YINGHAO FU

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EDUCATION

The Chinese University of Hong Kong, Shenzhen Shenzhen, China
Master of Science in Bioinformatics Sept 2022 – Mar 2024

- Overall GPA: 3.82/4.0, Rank: **Top 1/37**

East China University of Technology (ECUT), School of Science Nanchang, China
Bachelor of Science in Statistics (Big Data Stream) Sept 2018 – July 2022

- Average Score: 89.07/100, Rank: **Top 3/80**
- Scholarships:
  ECUT Outstanding Graduate (3/100, Fall 2021)
  ECUT Second-class Scholarship (Fall 2021)
  Star of Entrepreneurship and Innovation (1/500, Spring 2021)
  ECUT Second-class Scholarship (Fall 2020)
- Competition Awards:
  Finalist Prize, Interdisciplinary Contest In Modeling (2020)
  First Prize in Jiangxi, National University Students Mathematics Modeling Contest (2020)
  Second Prize, Jiangxi "Huangchuang Cup" Market Survey and Analysis Competition (2020)

PUBLICATIONS

*Co-first author

Cao, C. *, **Fu, Y. ***, Xu, S., Zhang, R., & Li, S. (2024). *Enhancing Human-AI Collaboration Through Logic-Guided Reasoning*. International Conference on Learning Representations (ICLR).

Fu, Y.*, Cai, Q.*, Lyu, C.*, Rao, S., Bai, Y., Alvarze, J., Kang, J., & Yu, T. (2024). *A New Framework for Exploratory Network Mediator Analysis in Omics Data.* Genome Research.

Fu, Y., Tian, L., Wang, Y., & Zhang, W. (2024). *STsisal: A Reference-Free Deconvolution Pipeline for Spatial Transcriptomics*. BMC Bioinformatics. Under the second review.

Xia, W., **Fu, Y.**, Shi, J., Wu., H., & Wang, J. (2021). *The Team Winning Analysis Model Based on Network and Entropy Weight.* Paper presented at the 40th Chinese Control Conference, Shanghai.

Cao, C., **Fu, Y.**, & Li, S. (2024). Discover Logic-informed Intrinsic Rewards To Explain Human Policies. International Conference on Machine Learning (ICML). Under review.

Yang, Y., Yang, C., Li, B., **Fu, Y.**, & Li, S. (2024). Neural-Symbolic Temporal Point Process. International Conference on Machine Learning (ICML). Under review.

RESEARCH EXPERIENCE

Neural-Symbolic Temporal Point Process May 2023-Present
Co-author, supervised by Shuang Li, The Chinese University of Hong Kong(Shen Zhen), **submitted to ICML 2024**

- Introduce a neural-symbolic rule induction framework within the temporal point process model to efficiently discover a compact set of temporal logic rules to explain irregular events of interest

Discover Logic-informed Intrinsic Rewards To Explain Human Policies May 2023-Oct 2023
Co-author, supervised by Shuang Li, The Chinese University of Hong Kong(Shen Zhen), **submitted to ICML 2024**

- Presented a novel IRL framework that simultaneously learns experts' logical reasoning processes and policies from observational data, enhancing interpretability compared to black-box solutions.

Enhancing Human-AI Collaboration Through Logic-Guided Reasoning May 2023-Oct 2023
Co-first author, supervised by Shuang Li, The Chinese University of Hong Kong(Shen Zhen), **ICLR accepted**

- Proposed a logic-guided reasoning framework to equip AI agents with the ability to infer the goals of other actors by observing their past and current behaviors.

A New Framework for Exploratory Network Mediator Analysis in Omics Data Sept 2022-Sept 2023
Co-first author, supervised by Tianwei Yu, The Chinese University of Hong Kong(Shen Zhen), **Genome Research under revision** (Github: https://github.com/EddieFua/medNet)

- Developed an R package medNet to identify associations between multi-omics data

- Conducted simulation experiments to valid the effectiveness of our method, and detected potential mediators and mediator networks of the breast cancer dataset and metabolite dataset, validated through subsequent experiments
- Implemented parallel computation algorithms to optimize computational processes

STsisal: A Reference-Free Deconvolution Pipeline for Spatial Transcriptomics May 2022-June 2023
First author, supervised by Weiwei Zhang, The Chinese University of Hong Kong(Shen Zhen), **BMC Bioinformatics under review** (Github: https://github.com/EddieFua/STsisal)

- Developed a pipeline of deconvolution for spatial transcriptome without relying on a single-cell dataset.
- Conducted a simulation experiment and apply our method to five public data to validate its robust performance, comparing it with the existing reference-free method (STdeconvolve) and reference-based methods (RCTD and CARD)

The Team Winning Analysis Model Based on Network and Entropy Weight Sept 2020-Dec 2020
Second author, supervised by Professor Jihui Wang

- Adopted 20,000 passes for the Husky football team in 38 games and applied the Pagerank algorithm to the field of sports and formulated the passing network based on the flow of each passing node
- Utilized the entropy weight method to analyze the 38 games data analysis of the Husky team and concluded the key factors of winning the team

INTERNSHIP EXPERIENCE

The Chinese University of Hong Kong (Shenzhen) Shenzhen, China
Research assistant, supervised by Prof. Li Shuang July 2023 – Present

- Conducted research on decision-making, logic learning, and behavior modeling

JDL Express Shanghai, China
Warehouse network planning, Planning Department Jan 2022 – Mar 2022

- Analyzed the data of each warehouse of JDL and evaluated the efficiency of the warehouse network
- Built the model that can optimize the warehouse and product

Shanghai University Shanghai, China
Research assistant, Air Quality Modeling Group July 2021 – Aug 2021

- Carried out data collection, data analysis, and visualization using python

Caitong Securities Co., LTD Jinhua, China
Business assistant, Security Business Department July 2020 – Aug 2020

- Studied the industry and companies and wrote in-depth reports
- Analyzed the investment value of the stocks based on the investment value of the company, established and maintained the basic stock pool and the core stock pool, and offered timely adjustment suggestion

LEADERSHIP EXPERIENCE

Group Director, National University Students Mathematics Modeling Contest. Sept 2020-Oct 2020

- Processed the financial data of small companies and established models
- Analyzed the credit risk and built a multi-objective programming model, offering the highest interest rates on the basis of the loan amount of the company
- Changed the lending strategy according to the ridge regression model and reduced the non-performing loan ratio

TALKS

Discovering Logic-informed Intrinsic Rewards to Explain Human Policies
POMS-HK 2024
The Hong Kong University of Science and Technology, 6th January, 2024

Designing a reinforcement learning agent to facilitate consensus among human doctors in rare disease treatment
EcoSta 2024
Beijing Normal University, 17th -19th July, 2024 (forthcoming)

REFEREES

Prof.Tianwei Yu
E-mail: yutianwei@cuhk.edu.cn

Prof.Shuang Li
E-mail: lishuang@cuhk.edu.cn