

Hongrui Zheng

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Education

University of Pennsylvania

PH.D IN ELECTRICAL AND SYSTEMS ENGINEERING

Philadelphia, PA

May. 2020 - May. 2025

University of Pennsylvania

M.S.E IN ROBOTICS

Philadelphia, PA

Aug. 2017 - May. 2019

Georgia Institute of Technology

DUAL DEGREES: B.S. IN COMPUTER SCIENCE, B.S. IN MECHANICAL ENGINEERING

Atlanta, GA

Aug. 2012 - May. 2017

Experience

xLab (Safe Autonomous Systems Lab), University of Pennsylvania

RESEARCH ASSISTANT, PH.D CANDIDATE

Philadelphia, PA

May. 2019 - Present

- Advised by Professor Rahul Mangharam.
- Research on game-theoretic approaches for multi-agent competitive and cooperative strategies.

Georgia Tech Systems Research Lab

RESEARCH ASSISTANT

Atlanta, GA

Aug. 2014 - May. 2017

- Developed and improved an algorithm for human following using facial detection and optical flow on a miniature blimp with a monocular camera.

Selected Publications

FORMULAZERO: Distributionally Robust Online Adaptation via Offline Population Synthesis

International Conference on Machine Learning (ICML) 2020

A. SINHA*, M. O'KELLY*, **H. ZHENG***, R. MANGHARAM, J. DUCHI, R. TEDRAKE (*EQUAL CONTRIBUTION)

Game-theoretic Objective Space Planning

Preprint, Under review

H. ZHENG, Z. ZHUANG, J. BETZ, R. MANGHARAM

Differentiable Trajectory Generation for Car-like Robots with Interpolating Radial Basis Function Networks

Preprint, Under review

H. ZHENG, R. MANGHARAM

TUNERCAR: A Superoptimization Toolchain for Autonomous Racing

Proceedings of the International Conference on Robotics and Automation (ICRA) 2020

M. O'KELLY*, **H. ZHENG***, A. JAIN*, J. AUCKLEY, K. LUONG, R. MANGHARAM (*EQUAL CONTRIBUTION)

Local_INN: Implicit Map Representation and Localization with Invertible Neural Networks

Proceedings of the International Conference on Robotics and Automation (ICRA) 2023

Z. ZANG, **H. ZHENG**, J. BETZ, R. MANGHARAM

F1TENTH: An Open-source Evaluation Environment for Continuous Control and Reinforcement Learning

Proceedings of Machine Learning Research, Conference on Neural Information Processing Systems (NeurIPS) 2019 Competition and Demonstration Track

M. O'KELLY, **H. ZHENG**, D. KARTHIK, R. MANGHARAM

Monocular vision-based human following on miniature robotic blimp

Proceedings of the International Conference on Robotics and Automation (ICRA) 2017

N. YAO, E. ANAYA, Q. TAO, S. CHO, **H. ZHENG**, F. ZHANG

Developed human following algorithm with facial detection/tracking on a miniature blimp.

Teaching

ESE 680-007, ESE 615: Autonomous Racing

University of Pennsylvania

Fall 2019, Spring 2020, 2022,

2023

CO-INSTRUCTOR AND TEACHING ASSISTANT

- Created lecture material and coding assignments for *Pose Representation and Transformation, Geometric Path Tracking, Motion Planning, Race Line Optimization, and Model Predictive Control*.
- Graded above assignments and organized 3 races throughout the semester.
- Built and maintained the hardware platform and software stack used by students.

Skills

Programming Language Python, \LaTeX

Framework & Toolkit NumPy, Numba, JAX, SciPy, PyTorch, Docker, ROS, ROS 2

Awards

2019 **Best Demonstration Honorable Mention**, NeurIPS 2019

Vancouver, Canada

Community

ICRA 2023, IROS 2023, IEEE-RAM, Reviewer

F1TENTH, Lead Developer and Community Manager

fitenth.org

Annual **F1TENTH Grand Prix**, Organizer

fitenth.org/race.html

2022 **Workshop on Opportunities and Challenges with Autonomous Racing**, Organizer

icra2023.fitenth.org

2023 **Workshop on Multi-Agent Dynamic Games**, Organizer

iros2023-madgames.fitenth.org