–2019
Jared Hamilton (Undergraduate, CS), 2019–2021
Torin Johnson (Undergraduate, CS), 2019–2021
Taewoo Kim (Undergraduate, CS), 2018–2019
Camille J. Kaufman (Undergraduate, CS), 2020–2022
Ian Lau (Undergraduate, CS), 2018–2019
Alex Leto (Undergraduate, CS), 2019–2020
Kai Mizuno (Undergraduate, CS), 2019–2019
Teresa Nguyen (Undergraduate, CS), 2018–2020
Levi Ortega (undergraduate, CS), 2019–2020
Ethan Perry (Undergraduate, CS), 2020–2020
Albert Phan (Undergraduate, CS), 2020–2022
Alexandra Pollock (Undergraduate, CS), 2020–2020
Daniel Rosen (Undergraduate, CS), 2021–2022
Shania Jo RunningRabbit (Undergraduate, CS), 2019–2021
Jon Serrano (Undergraduate, CS), 2019–2022
Nichole Starr (Undergraduate, CS), 2020–2021
Adam Stogsdill (Undergraduate, CS), 2018–2022
Stephen Thoemmes (undergraduate, CS), 2018–2019
Nicholas Woodward (Undergraduate, CS), 2019–2020
Alison Artzberger (Undergraduate, CS), 2018–2018
Jonathan Dimercurio (Undergraduate, CS), 2021–2022
Marcelo Gonzales (Undergraduate, CS), 2017–2018
Lex Graham (Undergraduate, CS), 2019–2019
Joey Lovato (Undergraduate, CS), 2018–2018
Jason Mattney (Undergraduate, CS), 2019–2019
Zoe Oshman (Undergraduate, CS), 2021–2022
Joshua Rands (Undergraduate, CS), 2017–2018
Amira Ramirez-Gonzalez (Undergraduate, CS), 2020–2020
Caleb Rotello (Undergraduate, CS), 2020–Present
Nadia Schreiber (Undergraduate, CS), 2020–2020

[Thesis Committee Member](#)

Nathaniel Gyory, *MS*; *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2023.

Title: SPECTRAL GRAPH FEATURES FOR IMPROVED OBJECT LEVEL PLACE RECOGNITION IN DYNAMIC ENVIRONMENTS

Eryn Rachael Kelsey Adkins, *MS*; *Advisor: Rob Thompson*, Department of Computer Science, Colorado School of Mines, 2023.

Title: DIGITAL ACCESSIBILITY IN COLORADO HIGHER EDUCATION INSTITUTIONS

Michael Walker, *PhD*; *Advisor: Daniel Szafir*, Department of Computer Science, University of North Carolina at Chapel Hill, 2023 (Anticipated).

Title: VAM-HRI Frameworks and Interfaces for Collocated and Remote Robots

Michael Bowman, *PhD*; *Advisor: Xiaolei Zhang*, Department of Mechanical Engineering, Colorado School of Mines, 2023.

Title: Advanced Shared Autonomy from Controlled Environments to the Real-World for Object Telemanipulation

Lingfeng Tao, *PhD*; *Advisor: Xiaolei Zhang*, Department of Mechanical Engineering, Colorado School of Mines, TBD.

Title: Representation Learning through Regularized Optimization for Human-Robot Teaming

Shneka Muthu Kumara Swamy, *PhD Thesis*; *Advisor: Qi Han*, Department of Computer Science, Colorado School of Mines, 2023 (Anticipated).

Title: TBD

Hideki Garcia, *MS*; *Advisor: Megan Strait*, Department of Psychology, University of Texas Rio Grande Valley, 2021.

Title: EFFECTS OF VICTIM GENDERING AND HUMANNESS ON PEOPLE'S RESPONSES TO THE PHYSICAL ABUSE OF HUMANLIKE AGENTS

Aidan Naughton, *MS*; *Advisor: Tom Williams*, Department of Computer Science, Colorado School of Mines, 2021.

Title: EXPLORING THE EFFECTIVENESS OF BODY LANGUAGE IN MITIGATING THE FACE THREAT OF ROBOT NONCOMPLIANCE

Brian Reily, *PhD*; *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2021.

Title: Representation Learning through Regularized Optimization for HumanRobot Teaming

Carl Schader, *BS Research Honors*; *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2020.

Title: Bayesian Deep learning with Multi-Task Outputs to Reduce Uncertainty

Alexandra Joseph, *MS*; *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2022.

Avigal Segal, *PhD*; *Advisor: Anne Silverman and Andrew Petruska*, Department of Mechanical Engineering, Colorado School of Mines, 2022.

