

Kamal Chilukuri

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EDUCATION

THE UNIVERSITY OF CHICAGO

Master of Science in Computer Science

Chicago, IL

September 2023 - December 2024 (Expected)

- Concentration: Machine Learning, Statistics, Finance

PURDUE UNIVERSITY

Bachelor of Science in Computer Science (Minor in Mathematics)

West Lafayette, IN

August 2020 - May 2023

- Concentration: Machine Learning

PROFESSIONAL EXPERIENCE

Staples

Boston, MA

Machine Learning Engineer Intern

June 2024 - August 2024

- Responsible for the research and development of image search and text-based visual search for staples products. Fine-tuned SOTA models for image needs in Databricks on a large dataset of products. Final models were 74% accurate at matching images to relevant products.
- Created pipelines for continuous model training and deployment for image search in a Kubernetes pod. Co-developed a multimodal search platform that utilized both text-matching and image matching methods for internal use at Staples.
- Conducted time series analysis on staples delivery information and fine-tuned a transformer decoder based model for delivery next event prediction for multiple vendors (usps, fedex, etc.) to be used for consumer product delivery. Models were 95% accurate at predicting next delivery event and time.

Neuberger Berman

Chicago, IL

Machine Learning Researcher

March 2024 - Present

- Spearheaded research and development initiatives in machine learning at Neuberger Berman's Investment Portfolio Branch. Utilizing my own research methods and ideas to solve complex real-world problems using machine learning.
- Utilized LLM's and statistical models to streamline the evaluation of mortgage loan documents using a large dataset of said documents. This initiative resulted in a 15% reduction in processing time and costs, significantly improving operational efficiency and resource management.
- Designed logistic regression and LSTM models to automate and enhance quantitative risk assessment for fixed-income investment analysis and implemented mathematical methods as well. This development improved the precision of risk evaluations and increased the efficiency of the analysis process.

SAIC - IDS Labs

Chicago, IL

Software Engineer

September 2023 - May 2024

- Data analysis and full stack development of supporting software for IDS Labs.
- Developed application and corresponding microservice in Go to compare face, iris, and/or fingerprint images on-demand using cutting-edge models. On-demand comparison application led to a 55% increase in efficiency in comparing images and algorithms. Deployed in Kubernetes pod.
- Develop dockerized systems in .NET to facilitate the use of state-of-the-art skin tone devices used in data collection events consisting of 2500 subjects to allow for analysis of demographic bias in facial recognition models.

SAIC - IDS Labs

Washington DC, MD

Software Development/Data Analysis Intern

July 2023 - August 2023

- Worked on developing a Go microservice and corresponding data pipeline for transforming biometric unstructured data into a cloud-readable format and ingesting it; the service was used to transform 2 Terabytes of data from multiple vendors including Cognitec, Clear, and Idemia to be used for ongoing research.
- Conducted multivariate data analysis by evaluating vendor facial and skin tone algorithms across twin/doppelganger datasets. Quantified performance metrics such as equal error rate, false acceptance rate, and F1 score to assess model accuracy.

SKILLS

Programming: Python 3, Java 8+, .NET, BASH, Golang, R, SQL, C, C++, C#, HTML/CSS, Javascript, Haskell
Technologies: Databricks, MLFlow, Docker, Azure, Snowflake, Pytorch, Linux, Kubernetes, Postgres, Triton
Skills: Deep Learning, Reinforcement Learning, Optimization, Multivariate Analysis, Time-Series Analysis, Natural Language Processing, Signal Processing, Statistical Modeling, Generative AI
Certifications: Python-Certified Entry Level Programmer, Oracle Certified Associate Java SE 8 Programmer

PROJECTS

Reinforcement Learning Trader

Chicago, IL

Strategy

September 2023– December 2024

- Developed and backtested a trading strategy leveraging Reinforcement Learning in Python, using historical S&P 500 data from Yahoo Finance. Initial simulations achieved a 150% average profit.
- Designed and implemented a deep Q-learning agent in PyTorch, using realized profit and loss (PnL) as the reward signal. The agent optimized trading decisions through iterative policy updates, exploring long/short positions.
- Performed data preprocessing and feature engineering on S&P 500 price data since 2010, handling missing values, outlier detection, and transforming raw price data into time series features like moving averages, volatility indicators, and momentum oscillators.

C++ Options Pricing

Chicago, IL

Platform

May 2023 – August 2023

- Implemented Black-Scholes and Monte Carlo pricing models from scratch in C++ and then optimized for performance using parallel computing and low level optimizations.
- Reduced Black-Scholes runtime by 62% through efficient CDF handling and refining volatility skew adjustments. I also optimized library calls for numerical integration and differential equations.
- Enhanced the performance of a Monte Carlo model, optimizing it by 76% through the implementation of parallel independent simulations. This required a complete reworking of the random number generation process to eliminate potential correlations and ensure the accuracy of the results.

ML-GUI

West Lafayette, IN

Hackathon Project

March 2022

- Partnered with 2 peers to create a machine learning GUI application for users to upload data and then receive created Regression, SVM, and NLP models.
- Created an automatic NLP modeling software GUI that allows a user to input raw data and receive a language model that generates similar text and a language model that can predict the class of inputted text. The models were developed with PyTorch, FastAI, NumPy, and Pandas. The classifiers generated had an average accuracy of 85% and the generated text was slightly distinguishable from human text.