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: 6.122 Algorithms II, 18.675 Probability (G), 18.650 Statistics, 6.790 Machine Learning (G), 8.370 Quantum Computation (G), 18.404 Theory of Computation, 18.702 Algebra II, 18.600 Probability

Skills and Languages

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

Selected Work Experience

LINE: Software Engineering Intern   *Jul 2023 - Sep 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; 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.

Projects and Competitions

MIT Pokerbots: rank 14th/96 teams   *January 2023*
- Built a Python bot that played a variant of heads-up poker against opponent bots; overall win rate of 73%.

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: 1st place - JumpCrypto, 2nd place - Intersystems, 2nd place - Solana

Quantum Blockchain: HackBoston 2022 sponsor prize winner: 2nd 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: 3rd place overall   *May 2020*
- Coded a simulation game in Unity using C# to educate players on rates of disease transmission

Selected Awards and Achivements

Physics Brawl Online: Team Rank 2/1037   *Nov 2022*
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 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.

Research and Publications

- **Building Socio-Emotional Generative Agents**
  Incorporating LLMs with hierarchical RL to develop agents capable of socially intelligent interactions; constructing benchmarking metrics for performance measurement of agent behavior.
- **GAILA - GPT-based AI Language Assistant**
  Developed a GPT-3 based prototype language learning assistant through prompt engineering, capable of providing personalized feedback to students' essays in written and audio form, under the guidance of Dr Takako Aikawa.
- **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.
  ref:beam. doi:10.1119/10.0001389.