

Shijie Gao

PHD STUDENT · COMPUTER ENGINEERING

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Education

University of Virginia

PH.D., COMPUTER ENGINEERING

Charlottesville, VA

Expected Fall 2023

- Advisor: Prof. Nicola Bezzo (bezzorobotics.com)
- Present Standing: Passed the Ph.D., comprehensive examination
- Research Interest: Adaptive motion planning, Transfer learning, System failure detection and recovery.

Beijing Institute of Technology

B.S., AUTOMATION

Beijing, China

Aug. 2013 - July 2017

University of California Berkeley

EXCHANGE STUDENT

Berkeley, CA

Aug. 2016 - May 2017

Research Experience

University of Virginia

Graduate Research Assistant

Charlottesville, VA

Aug. 2018 - Present

- Developed a **Meta-Learning** based frame work to **predict** the system's states and uncertainties under **degradation conditions** and a safe path planning method to keep the degraded system safe.
- Developed a conformal mapping based **transfer learning** frame work that bridges the gap for Sim-to-Real and Real-to-Real transferring problems.
- Developed a **sensing** and **energy efficient** path planning frame work by leveraging **ground/ceiling effects** for quadrotors.

Publications

UNDER REVIEW

- [1] Lauren Bramblett, **S. Gao**, and N. Bezzo, "Epistemic Prediction and Planning with Implicit Coordination for Multi-Robot Teams in Communication Restricted Environments", IEEE International Conference on Robotics and Automation (ICRA), 2023

PUBLISHED

- [1] **S. Gao***, E. Yel* and N. Bezzo, "Meta-Learning-based Proactive Online Planning for UAVs under Degraded Conditions", IEEE Robotics and Automation Letters (RA-L), 2022 (*Co-first author)
- [2] P.J. Bonczek, R. Peddi, **S. Gao**, N. Bezzo. "Detection of Nonrandom Sign-Based Behavior for Resilient Coordination of Robotic Swarms", IEEE Transactions on Robotics (T-RO), 2022.
- [3] **S. Gao**, N. Bezzo. "A Conformal Mapping-based Framework for Robot-to-Robot and Sim-to-Real Transfer Learning", 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 1289-1295. IEEE, 2021.
- [4] G. Glaubit, K. Kleeman, N. Law, J. Thomas, **S. Gao**, R. Peddi, E. Yel, N. Bezzo. "Fast, Safe, and Proactive Runtime Planning and Control of Autonomous Ground Vehicles in Changing Environments", 2021 Systems and Information Engineering Design Symposium (SIEDS), pp. 1-6. IEEE, 2021.
- [5] R. Peddi, C. Di. Franco, **S. Gao**, N. Bezzo, "A data-driven framework for proactive intention-aware motion planning of a robot in a human environment", 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) (pp. 5738-5744). IEEE, 2020
- [6] P.J. Bonczek, **S. Gao**, N. Bezzo. "Model-based randomness monitor for stealthy sensor attacks", 2020 American Control Conference (ACC) (pp. 2036-2042). IEEE, 2020.
- [7] D. Carter, M. Mazzatenta, **S. Gao**, C. di. Franco, N. Bezzo, D. Quinn. "Scaling effects on aerodynamic interactions of rotorcraft around boundaries", APS Division of Fluid Dynamics Meeting Abstracts (pp. B09-004). 2019.
- [8] **S. Gao**, C. Di. Franco, D. Carter, D. Quinn, N. Bezzo. "Exploiting ground and ceiling effects on autonomous UAV motion planning", 2019 International Conference on Unmanned Aircraft Systems (ICUAS) (pp. 768-777). IEEE, 2019.

EXPERIENCES

Reviewer, American Control Conference(ACC)

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

Reviewer, IEEE International Conference on Robotics and Automation (ICRA)

Reviewer, IEEE Robotics and Automation Letters(RA-L)

Reviewer, Mediterranean Conference on Control and Automation(MED)

Fall 19', 20', 21',
22'

Autonomous Mobile Robot, Graduate Teaching Assistant

Spring, 19', 20',
21'

Advisement, Discussion, ECE Undergraduate Student Capstone

Sep. 2019

2nd Place Presenter, ECE Student Research Poster Session

Fall, 19'

Presenter, UVA Link Lab Student Flash Talks

Fall, 19'

Finalist, UVA Engineering Research Innovation Award(RIA)

SKILLS

Proficient in MATLAB, C++, Python, ROS, Gazebo.