

Irving Liang

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EDUCATION

Carnegie Mellon University

Aug 2021 – May 2025

B.S. in Computer Science (Minor in Machine Learning and Mathematics), GPA: 4.0/4.0

- **Courses:** Distributed Systems, Intro to Deep Learning (PhD), Intro to Machine Learning (PhD), Web Development, Linear Algebra, Probability, Statistical Inference, Mathematical Finance, Discrete Math, Multivariate Calculus
- **Awards:** Dean's List (High Honors), International Economics Olympiad Global Finalist (National Top 3)

EXPERIENCE

Diderot

May 2023 – Aug 2023

Software Engineer Intern

- Prompt-tuned GPT-4 model with OpenAI API with data from past semesters to answer student questions interactively
- Proposed a iterative-prefix segmentation algorithm on post threads to standardize data for consistent prompt format
- Constructed a chat-bot tutor backend in Python with CoT and self-verification prompt tuning, embedding space search for few-shot learning, and quality check for adversarial injection, improving system safety and user experience
- Deployed the system on AWS and constructed RESTful API for communications between client interface and the server

Robotics Institute - Carnegie Mellon University

Mar 2023 – Present

Research Assistant with Prof. Jeffrey Ichnowski

- Wrote Python scripts to configure BlenderCloth and generate compatible JSON files to automate experiment process
- Implemented new features for ParticleNeRF with Python and C++, including depth scaling, automated OBB finding, and real-time particle tracking, improved and visualized rendering results with a MSE of 0.18 on particle trajectories

Machine Learning Department - Carnegie Mellon University

Jan 2023 – May 2023

Undergraduate Researcher with Dr. Chirag Nagpal

- Researched on firm bankruptcy prediction using time-to-event analysis with neural networks based on corporate data
- Defined 2 types of event indicator to deal with data censorship and conducted data pre-processing and augmentation
- Designed training and evaluation pipeline with PyTorch and Scikit-Learn and conducted parallel grid search for hyper-parameter tuning on auton survival models, increasing prediction accuracy by over 5.8% than baseline models

Computer Science Department - Carnegie Mellon University

Aug 2022 – Present

Teaching Assistant of 15-210: Parallel and Sequential Data Structures and Algorithms

- Led recitation and office hour for 200+ students on advanced algorithm design & functional programming in SML/C++
- Course Tutor of 15-251: Great Ideas in Theoretical Computer Science
- Held weekly meetings with students on topics including Automata Theory, Graph Theory, and Randomized Algorithms

Human-Computer Interaction Institute - Carnegie Mellon University

Aug 2022 – Dec 2022

Web Developer

- Implemented an interactive web interface in HTML, CSS, JavaScript, and Vega to visualize performance of ML models

PROJECTS

Distributed Search Engine | Java : A large-scale text search engine supporting Boolean, BM25, and Indri retrieval models, with result diversification, query expansion, and SVM classifier to improve search result by 12% more relevant

Concurrent Web Proxy | C++ : A full-fledged web proxy that can process HTTP requests to servers and fetch content to clients, with multi-threading for concurrent requests and a dynamic cache to boost HTTP request by 60%

MyTorch[©] | Python : A custom deep learning library in pure NumPy with out-of-the-box usability, inspired by PyTorch, supporting MLP, CNN, RNN with gated recurrent units, and LSTM, with autodiff for efficient backpropagation

Speech Recognition Neural Network | Python : A LSTM-based model with LAS architecture for audio transcription, optimized with multi-head attention, Gumbel reparametrization, and Locked Dropout for a Levenshtein distance below 7

SKILLS

Languages/Libraries: Java, Python, C, C++, SQL, OCaml, shell, JavaScript, HTML, CSS, pandas, Numpy, PyTorch

Developer Tools/Frameworks: Git, AWS, Docker, Vim, Jupyter, MongoDB, WandB, React, Bootstrap, Node.js