Bo Fu

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EDUCATION

University of Michigan **Ann Arbor, MI**
Ph.D. in Robotics *Aug 2019 - Present*
Carnegie Mellon University **Pittsburgh, PA**
Master of Science in Mechanical Engineering (Research in Robotics) *Aug 2017 - May 2019*

RELATED SKILLS

C/C++, Python, Java, Matlab/Simulink, LaTeX, ROS, Gazebo, OpenCV, PyTorch, Gurobi, OR-Tools
Mixed-integer programming, graph-based optimization, deep/reinforcement learning, computer vision

WORK EXPERIENCE

Amazon Robotics **North Reading, MA**
Applied Scientist II Intern *May-Aug 2023*
- Developed efficient path planners and schedulers for the multi-robot systems to reorganize the storage racks in Amazon warehouses [context video]

SELECTED RESEARCH PROJECTS

Downward Visual-Inertial Localization for Unmanned Aerial Vehicles *Sep 2017-May 2019*
Advisor: Prof. Nathan Michael, Carnegie Mellon University
- Built a state estimator based on a downward camera and laser for high-speed (150 Hz) closed-loop control.
- Developed a homography based visual odometry algorithm that improves the accuracy and robustness.

Resilient Robot Teaming in Uncertain Environments *June 2019-Present*
Advisor: Prof. Kira Barton, Prof. Maani Ghaffari, University of Michigan
- Establish a learning model to estimate the robot capabilities and task requirements for task allocation.
- Develop a planner that optimizes time/energy and generates teams, routes, and task schedules.
- Develop a partial replanning mechanism to tackle real-time uncertainties and disturbances.

Human-robot Matching and Routing for Multi-robot Tour Guiding *June 2021-Present*
Advisor: Prof. Kira Barton, Prof. Maani Ghaffari, University of Michigan
- Develop a behavioral model that estimates reward functions based on human needs for tour guiding.
- Formulate a scalable algorithm that optimally matches humans with robots and generates the tour and schedules

SELECTED PUBLICATIONS

- **B. Fu**, et al., "Learning task requirements and agent capabilities for multi-agent task allocation," *arXiv preprint arXiv:2211.03286*, 2022. [PDF] [Video] [Code]
- **B. Fu**, et al., "Rad-VIO: Rangefinder-aided downward visual-inertial odometry," in *2019 International Conference on Robotics and Automation (ICRA)*. IEEE, 2019. [PDF] [Video]
- **B. Fu**, et al., "Robust task scheduling for heterogeneous robot teams under capability uncertainty," *IEEE Transactions on Robotics*, 2022. [PDF] [Video] [Code]
- **B. Fu**, et al., "Simultaneous human-robot matching and routing for multi-robot tour guiding under time uncertainty," *Journal of Autonomous Vehicles and Systems*, 2021. [PDF] [Video] [Code]
- **B. Fu**, et al., "Heterogeneous vehicle routing and teaming with Gaussian distributed energy uncertainty," in *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2020. [PDF]