RESEARCH STATEMENT

I envision future after-disaster missions to be efficiently conducted by fully autonomous robots, which are (1) highly capable of reliably moving through challenging and most likely adversarial environments, and (2) highly intelligent so that involvement of human rescuers, both physically and intellectually, can be effectively minimized. Therefore, my research goal is to develop highly capable and intelligent mobile robots that are robustly deployable in the real world with minimal human supervision. As a roboticist with unique expertise evenly grounded in motion planning and machine learning, and vast experience working on real-world problems in the field with disaster responders, I build advanced robot platforms, develop complex sensing and actuation systems, design sophisticated motion planning algorithms, and set up standardized testbeds and metrics in order to create highly capable and intelligent robots to locomote on land, in air, and at sea.

PROFESSIONAL PREPARATION

- **Ph.D.** (Computer Science, 2019), [Texas A&M University](https://www.tamu.edu/), College Station, TX
  - Dissertation: *Risk-aware Path and Motion Planning for a Tethered Aerial Visual Assistant in Unstructured or Confined Environments*
  - Thesis Committee: Robin R. Murphy (Chair), Dylan A. Shell, Thomas R. Ioerger, Suman Chakravorty
- **Master of Science** (Mechanical Engineering, 2015), [Carnegie Mellon University](https://www.cmu.edu/), Pittsburgh, PA
  - Advisor: William (Red) L. Whittaker
- **Bachelor of Engineering** (Mechatronics Engineering, Dual-Degree, 2013), [Tongji University](https://www.tongji.edu.cn/), Shanghai, P.R. China
  - [FH Aachen University of Applied Sciences](https://www.fh-aachen.de/), Aachen, North Rhine-Westphalia, Germany

APPOINTMENTS

Academia

- **George Mason University**, 08/2022-current
  - Assistant Professor, Department of Computer Science
- **University of Texas at Austin**, 06/2021-08/2022
  - Research Affiliate, Learning Agents Research Group (LARG)
- **University of Texas at Austin**, 08/2019-05/2021
  - Postdoctoral Researcher, Learning Agents Research Group (LARG)
- **Texas A&M University**, 08/2015-08/2019
  - Graduate Research Assistant, Center for Robot-Assisted Search and Rescue (CRASAR)
- **Carnegie Mellon University**, 08/2014-05/2015
  - Graduate Research Assistant, Biorobotics Lab
Carnegie Mellon University, 09/2013-11/2014  
Graduate Research Assistant, Field Robotics Center

Industry

• X, The Moonshot Factory, 06/2021-current  
Roboticist, Mountain View, CA

• Facebook Reality Labs, 05/2018-08/2018  
Research Intern, Sausalito, CA

• Microsoft Research Labs, 05/2017-08/2017  
Research Intern, Redmond, WA

• PHOENIX CONTACT GmbH & Co. KG, 02/2013-06/2013  
Intern & Bachelor Thesis Author, Blomberg, Germany

• DELPHI China Technical Center, 06/2012-08/2012  
Advanced Intern, Shanghai, China

• Siemens Industrial Automation Ltd., Shanghai, 05/2011-09/2011  
Assistant Engineer, Shanghai, China

• Luther Attorneys Shanghai, 07/2010-08/2010  
Executive Assistant, Shanghai, China

PUBLICATIONS

Journal


**Conference**


Xuesu Xiao, Page 5 of 11


Workshop / Extended Abstract


Preprint


**Technical Report**


**Dissertation**


**Patent**


**SELECTED PROJECTS**

- Tactical Team Behavior with Hierarchical Decision Making using Game Theory and Learning, 09/2022-current
Co Principal Investigator ($481,114K), Tactical Behaviors for Autonomous Maneuver Collaborative Research Program (TBAM-CRP)-Cycle 1 Sprint Topic: Coordinated and adversarial tactical maneuver in complex terrains funded by US Army Research Laboratory

- **Learning Kinodynamics for Accurate, High-Speed, Off-Road Ground Maneuvers on Unstructured Terrain, 09/2022-current**
  Principal Investigator ($817K), AI/ML Research for Expeditionary Maneuver and Air/Ground Reconnaissance funded by US Army Research Laboratory

- **Inspection of City Infrastructure via Peripheral Perception, 09/2020-08/2022**
  Project Lead, Good Systems Grand Challenge funded project at University of Texas at Austin

  Project Lead, Army Research Laboratory (ARL) Collaborative Research Alliance (CRA) funded Distributed and Collaborative Intelligent Systems and Technology (DCIST) project at University of Texas at Austin

