

# Bo Fu

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## EDUCATION

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### University of Michigan

*Ph.D. in Robotics*

**Ann Arbor, MI**

*Aug 2019 - Present*

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

### Carnegie Mellon University

**Pittsburgh, PA**

*Master of Science in Mechanical Engineering (Research in Robotics)*

*Aug 2017 - May 2019*

### Tongji University

**Shanghai, China**

*Bachelor of Engineering in Vehicle Engineering (Automotive Electronics)*

*Sep 2012 - Jul 2017*

## SELECTED PUBLICATIONS

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- **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., "Robust task scheduling for heterogeneous robot teams under capability uncertainty," *IEEE Transactions on Robotics*, pp. 1-19, 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*, vol. 1, no. 4, p. 041005, 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, 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

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### 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 task schedules (*largest case tested: 140 agents and 40 tasks, within 120 sec*).
- 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 (*largest case tested: 50 robots, 250 humans, and 50 tour places, 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

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

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