Rae Wong Ying Yee

Systems and Machine Learning

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Senior Thesis

"Optimizing Machine Learning computation on Distributed Systems"

My final year thesis explores distributed inference systems for deep neural networks to minimize latency without sacrificing accuracy. One application is in dynamic DNNs that suffer from load imbalance and excessive all-to-all communications. We built an asynchronous inference system with better task allocation to tackle this problem. Other strategies explored include writing efficient kernels and speculative inference. Our system is benchmarked using popular language models such as the LLaMa model released this year.

Work Experience

MAY 2023 - AUG 2023

Virtu Financial
Software Engineering Intern Incoming

- Working on trading systems in C++.

MAR 2023

Traders at Berkeley
Berkeley Trading Competition Second Place

- Ranked second individually out of 110 participants over the 3-day competition.
- Won second in a team kaggle contest and learnt trading strategies from sponsoring firms including Citadel, Optiver, Jane Street, HRT and Jump Trading.

JAN 2023 – CURRENT

Carnegie Mellon University
Teaching Assistant 15-259 : Probability and Computing

- Teach advanced probability concepts in a Citadel sponsored class for CS students.
- Write problems for assignments and exams, grade and host review sessions.

JAN 2022 – DEC 2023

Carnegie Mellon University
Teaching Assistant 15-210 : Parallel and Sequential Data Structures and Algorithms

- Teach parallel algorithms using functional programming (SML) in a core CS class.
- Research on parallel computing instrumentation by adding fast CUDA bindings.

MAY 2022 – AUG 2022

Open Government Products
Software Engineering Intern full stack developer on open source product

- Automated E2E smoke tests using Cypress, Gmail API and Twilio API and integrated them into the CI/CD pipeline, reducing deployment time by 20%.
- Built a custom html converter to enable copy-and-pasting of styles from MS Word to our rich text editor based off the Draft.js framework by Meta.
- Implemented search, filter and sort functions on the dashboard by introducing new frontend designs, backend APIs, sequelize queries and routing tests.

APR 2021 – DEC 2021

Carnegie Mellon University
ML Research Assistant Computer Music Lab

- Developed a model for music prediction and to further extract repetition patterns.
- Implemented Variable Order Markov Models to improve prediction results by 30%.
- Conducted confidence weighting to blend foreground and background learning, which incorporates song and genre specific information, boosting accuracy by 10%.

AUG 2020 – SEP 2020

Insignia Ventures Partners
Software Engineering Intern Web development

- Created a VC simulator to visualize ownership division per series of funding.
- Deployed an interactive version of the simulator as an online compute tool for all and benefited over 50 international startups by flagging out risks of fund raising.

Education

2023 – 24	**M.Sc. in Computer Science** **Stanford University**
2020 – 23	**B.Sc. in Computer Science** **Carnegie Mellon University** DEAN'S LIST HIGH HONORS GPA 4.0/4.0
2018 – 19	**Cambridge A-Levels** **Hwa Chong Institution** TOP IN COMPUTING 7 Distinctions, 90/90

Awards

Second Place, Berkeley Trading Competition

Thesis Honors, Carnegie Mellon

Summer Undergraduate Research Fellowship, Carnegie Mellon University

Bronze, Science Research Fair

Joint First in Nationals, International Mathematical Modelling Challenge

Championship and Best Defender, Cyber Defenders Camp CTF

Courses

15897	Parallelism and Concurrency
15451	Design and Analysis of Algorithms
15210	Parallel Algorithms
15259	Probability and Computing
15418	Parallel Computer Architecture
15440	Distributed Systems
15346	Computer Architecture
15411	Compiler Design

Skills

LANGUAGES	C/C++, Java, Python Rust, OCaml Javascript, Typescript
TOOLS	OpenCV AWS Node.js ReactJS, HTML/CSS

Extracurriculars

2022	**Outreach Coordinator** CMU Project Smile
2019	**Co-Chairperson** International Science Youth Forum