- **NRI: A Collaborative Visual Assistant for Robot Operations in Unstructured or Confined Environments, 09/2016-08/2019**
  Project Lead, Department of Energy funded NSF NRI project at Texas A&M University

- **NRI: Collaborative: Exploiting Granular Mechanics to Enable Robotic Locomotion, 05/2016-08/2019**
  Main Participant, NSF NRI funded project at Texas A&M University

- **NSF RAPID: Using an Unmanned Aerial Vehicle and Increased Autonomy to Improve an Unmanned Marine Vehicle Lifeguard Assistant Robot, 01/2016-08/2019**
  Project Lead, NSF funded project at Texas A&M University

  Main Participant, NSF NRI funded project at Carnegie Mellon University

**INVITED TALKS**

“Learning Agile Ground Maneuvers in Highly Constrained and Off-Road Conditions”
- Invited Talk @ Agile Robotics: Perception, Learning, Planning, and Control Workshop, 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, 10/27/2022

“Evaluating Motion Planning “in-the-Loops””
- Invited Talk @ Evaluating Motion Planning Performance Workshop, 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, 10/28/2022

“Deployable Robots that Learn”
- Seminar Series @ Harbin Institute of Technology, Harbin, China 09/02/2022
- Kavraki Lab @ Rice University, Houston, TX 06/08/2022
- Maryland Robotics Center @ University of Maryland, College Park, MD 04/29/2022
- IFML Talk Series @ The University of Texas at Austin, Austin, TX 04/08/2022
- Robot Mobility @ Google, Mountain View, CA 03/23/2022
- LCSR Seminar @ Johns Hopkins University, Baltimore, MD 02/02/2022
- DEVCOM ARL Colloquium @ Army Research Laboratory, Adelphi, MD 11/17/2021
- Oxford Robotics Institute @ Oxford University, Oxford, UK 11/12/2021
- Department Seminar @ University of Nebraska-Lincoln, Lincoln, NE 03/17/2021
- Department Seminar @ Illinois Institute of Technology, Chicago, IL 03/08/2021
- Department Seminar @ George Mason University, Fairfax, VA 02/24/2021
- LARRI Seminar @ University of Louisville, Louisville, KY 02/12/2021

“High-Speed Motion Control with Learned Kinodynamic Models for Off-Road Navigation”
• **Guess Lecture for CS 378H @ The University of Texas at Austin, Austin, TX** 03/21/2022

## TEACHING

- **CS580 Introduction to Artificial Intelligence**  
  *Instructor*, George Mason University, Fall 2022
- **CS309 Autonomous Intelligent Robotics (FRI II)**  
  *Co-Instructor*, University of Texas at Austin, Fall 2020
- **CS309 Autonomous Intelligent Robotics (FRI I)**  
  *Co-Instructor*, University of Texas at Austin, Spring 2020
- **CSCE 121 Introduction to Program Design and Concepts**  
  *Teaching Assistant*, Texas A&M University, Spring 2016
- **CSCE 121 Introduction to Program Design and Concepts**  
  *Teaching Assistant*, Texas A&M University, Fall 2015
- **Robotics 778 Mechatronic Design**  
  *Teaching Assistant*, Carnegie Mellon University, Spring 2015

## STUDENT MENTORSHIP

**George Mason University**

Mohammad Nazeri, Ph.D. student starting 01/2023  
Seyed Shahriar Sheikh Aboumasoudi, Ph.D. student starting 01/2023  
Manshi Limbu, Ph.D. student 10/2022-current  
Anuj Pokhrel, Ph.D. student 09/2022-current  
Amir Hossain Raj, Ph.D. student 08/2022-current  
Chenhui Pan, Ph.D. student 08/2022-current  
Duc (Aaron) M. Nguyen, Ph.D. student 08/2022-current  
Anujet Anand Datar, Master student 10/2022-current  
Dileep Kumar, Master student 08/2022-current

**University of Texas at Austin**

Haresh Karnan, Ph.D. student 12/2020-current  
Jinsoo Park, Ph.D. student 08/2020-current  
Zizhao Wang, Ph.D. student 08/2020-current  
Zifan Xu, Ph.D. student 05/2020-current  
Bo Liu, Ph.D. student 12/2019-08/2022  
Fulin Jiang, Undergraduate student 05/2022-08/2022  
Kevin Hou, Undergraduate student 01/2022-08/2022  
James Xu, Undergraduate student 01/2022-08/2022  
Ruolin Dong, Undergraduate student 01/2022-08/2022  
Anirudh Nair, Undergraduate student 05/2020-08/2022  
Daniel Perille, Undergraduate student 05/2020-09/2021  
Ashwin Perille, Undergraduate student 05/2020-09/2021  
Gauraang Dhamankar, Undergraduate student 05/2020-06/2021  
Abigail Truong, Undergraduate student 05/2020-03/2021  
William Shi, Undergraduate student 08/2020-12/2020  
Yuntong Qu, Undergraduate student 08/2020-12/2020
Texas A&M University

