

Shijie Gao

PHD STUDENT · COMPUTER ENGINEERING

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Education

University of Virginia

PH.D., COMPUTER ENGINEERING

Charlottesville, VA

Expected Fall 2023

- Advisor: Dr. 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

PUBLISHED

- [1] 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.
- [2] **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.
- [3] 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.
- [4] 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
- [5] 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.
- [6] 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.
- [7] **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.

IN REVIEW

- [1] **S. Gao**, E. Yel, N. Bezzo. "Meta-Learning-based Proactive Online Planning for UAVs under Degraded Conditions", under review for submission to IEEE Robotics and Automation Letters(RA-L)

Professional Experience

Fall 19', 20', 21' **Autonomous Mobile Robot**, Graduate Teaching Assistant
Sep. 2019 **2nd Place Presenter**, ECE Student Research Poster Session