Shijie Gao

PhD Student · Computer Engineering

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Education

University of Virginia *Charlottesville, VA*

Ph.D., Computer Engineering *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 *Beijing, China*

B.S,. Automation *Aug. 2013 - July 2017*

University of California Berkeley *Berkeley, CA*

Exchange Student *Aug. 2016 - May 2017*

Research Experience

University of Virginia *Charlottesville, VA*

Graduate Research Assistant *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]**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.

Professional Experience

	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'	**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, 20'	**Presenter**, UVA Link Lab Student Flash Talks
Fall, 19'	**Finalist**, UVA Engineering Research Innovation Award(RIA)