Mingxuan He

Web3 Researcher & Data Scientist

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Profile

I am a crypto-native quantitative researcher and data scientist with rigorous academic and project experiences across TradFi and Web3. My greatest strength is the ability to make sense of complex algebraic formulas and big data then transform them into valuable, human-readable information through written and oral reports. My interest lies broadly in DeFi and tokenomics.

Core skills: quantitative research, machine learning, computational simulation, onchain analytics, technical writing

Education

University of Chicago *Chicago, IL*

M.A. in Computational Social Science – Economics *Aug 2022 – May 2024*

- Advisor: Dr. Gina Pieters
- Thesis: Dynamic Modeling for Optimal Cryptoeconomic Policies

Grinnell College *Grinnell, IA*

B.A. in Mathematics and B.A. in Economics with Honors *Aug 2018 – May 2022*

- Advisors: Dr. Jennifer Pauhlus, Dr. Keith Brouhle

Experiences

Nethermind

Research & Data Science Intern *Jun 2023 – Sep 2023*

Worked with Nethermind's research team on open-ended / on-demand research projects related to DeFi and cryptoeconomics

- LSD Modeling: Developed an agent-based modeling & simulation framework for liquid staking protocols
- Lido Validators: Researched and co-developed mechanisms against white-labels in Lido's validator network; designed architecture for a zero-knowledge machine learning (zkML) classifier model to detect white-labels
- Institutional Research: Produced data-driven research reports on emerging DeFi topics for a top-tier institutional client

Polygon

Research Analyst (DeFi) *Oct 2022 – Jun 2023*

- Conducted deep-dive analyses for over 20 decentralized perpetual futures (perp) exchanges; studied protocols' technical and economic aspects including risk profiles and detailed collateral, liquidity, and funding mechanisms and synthesized them into internal documentation.

ELBICA Lab

Undergraduate Researcher *Jun 2021 – Sep 2021*

- Led a group of three students to study evolutionary game theory on complex networks; designed and developed multi-agent machine learning systems in *Python* using *networkx*; conducted experiments on various network topologies and model parameters; compiled, analyzed, and visualized experiment data

Research Papers

Working Papers

He, M. (WIP) Dynamic Modeling for Optimal Cryptoeconomic Policies.

Published Papers

He, M., Gao, M., Gao, Y., & Eliott, F. M. (2022). Cascading Failures and the Robustness of Cooperation in a Unified Scale-Free Network Model. In *Complex Networks & Their Applications X*, 2022. Springer, Cham. https://doi.org/10.1007/978-3-030-93413-2_31

Short Papers and Research Reports

Short papers and research reports are available here: `https://mingxuanhe.xyz/projects`

Research blogs and threads are available here: `https://mingxuanhe.xyz/writings`

Presentations

He, M. (2023) Post-Shanghai Liquid Staking Derivatives and Bank Run Risks. Science of Blockchain Conference (SBC) Decentralized Financial Stability Forum, Stanford University, Palo Alto, U.S.

He, M. (2023) Post-Shanghai Liquid Staking Derivatives and Bank Run Risks. ETHChicago, Chicago, U.S..

He, M. (2023) Workshop on Agent-Based Simulations for Protocol Design, Tokenomics, and Risk Analysis. ETHChicago, Chicago, U.S..

He, M., Gao, M., Gao, Y., & Eliott, F. M. (2021). Cascading Failures and the Robustness of Cooperation in a Unified Scale-Free Network Model. International Conference on Complex Networks and their Applications (ICCNA21), Polytechnic University of Madrid, Madrid, Spain.

Professional Services

Uniswap Foundation

Founding member, MEV+UX Working Group *Oct 2023 — Present*

- Invited as a founding member of new research group working on solutions to UX issues related to DeFi MEV
- Collaborated with researchers from multiple disciplines to foster theoretical and data-driven approaches to MEV challenges

ETHChicago *Chicago, IL, U.S.*

Community Co-organizer *Sep 2023*

- Facilitated organization of the inaugural event through professional outreach and network collaborations
- Gave a presentation and hosted an hour-long hackathon workshop aimed at upskilling hackathon participants

Grants and Awards

2023	**Gitcoin Grants 18**, Gitcoin & Token Engineering Commons	*$ 3,500*
2023	**Nethermind Internship Stipend**, Ethereum Foundation Ecosystem Support Program	*$ 3,000*
2022, 2023	**Phoenix Graduate Merit Scholarship**, University of Chicago	*$ 52,000*
2021	**MAP Research Grant**, Grinnell College	*$ 3,000*

Teaching Experiences

2022	**Onchain data analytics mentor / judge**, Blockbeam DeFi Bootcamp
2021	**Intermediate microeconomics mentor**, Grinnell College
2018-2021	**Co-founder and SAT tutor**, Peer Insight Education

Languages and Tools

Computing languages: Python, Matlab, Stata, SQL, Julia, LaTeX

Libraries: numpy, pandas, scipy, sklearn, statsmodels, xgboost, matplotlib, seaborn, plotly, mesa, networkx, sympy, spark, dask, flask, solara

Platforms & tools: Git/Github, Dune, Flipside, AWS, Conda, Google Colab, Heroku, MPI, OpenCL

Natural languages: Mandarin (native), English (fluent), French (beginner)