

Aaquib Tabrez

Curriculum Vitae

PhD Candidate / Research Assistant
University of Colorado Boulder
✉ mohd.tabrez@colorado.edu
📄 aaquibtabrez.github.io
Updated: Jan 2024

Research Interests

I work at the intersection of explainability and human-robot interaction. In my research, I leverage and enhance human-machine communication to achieve value alignment and foster appropriate trust within human-robot teams. My broad interests include Explainable AI, Reinforcement Learning, Multimodal Human-Machine Communication, and Human-Robot Interaction.

Education

- 2019 – 2024 **University of Colorado, Boulder**, GPA: 4.0, Ph.D. Candidate, *Computer Science*.
(expected) Advisor: Bradley Hayes
- 2017–2019 **University of Colorado, Boulder**, GPA: 4.0, MS, *Mechanical Engineering*.
- 2010–2014 **National Institute of Technology Karnataka, India**, B.Tech, *Mechanical Engineering*.

Awards and Recognition

- 2024 **3MT Finalist**.
Selected as a finalist in the 2024 CU Boulder Three Minute Thesis (3MT) competition.
- 2024 **Doctoral Consortium at AAI-2024**.
Selected to present on "Autonomous Policy Explanations for Effective Human-Machine Teaming" at the AAI-2024 Doctoral Consortium.
- 2023 **Doctoral Consortium at AAMAS-2023**.
Selected for a workshop aimed at top early-career researchers in the field of Multi-agent systems.
- 2023 **Annual Research Expo'23 Poster Presentation Award**.
Received best research poster presentation award at the CU Boulder's Annual Research Expo '23.
- 2022 **Robotics: Science and Systems (RSS) Pioneers**.
Selected for workshop bringing together top early career researchers in robotics.
- 2022 **Best Student Paper Award Runner-up at AAMAS**.
For the paper "Descriptive and Prescriptive Visual Guidance to Improve Shared Situational Awareness in Human-Robot Teaming".
- 2022 **Won Spring 2022 Annual Research Expo Event**.
Received the best poster presentation award at the Spring 2022 Annual Research Expo from CU Boulder.
- 2020 **IBM PhD Fellowship Finalist**.
One of three students nominated by the CS department at CU Boulder.
- 2019 **Best Paper Award Finalist for Technical Advances at ACM/IEEE HRI**.
For the paper "Explanation-based Reward Coaching to Improve Human Performance via Reinforcement Learning".
- 2019 **Human-Robot Interaction (HRI) Pioneers**.
Selected for workshop bringing together top early career researchers in HRI.
- 2019 **Awatar and Teji Singh Graduate Fellowship**.
A \$5,000 fellowship for early career PhD students demonstrating a strong academic and research record.
- 2016 **Yuva Prerna Yatra Fellowship**.
Selected as a social entrepreneur fellow to travel, study, and support local entrepreneurs in the Himalayas, leveraging regional resources to foster prosperity.

Papers in Submission

Asterisk (*) denotes shared first authorship

no paper link **Title omitted for blind review.**

Aaquib Tabrez, Ryan Leonard, Bradley Hayes.

In submission: Robotics: Science and Systems (RSS), 2024

no paper link **Title omitted for blind review.**

Matthew B. Luebbbers*, **Aaquib Tabrez***, Kanaka Samagna Talanki, Bradley Hayes.

In submission: IEEE International Conference on Robotics and Automation (ICRA), 2024

Journal Articles

paper link **A survey of Mental Modeling Techniques in Human-Robot Teaming.**

Aaquib Tabrez, Matthew B. Luebbbers, Bradley Hayes.

Springer-Nature Current Robotics Reports, 2020

Conference Publications

paper link **Autonomous Justification for Enabling Explainable Decision Support in Human-Robot Teaming.**

Aaquib Tabrez*, Matthew B. Luebbbers*, Kyler Ruvane*, and Bradley Hayes.