Title: DYNAMIC COORDINATION TRAINING WITH MOBILE ROBOTIC FEEDBACK TO IMPROVE NEUROMUSCULAR RESPONSE AND ENGAGEMENT IN JOINT AND BALANCE THERAPY

Qingzhao Zhu, *MS*; *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2022.

Arun Kaashyap Arunachalam, *MS Thesis; Advisor: Hua Wang*, Department of Computer Science, Colorado School of Mines, 2019.

Title: LEARNING INSTANCE-SPECIFIC AND OUTCOME-SENSITIVE DISTANCES FOR CLASSIFYING UNCERTAIN DATA

Ergin Isleyen, *PhD Thesis; Advisor: Sebnem Duzgun*, Department of Mining Engineering, Colorado School of Mines, 2020.

Title: Development of Artificial-Intelligence Based Autonomous Roof Fall Hazard Detection System

Lyu Jian Lu, *PhD Thesis; Advisor: Hua Wang*, Department of Computer Science, Colorado School of Mines, 2021.

Title: LEARNING GUIDED ASSOCIATIONS OF PHENOTYPES AND GENOTYPES USING HIGHORDER MULTI-MODAL REPRESENTATIONS OF LONGITUDINAL MEDICAL DATA

Jared Hamilton, *BS Research Honors; Advisor: Tom Williams*, Department of Computer Science, Colorado School of Mines, 2020.

Title: Tradeoffs Between Performance and Positive Social Perception of Deictic Gestures in Mixed Reality Robotics

Nhan Tran, *MS; Advisor: Tom Williams*, Department of Computer Science, Colorado School of Mines, 2020.

Title: Exploring Mixed Reality Robot Communication Under Different Types of Mental Workload

Lixiao Zhu, *MS; Advisor: Tom Williams*, Department of Computer Science, Colorado School of Mines, 2020.

Title: Effects of Proactive Explanations by Autonomous Systems on Human-Robot Trust

Riley Miller, *MS Thesis; Advisor: Chuan Yue*, Department of Computer Science, Colorado School of Mines, 2020.

Title: Micro-Task Skill Inference for Crowd Workers

Khurram Gulzar, *PhD Thesis; Advisor: Ville Kyrki*, Department of Electrical Engineering and Automation, Aalto University, 2019.

Title: Gesture Execution and Planning for Anchoring between Multi-Embodiment Decentralized Robots from Demonstrations

Jiayi Liu, *PhD Thesis; Advisors: William Hoff and Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2019 (Anticipated).

Title: Object Understanding and Camera Localization

Kai Liu, *PhD Thesis; Advisor: Hua Wang*, Department of Computer Science, Colorado School of Mines, 2019 (Anticipated).

Title: Non-negative Matrix Factorizations: Foundations, Methods, Algorithms, and Applications

Saad Elbeleidy, *Masters Thesis; Advisor: Hua Wang*, Department of Computer Science, Colorado School of Mines, 2018.

Title: Converting Data from Multi-Instance to Single-Instance Representations using P-Order Laplacian Projections

Qualification Exam Committee

Terran Mott, (*Advisor*), Department of Computer Science, Colorado School of Mines, 2021.

Akshit Sharma, *Advisor: Bo Wu*, Department of Computer Science, Colorado School of Mines, 2020.

Ruchen Wen, (*Advisor*), Department of Computer Science, Colorado School of Mines, 2019.

Ryan Blake Jackson, (*Advisor*), Department of Computer Science, Colorado School of Mines, 2019.

Ahmed Alshehri, *Advisor: Chuan Yue*, Department of Computer Science, Colorado School of Mines, 2018.

Connor Holmes, *Advisor: Bo Wu*, Department of Computer Science, Colorado School of Mines, 2018).

Sriram Siva, *Advisor: Hao Zhang*, Department of Computer Science, Colorado School of Mines, 2018.

Wei Han, *Advisor: Bo Wu*, Department of Computer Science, Colorado School of Mines, 2017.

Warren Watkinson, *Advisor: Bo Wu*, Department of Computer Science, Colorado School of Mines, 2017.

