

Bo Fu

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EDUCATION

University of Michigan

Ph.D. in Robotics

Ann Arbor, MI

Sep 2019 - Present

- **Research interest:** multi-agent task allocation, robot teaming, discrete optimization, scheduling and routing

Carnegie Mellon University

Pittsburgh, PA

Master of Science in Mechanical Engineering (Research in Robotics)

Sep 2017 - May 2019

Tongji University

Shanghai, China

Bachelor of Engineering in Vehicle Engineering (Automotive Electronics)

Sep 2012 - Jul 2017

SELECTED PUBLICATIONS

- **B. Fu**, et al., “Simultaneous human-robot matching and routing for multi-robot tour guiding under time uncertainty,” *Journal of Autonomous Vehicles and Systems*, vol. 1, no. 4, p. 041005, 2021. [\[PDF\]](#) [\[Video\]](#)
- M. Deng, **B. Fu**, et al., “Room match: Achieving thermal comfort through smart space allocation and environmental control in buildings,” *Winter Simulation Conference (WSC)*. IEEE, 2021, pp. 1-11. [\[PDF\]](#)
- **B. Fu**, et al., “Robust task scheduling for heterogeneous robot teams under capability uncertainty,” *arXiv preprint arXiv:2106.12111*, 2021. [Under review] [\[PDF\]](#) [\[Video\]](#)
- **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, pp. 4315-4322 [\[PDF\]](#)
- **B. Fu**, et al., “Rad-VIO: Rangefinder-aided downward visual-inertial odometry,” in *2019 International Conference on Robotics and Automation (ICRA)*. IEEE, 2019, pp. 1841–1847. [\[PDF\]](#) [\[Video\]](#)

SELECTED RESEARCH PROJECTS

Resilient Vehicle Teaming in Uncertain Environments

June 2019-Present

Advisor: Prof. Kira Barton, Prof. Maani Ghaffari, University of Michigan

- Establish a learning model to estimate the vehicle capabilities and task requirements for task allocation.
- Develop a planner that optimizes user-defined objectives and generates teams, routes, and schedules for tasks (*largest case tested: 140 agents and 40 tasks, solved within 120 sec, optimality gaps < 10% for most cases*).
- Develop a replanning mechanism that partially updates the plan in real-time under uncertainty 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 in tour guide scenarios
- Formulate a scalable algorithm that optimally matches humans with robots and generates the tour and schedules for tour guide tasks (*largest case tested: 50 robots, 250 humans, and 50 tour places, solved within 120 sec*)

Multicopter Downward Visual-Inertial Tracker

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

RELATED SKILLS

C/C++, Python, Matlab/Simulink, LaTeX, ROS, OpenCV, PyTorch, Gurobi, OR-Tools

Discrete stochastic optimization, graph-based optimization, deep learning, reinforcement learning