Xinghong Fu

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Education

Massachusetts Institute of Technology **Sep 2022 – present**
S.B. candidate in Mathematics with Computer Science *GPA: 5.0/5.0*
Selected Coursework: Machine Learning (G), Deep Generative Models (G), Computer Vision (G), Software Construction, Advanced Algorithms (G), Probability (G), Statistics(G), Quantum Computation (G), Computation Structures

Selected Work Experience

Jump Trading: Incoming Quantitative Research Intern *June 2025 - Aug 2025*
Preferred Networks: Machine Learning Research Intern *June 2024 - Sep 2024*
Developed a 200M financial time series foundation model in JAX for the task of price prediction with multi-GPU training. Purely single-variate autoregressive signals generated 1.68 sharpe ratio, allowed for 60 b.p. trading. Publication in IEEE-SSCI 2025.
LINE: Software Engineering Intern *Jul 2023 - Aug 2023*
Worked on detecting anomalies in live API metrics data. Wrote PromQL queries to obtain datasets for training of clustering algorithms. Reduced online computational cost using exponential smoothing, implemented live on a Kubernetes cluster using Helm charts.
Alphalab Capital: Quantitative Research Intern *May 2023 - Jul 2023*
Designed statistical arbitrage strategies for cryptocurrency linear perpetuals based off Reddit sentiment analysis data collected through natural language processing; backtesting results over 3 year duration achieved 50% annualized returns and Sharpe ratio 4.0
Victoris Education Group: Co-Founder *Nov 2021 - Jul 2022*
Founded an education group providing academic enrichment programmes to Singapore students. Connected 150 students with 20 tutors. Oversaw admin operations and individually managed up to 10 sessions weekly.
Singapore Armed Forces: Finance Administrator (mandatory military service) *Jan 2020 - Nov 2021*
Managed accounting, procurement, and finances for a 200-men battalion. Facilitated purchases in activities ranging from daily operations within the battalion to the nation-wide National Day Parade.

Research and Publications

- **Video World Models (UC Berkeley, Meta)**
  Mechanistically interpreting how physical motions are encoded in video generation models.
- **Lagrangian-Hamiltonian Neural Networks (Tegmark Lab)**
  Mechanistic interpretability of LLMs and developing new architectures in physics-inspired AI. First author publication
- **Building Socio-Emotional Generative Agents (Yang Lab)**
  Incorporating RL heuristics with LLM architecture to develop agents capable of socially intelligent interactions; constructing benchmarking metrics for performance measurement of behavior of individual and multiple agents.
- **Dynamic trajectory and parametric resonance in coupled pendulum-beam system**
  Independently developed a numerical model of a complex physical system in Mathematica which achieved perfect agreement with experimental data. Published as Editor's Pick in monthly issue.

Skills and Languages

Python, PyTorch, Mathematica: Proficient (> 2 years)
C, C++, C#, Matlab, Javascript: Intermediate (1 year)
Foreign languages: Mandarin Chinese (Native), Japanese (Proficient; JLPT N2 180/180)

Projects and Competitions

Implementation project: Vision Transformer/Diffusion Transformer *Feb 2024*
- Fully implemented from scratch a ViT and DiT in JAX on TPU v3/v4, replicating SOTA results.

Weaver: HackMIT 2022 sponsor prize winner (multiple listed below) *October 2022*
- Built a decentralized mobile matchmaking app using Flutter SDK on the Solana blockchain
- Implemented machine learning algorithms on Intersystems, predicted user matches with an accuracy of 0.85
- Winner of multiple sponsor prizes: 1^{st} place - JumpCrypto, 2^{nd} place - Intersystems, 2^{nd} place - Solana

Quantum Blockchain: HackBoston 2022 sponsor prize winner: 2^{nd} place - Cartesi *September 2022*
- Linked blockchain with quantum technology by retrieving on-chain data to run on the IBM quantum computer

Corona in a Box: CodeForCorona (Singapore) winner: 3^{rd} place overall *May 2020*
- Coded a simulation game in Unity using C# to educate players on rates of disease transmission

Selected Awards and Achivements

International Physics Olympiad Gold Medallist: Rank 15/364 *Jul 2019*

Lee Kuan Yew Award for Mathematics and Science: *Aug 2018 & Aug 2020*
Prestigious national awarded to top Mathematics and Science students in Singapore.

International Young Physicists' Tournament: Overall Champions *July 2016 – July 2018*
Conducted research into 17 open-ended physics problems and presented the solutions to a distinguished international jury panel. Ranked first out of more than 30 countries for two consecutive years of participation.