Changming Liu

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EDUCATION

Harvard University **Boston, MA**
Master of Data Science Expected March 2027

University of California, San Diego (UCSD) **San Diego, CA**
Bachelor of Mathematics and Computer Science; Double Major in Business Economics September 2021 – June 2025

Cumulative GPA: major GPA 4.0/4.0 (Total GPA: 3.89/4.0) with Provost Honor every semester; GRE: 335/340

Relevant Courses: Advanced Data Structures and Algorithms, Software Engineering, Distributed Systems, Web Mining, Artificial Intelligence, Computational Statistics, Recommender Systems, Data Analysis, Theory of Computability

WORK EXPERIENCE

CNPC USA **Houston, TA**
Software Engineering Intern July 2024 – October 2024

- Developed a scalable data ingestion pipeline for large geological datasets, leveraging SQLAlchemy with MySQL for efficient structured data storage and retrieval, reducing data preprocessing time by 40%.
- Developed a microservices-based real-time geological data ingestion system using FastAPI and Node.js, integrating Redis streams to process high-frequency sensor and drilling data, reducing pipeline latency by 35%.
- Designed and implemented scalable algorithms using Dask & Pandas, structuring large oil and gas datasets using Python and SQLAlchemy, reducing data preprocessing time and improving downstream ML model accuracy.

Boston Consulting Group (BCG) **Shanghai, China**
Biotechnology Consulting Intern June 2023 – August 2023

- Developed an optimized bioinformatics data pipeline for genomic analysis, improving data processing speed by 30% and enabling the handling of large-scale genomic datasets and deeper genetic variation insights.
- Analyzed over 50 policy documents and conducted 15 expert interviews to evaluate the impact of recent Chinese healthcare reforms on the biotechnology industry. Compiled findings into a strategic report that outlined key risk factors, providing insights for biotech firms to refine their market entry strategies and enhance compliance protocols.
- Collaborated with BCG's analytics team to deploy cloud-based machine learning workflows (AWS Lambda, S3) for biotech data modeling, enhancing CRISPR market simulation accuracy across 30+ datasets.

CITIC Securities **Beijing, China**
Data Engineering & API Development Intern June 2022 – August 2022

- Leveraged regression analysis and Monte Carlo simulations and employed PowerBI for extensive historical data visualization to analyze each fund's risk and return profile which led to a 20% increase in investor inquiries.
- Developed an automated financial news aggregation system using Selenium and FastAPI, implementing data cleaning and structured parsing to extract relevant market insights before storing them using MySQL database.
- Assisted in maintaining and adding features to the company's online platform using Angular, enhancing data validation and integrating real-time API communication with FastAPI and Redis caching.

RESEARCH, PROJECT & LEADERSHIP EXPERIENCE

Biological Data Analysis Research, *UCSD Ion Channel Neurotransmission Analysis Assistant* August 2024 – Present

- Developed a Python pipeline using NumPy, Pandas, and OpenCV for microscopy image integration, reducing data processing time by 10 minutes per dataset of 10,000 images, enabling reliable and efficient batch analysis.
- Utilized MATLAB functions like polyfit and findpeaks for polynomial regression and peak intensity analysis, achieving 95% accuracy in calcium intensity peak prediction and extracting precise biological metrics such as half-life
- Developed a web-based interactive dashboard using React.js and FastAPI, integrating a RESTful API with MongoDB for structured storage, improving data accessibility and reducing manual report generation time by 40%.

Full-stacked AI based Tarot card reading Web App, *UCSD Project Leader* January 2023 – June 2023

- Developed AI based Tarot card reading online platform with implementation of NLP sentiment analysis(OpenAI API) and Bayesian probability model to provide personalized and context-based interpretation based on user queue.
- Implemented real-time interactive system reporting through Socket.IO and React.js which allows multiplayer Tarot reading and card interpretation, resulting 50% user satisfaction and 25% reduction in the session dropout rate.
- Deployed full-stack architecture online using Node.js on AWS; employed Elastic Load Balancing (ELB) to distribute user traffic across multiple instances of the application and reducing downtime, improving API response time by 20%.

SKILLS & INTERESTS

Frontend: JavaScript, TypeScript, HTML, CSS, Angular, React Native, Webpack, Bootstrap, jQuery
Backend: Python (NumPy, Pandas, SciPy), R (Bioconductor, ggplot2, tidyverse), NodeJS, Java, JUnit, REST
Database: MySQL, MongoDB, SQLAlchemy, Power BI, Redis, Flyway, Data Modeling, SQLite
Machine Learning: OpenAI API, PyMC3, NLP, Bayesian Inference, TensorFlow, PyTorch, Scikit-learn, Deep Learning