Bowen Fang

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Research Interests

I develop scalable systems and RL-based agentic reasoning frameworks for stochastic, continuous environments with complex topological constraints.

Keywords: reinforcement learning, agentic AI, multimodal reasoning (LLM/VLM), systems resilience, optimization.

Education

Columbia University   New York, NY
Ph.D. Candidate   *Aug. 2024 – Present*
- Advisor: Prof. Xuan (Sharon) Di

Columbia University   New York, NY
M.S. in Operations Research   *2022 – 2024*
Peking University   Beijing, China
B.S. in Big Data Management and Applications (Minor in Economics)   *2018 – 2022*

Research & Industry Experience

AWS AI Lab, Amazon   Incoming Summer 2026
Applied Scientist Intern (Return) – Post-Training & Agentic RL   *Seattle, WA*
AWS AI Lab, Amazon   May 2025 – Aug. 2025
Applied Scientist Intern – RL post-training   *New York, NY*
- Developed an RL-based post-training framework (RLVR-style) for large language models, improving reasoning accuracy while maintaining capacity.
- Set up VeRL training for math reasoning tasks, handling datasets, configs, checkpoint sync to S3, and profiling rollout performance.

Data Science Institute, Columbia University   2024 – Present
Graduate Researcher   *New York, NY*
MathWorks   Aug. 2022 – Dec. 2022
Part-time Data Scientist   *New York, NY*
AI TOPIA   Sep. 2021 – Jun. 2022
Research Engineer Intern   *Beijing*
Nomura   Jul. 2021 – Sep. 2021
Data Scientist Intern   *Shanghai*
Deloitte   Aug. 2020 – Oct. 2020
Data Scientist Intern   *Beijing*

Selected Publications

[1] **B. Fang** and X. Di, "Efficient consistency model training for policy distillation in reinforcement learning," in *ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy*, 2025. 📄

[2] **B. Fang**, X. Chen, Z. Pan, and X. Di, "Slamuzero: Plan and learn to map for joint slam and navigation," in *Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS)*, 2024. 📄

[3] **B. Fang**, Z. Yang, and X. Di, "Travellm: Could you plan my new public transit route in face of a network disruption?" In *Proceedings of the IEEE Intelligent Transportation Systems Conference (ITSC)*, 2025. 📄

[4] **B. Fang**, X. Chen, and X. Di, "Learn to tour: Operator design for solution feasibility mapping in pickup-and-delivery traveling salesman problem," in *Proceedings of the IEEE Intelligent Transportation Systems Conference (ITSC)*, 2025. 📄

Preprints & Under Review

[5] **B. Fang**, H. Pei, and L. Lausen, *Decaying budget forcing: A simple and effective reinforcement learning approach for balancing accuracy and capacity in mathematical reasoning*, *In submission to ACL Rolling Review*, 2026.

[6] **B. Fang**, R. Zha, and X. Di, "Do math reasoning llms help predict the impact of public transit events?" *arXiv preprint*, 2025, *Under review at Transportation Research Part C (Special Issue: Foundation Models and Large Language Models in Urban Mobility)*. 📄

Selected Projects

VeRL-Tune 2025 – Present
Scalable HPO and evaluation pipeline integrating VeRL with Ray Tune for agentic RL/LLM reasoning
SINA 2024 – Present
Offline indoor AR evacuation system requiring no network, Bluetooth, or stored maps on the Phone
Muax ⓞ 2023 – Present
JAX/TF MuZero implementation bridging DeepMind's MCTX with Acme

Teaching Experience

Columbia University 2023
Teaching Assistant, IEOR E4004 Optimization Models and Methods *New York, NY*
- Graduate course on linear, integer, nonlinear, and dynamic programming. ↗

Columbia University 2025
Teaching Assistant, CIEN E4011 Big Data in Transportation *New York, NY*
- Graduate course on large-scale transportation data and modern ML tools (JAX, Google Cloud, etc.). ↗

Honors & Awards

CS3 VALIDATE Accelerator Winner 2025
NSF I-Corps Travel Grant 2025
Calatrava Family Fellowship 2024

Technical Skills

Languages: Python, C++, SQL, MATLAB.
ML & RL: JAX, PyTorch, TensorFlow, Hugging Face, vLLM; VeRL, Ray/RLlib, Acme, mctx, OpenSpiel.
Data & Infra: NumPy/Pandas, SciPy, scikit-learn, XGBoost, Apache Spark; Docker, Kubernetes, Slurm, Airflow.
Cloud & Tools: AWS, GCP; Linux, Git.

Professional Service

Reviewer: Transportation Research Board; Transportation Research Part C: Emerging Technologies.
Workshop Organization: Urban Mobility AI Workshop, Columbia University (2024).