Jan Dufek, Ph.D. student 08/2019-08/2020
Mohamed Suhail, Master student 08/2017-05/2018
Rebecca Schofield, Undergraduate student 08/2017-05/2018

SERVICE

Chair
- IEEE ICRA 2022 Competition The Benchmark Autonomous Robot Navigation (BARN) Challenge
- IEEE ICRA 2021 Workshop Machine Learning for Motion Planning

Organizing Committee
- CoRL 2022 Workshop Learning for Agile Robotics
- ACM/IEEE HRI 2022 Workshop Human-Interactive Robot Learning (HIRL)
- ACM/IEEE HRI 2021 Workshop Exploring Applications for Autonomous Non-Verbal Human-Robot Interactions

Associate Editor
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)

Senior Program Committee
- International Joint Conferences on Artificial Intelligence (IJCAI)

Program Committee
- AAAI-2023 Student Abstract and Poster Program
- NeurIPS 2022 Workshop on Reinforcement Learning for Real Life
- The AAAI Conference on Artificial Intelligence (AAAI)
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
- IEEE ICRA 2020 Workshop Machine Learning in Planning and Control of Robot Motion

Reviewer Board
- MDPI Applied Sciences
- MDPI Sensors

Journal Reviewer
- IEEE Robotics and Automation Letters (RA-L)
- IEEE Robotics and Automation Magazine (RAM)
- IEEE Transactions on Automation Science and Engineering (T-ASE)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Access
- ACM Transactions on Human-Robot Interaction (THRI)
- Elsevier Robotics and Autonomous Systems (RAS)
- AI Access Foundation Journal of Artificial Intelligence Research (JAIR)
- MDPI Journal of Marine Science and Engineering (JMSE)
Conference Reviewer

- Robotics: Science and Systems (RSS)
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- ACM/IEEE International Conference on Human-Robot Interaction (HRI)
- IEEE International Symposium on Multi-Robot and Multi-Agent Systems (MRS)
- IEEE European Conference on Mobile Robots (ECMR)
- International Conference on Machine Learning (ICML)
- International Conference on Learning Representations (ICLR)
- Conference on Neural Information Processing Systems (NeurIPS)

PRESS COVERAGE

- Clearpath Robotics, [Jackal UGV Shines in ICRA 2022 Autonomous Navigation Challenge](#), 06/07/2022
- IEEE Spectrum, [How the US Army is Turning Robots into Team Players](#), 09/23/2021
- US Army, [Soldiers could teach future robots how to outperform humans](#), 08/12/2020
- Robotics Business Review, [How Robots and Drones are Changing Rescue Operations](#), 11/27/2019
- Tech Briefs, [Drones and AI Improve 'EMILY' Lifesaver Robot for Large-Scale Water Rescues](#), 06/30/2018
- NSF Science Nation, [Water rescue robot EMILY gets some help from the sky](#), 02/26/2018
- WIRED, [Marsupial Robots Ain't Cuddly, But They Are Totally Brilliant](#), 04/08/2017
- KBTX, [Search and rescue workers, drones, robots, gather in Grimes County for training](#), 01/28/2017

HONORS

- 2018 IEEE International Conference on Wearable and Implantable Body Sensor Networks (BSN), Student Travel Award (03/2018)
- The Excellent Graduate of Shanghai (06/2013)
- DAAD Scholarship (German Ministry of Education) (09/2012)
- National Scholarship (Chinese Ministry of Education) (09/2012)
- Learning Scholarship of Tongji University (09/2012)
- The Excellent Student of Tongji University (09/2012)
- National Scholarship (Chinese Ministry of Education) (09/2011)
- Learning Scholarship of Tongji University of the School Year 2010-2011 (09/2011)
- The Excellent Student of the School Year 2010-2011 of Tongji University (09/2011)
- Ni-Li-Shi Scholarship (awarded to the best students) (09/2010)
- Learning Scholarship of Tongji University of the School Year 2009-2010 (09/2010)
- The Excellent Student of the School Year 2009-2010 of Tongji University (09/2010)

PERSONAL
Languages:
- Chinese (native)
- English (fluent)
- German (fluent)