Robotics: Science and Systems (RSS), 2023

paper link **Descriptive and Prescriptive Visual Guidance to Improve Shared Situational Awareness in Human-Robot Teaming.**

Aaquib Tabrez*, Matthew B. Luebbbers*, Bradley Hayes.

International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2022

Best Student Paper Runner-up (Top 2 of 629 submissions).

paper link **Asking the Right Questions: Facilitating Semantic Constraint Specification for Robot Skill Learning and Repair.**

Aaquib Tabrez*, Jack Kawell*, Bradley Hayes.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021

paper link **Explanation-based Reward Coaching to Improve Human Performance via Reinforcement Learning.**

Aaquib Tabrez, Shivendra Agrawal, Bradley Hayes.

ACM/IEEE International Conference on Human Robot Interaction (HRI), 2019

Best Technical Paper Runner-up.

Workshop Publications

paper link **Autonomous Policy Explanations for Effective Human-Machine Teaming.**

Aaquib Tabrez.

Doctoral Consortium at the AAAI Conference on Artificial Intelligence, 2024

paper link **Effective Human-Machine Teaming through Communicative Autonomous Agents that Explain, Coach, and Convince.**

Aaquib Tabrez

Doctoral Consortium at the International Conference on Autonomous Agents and Multiagent Systems, 2023

paper link **Augmented Reality and Proxy Grippers Improve Demonstration-based Robot Skill Learning.**

Carl L. Mueller, Matthew B. Luebbbers, **Aaquib Tabrez**, and Bradley Hayes.

Proceedings of the Workshop on Life-Long Learning with Human Help (L3H2), 2023

paper link **Mediating Trust and Influence in Human-Robot Interaction via Explainable AI.**

Aaquib Tabrez, Bradley Hayes.

Pioneers Workshop at Robotics: Science and Systems (RSS), 2022

- [paper link](#) **Augmented Reality-Based Explainable AI Strategies for Establishing Appropriate Reliance and Trust in Human-Robot Teaming.**
Matthew B. Luebbbers*, **Aaquib Tabrez***, Bradley Hayes.
Workshop on Virtual, Augmented and Mixed Reality for Human-Robot Interaction (VAM-HRI), 2022
- [paper link](#) **Solutions for Socially Intelligent HRI in Real-World Scenarios (SSIR-HRI).**
Karen Tatarian, Sera Buyukgoz, Marine Chamoux, **Aaquib Tabrez**, Bradley Hayes, Mohamed Chetouani.
Companion of the ACM/IEEE International Conference on Human-Robot Interaction, 2021
- [paper link](#) **Interactive Constrained Learning from Demonstration Using Visual Robot Behavior Counterfactuals.**
Carl Mueller, **Aaquib Tabrez**, Bradley Hayes
Workshop on Accessibility of Robot Programming and Work of the Future at RSS, 2021
- [paper link](#) **Emerging Autonomy Solutions for Human and Robotic Deep Space Exploration.**
Matthew B. Luebbbers*, Christine T. Chang*, **Aaquib Tabrez***, Jordan Dixon*, Bradley Hayes.
SpaceCHI: Human-Computer Interaction for Space Exploration, 2021
- [paper link](#) **Automated Failure-Mode Clustering and Labeling for Informed Car-To-Driver Handover in Autonomous Vehicles.**
Aaquib Tabrez*, Matthew B. Luebbbers*, Bradley Hayes.
Workshop on Assessing, Explaining, and Conveying Robot Proficiency for Human-Robot Teaming, 2020
- [paper link](#) **Improving human-robot interaction through explainable reinforcement learning.**
Aaquib Tabrez, Bradley Hayes.
Companion of the ACM/IEEE International Conference on Human-Robot Interaction, 2019

