Qingze Huo

qh223@cornell.edu | Columbus, Ohio 43220 | 872-806-4173 | linkedin.com/in/qingze-huo

SUMMARY

- Proficient in Python and modern C++ with extensive experience in robotics software development
- Strong expertise in perception, tracking, planning and navigation using both traditional and machine learning based approaches with practical experience in deploying them in robotic systems
- Familiar with robotic concepts, including kinematics, dynamics, control systems, localization and mapping
- Experienced with Agile software development practices and delivering high-quality software for robotics systems
- Familiar with common robotics software development tools including ROS, OpenCV and PyTorch
- Strong problem-solving and mathematics skills with a passion for innovation in robotics and autonomy

EDUCATION

Cornell University Ithaca, NY
Ph.D. in Mechanical Engineering, GPA: 4.05/4.30 Aug 2018-Dec 2023
Advisor: Silvia Ferrari *Minor:* ***Computer Science****, Electrical and Computer Engineering*
Relevant Courses: Intelligent Sensor Planning and Control, Reinforcement Learning for Robot Decision Making, Foundations of Reinforcement Learning, Introduction for Computer Vision

Northwestern University Evanston, IL
Master of Science in Mechanical Engineering, GPA: 4.00/4.00 Sep 2016-May 2018

Dalian University of Technology Dalian, China
Bachelor of Engineering in Engineering Mechanics, GPA: 85/100 Sep 2012-June 2016

WORK EXPERIENCE

ADAS Software Engineer, Sensor Fusion, *Canoo Inc, Oklahoma City* **(**Jan 2024-Present**)**

- Design, test, optimize and deploy a real-time Joint probabilistic data association-based multi-sensor multi-object tracking and sensor integration algorithm for onboard cameras, LIDAR, Radar and IMUs
- Develop a simulation-in-the-loop CI/CD pipeline for automatic tracker evaluation and tuning, leveraging cloud infrastructure with Docker and Airflow to accelerate development and ensure optimal performance
- Collaborate with cross-functional teams to integrate sensor fusion solutions, ensuring reliability through rigorous unit, SIL, HIL, and real-world testing

RESEARCH EXPERIENCE

Pedestrian Trajectory Prediction Using Probabilistic Graphical Models for Social Planning and Control, *Cornell University* **(**2021-2023**)**

- Developed a Dynamic Bayesian Network based Machine Learning model for trajectory prediction that achieved 30 percent error (MSE) improvement over the *state-of-the-art* methods under behavior changing scenarios, contributing to safe path planning and navigation capabilities in autonomous systems
- Advanced multiple vision-based Machine Learning algorithms including age classification, action change recognition and interaction detection for efficient and accurate hidden variables inference in the DBN model

Neuromorphic Event-based Perception Algorithms for MAV Control, *Cornell University* (2021-2023)

- Enhanced multiple neuromorphic event-based perception algorithms, delivering significant time and energy efficiency for real-time action and object recognition.
- Led comprehensive physical and simulation-based experiments using a micro aerial vehicle (MAV) for gesture-controlled human-robot interaction, demonstrating the efficacy of the developed perception algorithms.

Vision-based Role Inference and Action Anticipation in Human Teams, *Cornell University* (2019-2021)

- Contributed to the development of a novel dynamic Markov random field (DMRF) and MLP-based deep learning model to infer and anticipate Volleyball game strategy and players' roles and actions from raw video frames

RECENT PUBLICATIONS

[1] **Q. Huo,** and S. Ferrari. "Pedestrian Trajectory Prediction under Abrupt Changing Scenarios". *IEEE Transactions on Intelligent Transportation Systems.* submitted.
[2] **Q. Huo**, S. Ferrari, et al. "Robot-embodied Real-time Human-Robot Interaction". *IEEE Robotics and Automation Magazine.* submitted.
[3] **Q. Huo**, Y. Shi, C. Liu, V. Tarokh, and S. Ferrari. "Online Action Change Detection for Automatic Vision-based Ground Control of Aircraft". *AIAA SCITECH 2022 Forum*, San Diego, CA, 2022, pp. 2209-2031.