

Haoyu (Marco) Liu

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EDUCATION

University of California, San Diego

San Diego, CA

Master of Science in Computer Science

Sep. 2023 – Dec. 2024

- Courses: Database Systems, Recommender Systems & Web Mining, Probabilistic Reasoning & Decision-Making

The Chinese University of Hong Kong (CUHK)

Hong Kong

Bachelor of Science in Computer Science | GPA: **3.73/4.0**

Sep. 2019 - May 2023

- First Class Honor, Outstanding Academic Performance Award in 2021/22, Dean's List in 2020/21 & 2019/20
- Courses: Software Modelling & Design, Web Application Development, Mobile App Development, Machine Learning, AI Planning for Autonomy, Computer Vision, Operation Systems, Design & Analysis of Algorithms, Computer Graphics

SKILLS

Programming Languages: Java, Python, C/C++, HTML/CSS, JavaScript/TypeScript, SQL, Perl

Tools & Frameworks: React, Node.js, Express.js, MongoDB, MySQL, Microsoft Azure, REST API, Adobe XD, Handlebars.js, Heroku, Linux, Git, Docker, Android Studio, TensorFlow, PyTorch, Anaconda, OpenCV, OpenGL

WORK EXPERIENCE

CUHK Reliable Computing Lab

Hong Kong

Summer Research Intern

May 2022 – Aug. 2022

- Developed a systematic pipeline with **PyTorch** to integrate deep learning-based time-series forecasting models within a team, established unified and standardized procedures for data preprocessing, model instantiation, and evaluation.
- Integrated and customized 10+ spatio-temporal traffic prediction models (e.g., RNN, Seq2Seq) and dataset loaders.
- Secured models' adaptability across various datasets and tasks, preserving over 95% of the original results.

Surgical Robotics and Instrumentation Lab, CUHK

Hong Kong

Summer Research Intern

June 2021 – Aug. 2021

- Improved the performance of a spatio-temporal LSTM network for cataract surgical instrument segmentation by incorporating deep learning modules (e.g., attention modules) with **PyTorch** and **TensorFlow**.
- Designed and implemented model evaluations and comparisons to demonstrate deblurring and segmentation network novelty under special scenarios.

SELECTED PROJECTS

Video Analysis Module for *Tellus* AI Assessment Platform [Product Introduction](#) / [Website](#)

Sept. 2022 – April 2023

- Designed and constructed E-R diagrams, UML class diagrams, and database schema based on use cases.
- Integrated **Microsoft Azure AI Face Service** and **Python** libraries/frameworks (e.g., **OpenCV**, **MediaPipe**, **DeepFace**) to facilitate facial, emotion, accessory, and body language analysis, boosting analysis accuracy by **30%**.
- Utilized **React**, **TypeScript**, and **Material UI** to create **real-time** camera calibration feature and visualization dashboard.
- Developed algorithms using **Python** for interviewee presentation skills auto-evaluation and cheating detection.
- Designed scoring & commenting algorithms to achieve **93%** analysis accuracy and **40%** faster runtime.
- Designed **100+ unit** and **integration** tests using **Pytest** for application testability and security, keeping 80% code coverage.
- Employed **REST APIs** for video management and implemented **CURD** operations on evaluation results using **MySQL**.

Diabetes-Home: A Diabetes Management Web Application [Website](#) / [Github](#)

March 2022 – May 2022

- Developed a web application for patient-clinician data management and deployed the website on **Heroku**.
- Designed and implemented frontend **UX/UI** using **Adobe XD**, **Handlebars**, **CSS**, and **JavaScript** with **responsive design**.
- Implemented authentication and authorization using **Passport.js** and role-based redirection upon login.
- Developed the backend using **Node.js** and **Express.js**, and managed data with **MongoDB**.
- Implemented **REST APIs** for patients and health records management, including searching and filtering.

Media Personality Popularity Visualization Platform

March 2023 – April 2023

- Developed a web application for visualizing popularity trends over the past decade, using **Netlify** and **Render** for hosting.
- Created a dynamic frontend with **React** and implemented interactive charts with **Apache ECharts**, allowing users to track and compare popularity data fluctuations of selected individuals, and filter data by media source.
- Implemented web scraping with **Axios** and **Cheerio** for data acquisition from multiple sources.
- Scheduled periodic data scraping (once a month) and automated **MongoDB** database updates with **Cron**.