Hooman Hedayati

email: hooman.hedayati@colorado.edu Phone: +1 682 241 7023

Mainly my research is to find "what" type of information should a robot conveys to humans and "how" to present such information. To answer the "how", I often use novel solutions such as augmented reality and gestures. Also, I'm interested in reasoning about multi-party conversational groups (also known as *F-formations*) between humans and robots.

Research Interests

- Human-Robot Interaction
- Assistive Free-Flying Robots
- Virtual and Augmented Reality
- Robotics / Wearable Robots
- Conversational Groups / F-formations
- Reinforcement Learning / Deep RL

Education

May 2021 *Expected* — PhD in Computer Science, **University of Colorado Boulder**, USA
Funded by NASA ECF Award (NNX16AR58G PI: Szafir) | Advisor: Daniel Szafir

Dec. 2015 — M.Sc in Computer Science, **East Carolina University**, USA (Gpa: 4.0/4.0)
Thesis: "MRSL: Neural Network based Positioning System" | Advisor: MHN Tabrizi

July 2012 — B.Sc in Electrical Engineering, **Lahijan Azad University**, IRAN

Research Experience

Research Assistant, Interactive Robotics and Novel Technologies Lab
University of Colorado Boulder
Aug. 2016 to *Current*
Developed scalable interface technologies for supervising aerial robots and new algorithms and techniques for communicating robot state to nearby users.

Research Intern at *Bosch Research*
May. 2020 to *Aug. 2020*
Reinforcement Learning and Learning from Demonstration for autonomous vehicles

Research & Development Lab Associate at *Disney Research*
May. 2019 to *Aug. 2019*
Research, studying multi-party conversational groups. By collecting data and analyzing it we tried to a computational model to detect and categorize F-formations

Research Intern at *Microsoft Research*
May. 2018 to *Aug. 2018*
Research and developing an algorithm to help robots detect F-formations and conversational groups.

Teaching Experience

Fall 2016 — "Software Methods and Tools" Teaching Assistant, CU Boulder, USA
Spring 2015 — "Introduction to computer Science" Instructor , ECU, USA

Selected Publications

"PufferBot: Actuated Expandable Structures for Aerial Robots" **H.Hedayti**, R.Suzuki, D.Leithinger, D.Szafir
In the Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'20)
- Acceptance rate 47%

"REFORM: Recognizing F-formations for Social Robots" **H.Hedayti**, A.Muehlbradt, D.Szafir, S.Andrist
In the Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'20) - Acceptance rate 47%

"RoomShift: Room-scale Dynamic Haptics for VR with Furniture-moving Swarm Robots" R.Suzuki, **H.Hedayti**, C.Zheng, J.Bohn, D.Szafir, E.Do, M.Gross, D.Leithinger
In the Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI'20) - Acceptance rate 24%

"Robot Teleoperation with Augmented Reality Virtual Surrogates" M.Walker, **H.Hedayti**, D.Szafir
In the Proceedings of the ACM/IEEE International Conference on Human Robot Interaction (HRI'19) - Acceptance rate 24%

"Improving Collocated Teleoperation with Augmented Reality" **H.Hedayti**, M.Walker, D.Szafir
In the Proceedings of the ACM/IEEE International Conference on Human Robot Interaction (HRI'18) - Best Paper Award Nominee (Top 10 in 217 submissions)

"Communicating Robot Intent with Augmented Reality" M.Walker, **H.Hedayti**, J.Lee, D.Szafir
In the Proceedings of the ACM/IEEE International Conference on Human Robot Interaction (HRI'18) - Best Paper Award (Top 4 in 217 submissions)

Honors and Awards

2020	Ralph J. Slutz Student Excellence Award at University of Colorado Boulder
2018	Outstanding Research Excellence Award at University of Colorado Boulder
2018	Best Paper Award ACM/IEEE HRI '18
2018	Best Paper Award Nominee ACM/IEEE HRI '18
2015	Outstanding Graduate Student Award at East Carolina University
2015	Best Research award in ECU Research week at East Carolina University
2015	Golden Key International Honor Society
2015	PHI KAPPA PHI Honor Society
2014	Cisco Certified Entry Networking Technician (CCENT)

Skills

Programming:	C#, C++, Java, Python, Processing
Operating system:	Linux, Windows
Software and Services:	ROS, Matlab, R, Jump, TensorFlow
Physical Prototyping:	Arduino, electronics (basic), laser-cutting, 3D printing
VR/AR Prototyping:	Unity3D, Vuforia, Kinect

Selected Coursework

- University of Colorado Boulder: Human-Robot Interaction, Soft Robotics, Feedback Control, Inclusive Design and Assistive Technology, Robot Perception.
- East Carolina University: Human-Computer Interaction , Operating Systems II , Data MiningSoftware Engineering Foundation , Computability and ComplexityDesign and Analysis Algorithms , Computer Systems Architecture.
- Online Courses: Autonomous Navigation for Flying Robots (Technische Universität München), Machine Learning (Stanford), Cryptography I (Stanford), Algorithms: Design and Analysis I,II (Stanford).

Selected Research Projects

Drone Controller (CU Boulder)

PID controller for AscTec Hummingbird

Designed and implemented a PID controller for AscTec Hummingbird aerial robot. The controller was used as able to take a point or trajectory as input and navigate the drone precisely to the specified location.

AR controller (CU Boulder)

HoloLens and drone integration

Designed and implemented a drone controller on Microsoft HoloLens. User could select a point in the space and the controller translate the coordinate and navigate the drone to that location.

Connect 2 Rehab (ECU)

Project for Software Engineering Foundation Course

The goal of this project is to help patients do their physiotherapy at home. The DPT would upload a set of suitable exercises for the use of patient through a web application as a video game. Then, a Microsoft Kinect would detect the movement of patient at home and record the relevant data to report progress of patient. Java, C#, SQL and JS were used in this project.