Teaching & Research Assistantships

- Spring 2021 - Present **Army Research Lab **STRONG Program**: Strengthening Teamwork for Robust Operations in Novel Groups**, *University of Colorado Boulder, CO.*
Research Assistant, Prof. Bradley Hayes
- Fall 2020 **CSCI 5302/4302: Advanced Robotics**, *University of Colorado Boulder, CO.*
Teaching Assistant, Prof. Bradley Hayes
- Fall 2020 **CSCI 3302: Introduction to Robotics**, *University of Colorado Boulder, CO.*
Teaching Assistant, Prof. Bradley Hayes
- Spring 2020 **CSCI 5922: Neural Networks and Deep Learning**, *University of Colorado Boulder, CO.*
Teaching Assistant, Profs. Adam Bloniarz & Shumin Wu
- Fall 2019 **CSCI 3302: Introduction to Robotics**, *University of Colorado Boulder, CO.*
Teaching Assistant, Prof. Bradley Hayes
- Spring 2019 **CSCI 5322: Algorithmic Human-Robot Interaction**, *University of Colorado Boulder, CO.*
Course Grader, Prof. Bradley Hayes
- Spring 2018 **MCEN-4026: Manufacturing Processes and Systems**, *University of Colorado Boulder, CO.*
Course Grader, Prof. Jenifer Blacklock

Workshop Committee Leadership

- August 2023 **Workshop on Human-Robot Interaction for Explainability in Robotics**, *RO-MAN 2023.*
Co-Organizer
- June 2023 **RSS Pioneers 2023 Workshop**, *RSS 2023.*
Program Committee Chair
- March 2021 **Solutions for socially intelligent HRI in real-world scenarios workshop**, *HRI 2021.*
Co-Organizer
- March 2021 **HRI Pioneers 2021 Workshop**, *HRI 2021.*
Program Chair

- August 2020 **Solutions for socially intelligent HRI in real-world scenarios workshop**, RO-MAN 2020.
Co-Organizer
- March 2020 **HRI Pioneers 2020 Workshop**, HRI 2020.
Program Chair

Invited Panels and Talks

- 2023 **Talking Robotics**, *Building Trust and Transparency through Explainable Multimodal Communication*.
- 2021 **University of Colorado Boulder**, *Mediating Trust and Influence in Human-Robot Interaction via Explainable AI*, Robotics Summer Seminar Series.

Professional Experience

- 2014 – 2016 **Daimler**, *Chennai, India*.
Procurement Manager
- Aug 2012 – Dec 2012 **Kudremukh Iron Ore Company**, *Kudremukh, India*.
Industrial Intern

Research Mentorship

- 2024 - **David Chaparro**, *Masters*, CU Boulder.
- 2023 - **Kyler Ruvane**, *Masters*, CU Boulder.
- 2023 **Nathan Howard**, *Masters*, CU Boulder.
- 2022 - 2023 **Kanaka Talanki Sreenivasa Murthy**, *Masters*, CU Boulder.
- 2021 - 2022 **Karthik Siddaramanna**, *Masters*, CU Boulder.
- 2020 - 2021 **Aditi Periyannan**, *Undergraduate*, Tufts University.
- 2019 **Felix Moses**, Berkeley High School.
- 2019 **Stephen Kwak**, Bellarmine High School.
- 2018 - 2019 **Xi Hu**, *Undergraduate*, CU Boulder.

Conference and Journal Review

IEEE Robotics and Automation Letters (RA-L)

ACM Transactions on Human-Robot Interaction (T-HRI)

International Journal of Human-Computer Interaction (IJHCI)

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

IEEE International Conference on Robotics and Automation (ICRA)

IEEE International Conference on Intelligent Robots and Systems (IROS)

CHI: Conference on Human Factors in Computing Systems (CHI)

IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)

Explainable AI Planning Workshop (XAIP), ICAPS

Workshop on Explainable Artificial Intelligence (XAI), IJCAI

Companion of the Robotics: Science and Systems (RSS Pioneers)

Companion of the International Conference on Human-Robot Interaction (HRI Pioneers)

Late Breaking Reports at HRI