James Ngai

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Education

Carnegie Mellon University
BS Computer Science — *Aug 2022 – May 2025*
GPA: 3.88/4.0

Work Experience

Machine Learning Researcher — Jan 2023 – Present
Carnegie Mellon ZUZ Lab — *Pittsburgh, PA*

- Research under Professor Seth Goldstein in developing pricing algorithms for **multi currency crypto transactions**.
- Develop **Agent-Based Model** with **Reinforcement Learning** and **Game Theory** to simulate **real-world** trading.
- Reduced average **convergence time** by **43%** and increased **model reliability 26%** with Epsilon-Greedy **Q-Learning**.
- Implemented **Linux** script on **Google Cloud** for **automated hyperparameter testing**, improving lab's productivity.
- Named **National Science Foundation** Summer Undergraduate **Research Fellow**, awarded **$4500 grant** for **Machine Learning** research.

Teaching Assistant — Feb 2022 – Sept 2022
Expii/Daily Challenge/Po Shen-Loh — *Remote*

- Co-taught classes in **combinatorics** and **algebra** for **40** students doing **AMC** and **MATHCOUNTS** competitions.
- Accelerated TA training by **mentoring 10 junior TAs monthly**, fostering strong team cohesion for classes.

Software Engineer Intern — Jun 2018 – Jun 2022
Allstate Hale Insurance — *Seattle, WA*

- Led development of mailer ad software for **70,000** prospective clients **saving $10000 annually**.
- Corrected **15%** of all **ad data** by **cross-validating** SalesGenie housing data with King County **REST APIs** in **Python**.
- Improved **Ad Efficiency by 27%** with **XML Requests** and runtime by **75%** with **multithreading**.

Projects

eBay 2023 Machine Learning Competition — *PyTorch, AWS, Google Cloud* — Source Code Confidential

- Spearheaded **data preprocessing** and cleaning for the **eBay Machine Learning Challenge**, leveraging **Pandas** and **Hugging Face** to ensure **NLP model** compatibility.
- Optimized model training scripts using **LoRA**, **Quantization**, and **Deepspeed** to facilitate **efficient Multi-GPU training**, resulting in a **55% reduction** in memory consumption while preserving competitive performance levels.
- Conducted hyperparameter tuning and **K-Cross Fold Validation** on **11 billion parameter models** in distributed training setups on **AWS EC2** and **Google Cloud**.

11-785 PhD Deep Learning Capstone Project — *PyTorch, Reinforcement Learning, Data Preprocessing* — Source Code

- Directed a team of four to construct a **Reinforcement Learning** Agent project to solve Jigsaw reassembly challenges.
- Developed and implemented **PyTorch Dataclasses** and Datasets, streamlining code through concise structure.
- Improved model generalizability by integrating a **AlphaZero** and a **discriminator network**, surpassing established benchmarks in **both performance and adaptability**.

Technical Skills

Languages : Python, R, SQL, C/C++, Java, JavaScript, HTML, CSS, Git, Julia, Linux, LaTeX

Technologies : Pandas, Sklearn, GCP, AWS, TensorFlow, PyTorch, CUDA, MongoDB, Kubernetes, Spark

Relevant Coursework

11-785 PHD Intro Deep Learning , **15-213** Intro Computer Systems, **21-241** Linear Algebra, **21-266** Vector Calculus