

Bowen Fang

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EDUCATION

Ph.D. Student, School of Engineering and Applied Science, **Columbia University**, New York, NY 2024-present

- Focus: Reinforcement Learning
- GPA: 4.1
- Advisor: Sharon Di
- Relevant courses: Diffusion Models AI & RL, Quantum Computing and Communication

M.S. in Operations Research, **Columbia University**, New York, NY Dec 2023

- GPA: 4.13
- Relevant courses: Advanced Big Data and AI, ML and High-dimensional Analysis, Robot Learning, Optimization, Stochastic Models

B.Mgt in Big Data Management and Application, **Peking University**, Beijing China Sep 2018 - Jul 2022

- GPA: 3.5
- Relevant courses: Algorithms and Data Structure, Database

INDUSTRY EXPERIENCE

Applied Scientist, AWS, New York, NY May 2025 – Aug 2025

- Developed a novel RLVR algorithm for mathematical reasoning, boosting pass@1 accuracy by 9% over the base Llama and QWen and outperforming the state-of-the-art DAPO by 7% on pass@k.
- Implemented a custom off-policy rollout mechanism in verl to maintain model entropy at ~6.0 (vs. <1.0 in standard methods) to ensure training stability and effectiveness.
- Automated the deployment and management of a multi-node (3x8 A100 GPUs) distributed training cluster on AWS, leveraging vllm for efficient inference.

Part-time Data Scientist, **MathWorks**, New York, NY Aug 2022 - Dec 2022

- Reproduced **Dynamic Programming** for Goal-based Wealth Management, developed 4 reward signals, devised experiments with 6 model-free agents to discover the best algorithm
- Achieved an increase of success rate from 41% to 61%, compared to **Q-Learning** baseline, the success rate is -0.07 from theoretical best probability. A blog with code was published officially and **added into MATLAB toolbox** [\[blog\]](#)

Machine Learning Research Engineer Intern, **AI TOPIA**, Beijing, China Sep 2021 - Jun 2022

- Proposed learning algorithms to optimize execution cost for intraday order placement optimization. Implemented 5 **model-free algorithms** and a high frequency trading environment
- Utilized advanced models including **DeepLOB** and XGBoost to improve the short-term prediction. Realized on average 2-ticks better price for tick-level order placement

Quant Analyst Intern, **Nomura Orient International Securities**, Shanghai, China Jul 2021 - Sep 2021

- Perfected our **FOF website platform**. Built **dashboard and SQL database** for metrics include style and systematic risk
- Realized a new feature in **MongoDB** and a **web crawler**, which has been **added to the department's core codebase**

Data Scientist, Intern, **Deloitte**, Beijing, China Aug 2020 - Oct 2020

- Completed a **web crawler** project and automatically produced formatted excel spreadsheet weekly
- Collaborated with data scientists on the **interactive data visualization**, preprocessed fundamental data for **business intelligence dashboard** products

PUBLICATIONS AND PREPRINTS

Decaying Budget Forcing: A Simple and Effective Reinforcement Learning Approach for Balancing Accuracy and Capacity in Mathematical Reasoning

Bowen Fang, Hengzhi Pei, Leonard Lausen (in submission to ACL)

Efficient Consistency Model Training for Policy Distillation in Reinforcement Learning

Bowen Fang, Xuan Di *ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy*
[Paper]

SLAMuZero: Plan and learn to Map for Joint SLAM and Navigation

Bowen Fang, Xu Chen, Zhengkun Pan, Xuan Di *Proceedings of the International Conference on Automated Planning and Scheduling, ICAPS 2024*
[Paper], [Code]

Learn to Tour: Operator Design to Unlock Feasibility Mapping

Bowen Fang, Xu Chen, and Xuan Di *ITSC 2025*
[arxiv]

TravelLM: Could you plan my new public transit route in face of a network disruption

Bowen Fang, Yang Zixiao, and Xuan Di *ITSC 2025*

MetaLLMetro: LLM-Centric Virtual Reality Navigation Platform for Metro Stations

Yongjie Fu, **Bowen Fang**, Mengxuan Liu, Xuan Di, *ITSC 2025*

PROJECT EXPERIENCE

SINA: Seamless, Intelligent Navigation Anywhere

NY, United States

- Awarded first place in the CS3 VALIDATE accelerator, securing grant funding to develop a next-generation emergency response and navigation platform.
- Pioneered a modern emergency response method, now U.S. Patent Pending, that intelligently routes users based on tiered environmental and network signals.

Python Open-source Library Muax[code]

NY, United States

- Implemented variants of **MuZero** with **JAX/TensorFlow**, supported **distributed RL** and **distributed training**
- Integrated with DeepMind's **Acme** framework, compared **MCTS** search policies on **Open Spiel** multi-agent games (e.g., Go)

SLAMuZero[code]

NY, United States

- Enhanced **MuZero** perception with **SLAM** for **embodied AI**, experiment on Meta's **Habitat simulator**
- Realized comparable performance for indoor **exploration** tasks on Gibson dataset, with better sample efficiency

LLM Agent Navigation in VR Unity

NY, United States

TECHNICAL SKILLS

- Languages: Python, SQL, C++, C#, Java, JavaScript, HTML/CSS, MATLAB
- Machine Learning:
 - Deep Learning: JAX, PyTorch, TensorFlow, Hugging Face Transformers, vLLM
 - General ML & Vision: Scikit-learn, XGBoost, OpenCV
 - Reinforcement Learning: Acme, mctx (MuZero), verl, RLlib (Ray), stable baselines, OpenSpiel
 - Data Analysis & Visualization: Pandas, NumPy, SciPy, Matplotlib, Seaborn, Plotly
- Data & MLOps: Apache Spark, Docker, Airflow, MongoDB
- Cloud Platforms: Amazon Web Services (AWS), Google Cloud Platform (GCP)
- Developer Tools: Git, Linux, Unity, XCode (iOS)

HONORS AND AWARDS

NSF Center for Smart Streetscapes Validator Award
Calatrava Family Fellowship

2025
2024

PRESENTATIONS

- Learn to Tour: Operator Design for Solution Feasibility Mapping, INFORMS, Phoenix, United States, 2023

- SLAMuZero: Plan and learn to Map for Joint SLAM and Navigation, ICAPS, Banff, Canada, 2024

PROFESSIONAL SERVICE

Reviewer

- Transportation Research Board
- Transportation Research Part C: Emerging Technologies

Workshop Organization

- Student Assistant, Urban Mobility AI Workshop, Columbia University, 2024
 - Developed and maintained workshop website with **HTML/CSS/JS**, Assisted in organization and coordination
 - Workshop URL: [[Homepage](#)]

TEACHING EXPERIENCE

Teaching Assistant, IEOR department, **Columbia University**, New York, NY

2023

- Graduate Optimization Models and Methods (IEOR E4004) instructed by Cedric Jozs
- Self-motivated to enhance final project on **Moving Object Detection**, created sample videos and code templates for quick start[[summary](#)]