Teaching

Courses Taught

Term	School	Course #	Course Title	Responses	Evaluation
Spring 2023	Mines	CSCI 432/532	Robot Ethics	TBD	TBD
Fall 2022	Mines	CSCI 436/536	Human-Robot Interaction	TBD	TBD
Fall 2022 ⁴	Mines	CSCI/EENG 437/507	Computer Vision	TBD	TBD
Spring 2022	Mines	HNRS 498AA	SP TPS: De-Coding the Human Race	TBD	TBD
Spring 2022	Mines	CSCI 432/532	Robot Ethics	TBD	TBD
Fall 2021	Mines	CSCI 436/536	Human-Robot Interaction	TBD	TBD
Spring 2021	Mines	CSCI/HASS 432/532	Robot Ethics	47	4.08
Fall 2020	Mines	CSCI 436/536	Human-Robot Interaction	21	4.24
Fall 2020 ¹	Mines	CSCI/EENG 437/507	Computer Vision	43	4.3
Spring 2020 ²	Mines	CSCI/HASS 498/598	Robot Ethics	23	4.35/5.0
Fall 2019	Mines	CSCI 498/598	Human-Robot Interaction	10	4.9/5.0
Fall 2019	Mines	CSCI/EENG 437/507	Computer Vision	44	4.36/5.0
Spring 2019 ²	Mines	CSCI/HASS 498/598	Robot Ethics	15	3.5/5.0
Fall 2018	Mines	CSCI/EENG 437/507	Computer Vision	65	4.19/5.0
Spring 2018	Mines	CSCI 598B	Linguistic Human-Robot Interaction	10	4.00/5.0
Fall 2017	Mines	CSCI/EENG 437/507	Computer Vision	29	4.59/5.0
Spring 2017	Tufts	COMP 131	Artificial Intelligence	31	3.70/5.0
Fall 2015 ³	Tufts	COMP 131	Artificial Intelligence	16	4.63/5.0

¹ Co-taught with Bill Hoff

² Co-taught with Qin Zhu

³ Co-taught with Anselm Blumer

⁴ Co-taught with Ruchen Wen

Teaching Assistance

Term	School	Course #	Course Title	Course Lead
Fall 2014	Tufts	COMP 150-PR	Probabilistic Robotics	Anselm Blumer
Fall 2013	Tufts	COMP 50	Problem Solving by Computer	Norman Ramsey
Spring 2011	Hamilton	CS 105	Explorations in CS	Stuart Hirshfield
Fall 2010	Hamilton	CS 110	Introduction to CS	Alistair Campbell and Mark Bailey
Spring 2010	Hamilton	CS 110	Introduction to CS	Mark Bailey
Fall 2009	Hamilton	CS 110	Introduction to CS	Alistair Campbell

Curriculum Development

Race and Computing, *Colorado School of Mines*.

Human-Robot Interaction, *Colorado School of Mines*.

Robot Ethics, *Colorado School of Mines*.

Computer Vision, *Colorado School of Mines*.

Linguistic Human-Robot Interaction, *Colorado School of Mines*.

The course explores the capabilities necessary for autonomous robots to participate in natural language dialogue with human partners, including language and gesture understanding, action selection and execution, language and gesture generation, and integrated robot architectures.

Artificial Intelligence, *Tufts University*.

This course is an introductory survey of artificial intelligence (AI). The course covers the history, theory, and computational methods of artificial intelligence, to enable students to (1) identify the major classical and modern AI paradigms, and explain how they relate to each other; (2) analyze the structure of a given problem such that they can choose an appropriate paradigm in which to frame that problem; and (3) implement a wide variety of both classical and modern AI algorithms.

Outreach

Public Talks and Presentations

Presenter, “*Talking with Robots*”, Sciences Leadership Club, Cherry Creek High School, 2021.

K-12 outreach talk on Human-Robot Interaction.

Presenter, “*Talking with Robots*”, Steel City Codes, Denver Chapter, 2021.

K-12 outreach talk on Human-Robot Interaction.

Presenter and Discussant, “*Talking Robotics*”, Mines Robotics, Colorado School of Mines, 2020.

Public discussion on influence and race in robotics.

Panelist, “*Society, Robots and Us*”, Silicon Valley Robotics, 2020.

Public discussion on racism in robotics.

Panelist, *Artificial Intelligence Symposium*, Foothills Art Center, 2019.

Public outreach conversation on AI, Morality, and Video games.

Panelist, *A Study in Chrome: The Ethics of Silverside*, PAX East, 2015.

Organized and participated in a panel introducing robot ethics to members of the public.

<https://youtu.be/yM10N2JfPis>

Presenter, Open House, AAAI Conference on Artificial Intelligence, 2015.

Presented a poster to members of the public.

Targeted Programs

Volunteer, AAAI Connections, AAAI Conference on Artificial Intelligence, 2017.

Outreach program targeted at K-12 students from underserved communities and their parents.

Faculty Mentor, PATHS Program, Colorado School of Mines, 2017-Present.

NSF-Funded scholarship program for academically talented, low-income students in Colorado to study Computer Science at the Colorado School of Mines.
