Haosong Liu

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Los Angeles
My Website: haosongliu.com
Machine Learning Engineer / Software Engineer

EDUCATION

University of Southern California   Jan 2022 - May 2024
Electrical Engineering Master   Los Angeles
- Related coursework: *LLM, Document Embedding, Prompt Engineering, Convex Optimization, Advanced Deep Learning Systems, Cloud Computing and Distributed Systems, Hardware IoT, Remote Direct Memory Access.*

University of California, Irvine.   Sep 2016 - Jun 2020
Computer Science Undergraduate.
- Minor: Data Science
- Related coursework: *Software Engineering theory, Algorithms and Data structures, Database principles and applications, machine learning and data mining, statistical probability*

Certification

AWS Certified Machine Learning – Specialty   Dec 2023
Issued by Amazon Web Services Training and Certification

Professional Skill

- **Computer Languages:** C/C++ , Python , Java , JavaScript , HTML , MySQL , Git , Bash
- **Environments & Libraries:** PyTorch, Keras, Linux OS, AWS Sagemaker, AWS EC2, GitHub, Docker, Microsoft Visual Studio Code, Postman API.
- **Professional:** Code optimization, technical documentation, communication & presentation, team organization and leadership, project management, development workflow optimization, collaboration, mentoring.

WORKING EXPERIENCE

Qianxun Spatial Intelligence Inc.   Feb 2021 - Aug 2021
Machine Learning Engineer Internship   Shanghai
- Developed and tailored a web-based offline tool using JavaScript for the annotation of continuous street view imagery, enabling accurate labeling of lane markings, lane arrows, and drain outlets.
- Collaborated in the training of a building/structure segmentation model using point cloud data from satellite oblique photography, advancing 3D city reconstruction efforts.
- PypptRoadSign Library Project (*https://pypi.org/project/PypptRoadSign*):
  - Lead and directed the development of a Python library using the Microsoft PowerPoint Python interface to facilitate the automated construction of SVG road signs.
  - Integrated the library into team workflows, allowing team members to seamlessly convert spatial data obtained from a text and entity detection network into SVG road sign representations.

California Plug Load Research Center   Mar 2019 - Jun 2020
Front-end Developer & Research Assistant, CalPlug Simhome Team   Irvine
- Worked as part of the Calplug Simhome Team to develop a system monitoring energy usages of household appliances inside a simulated home area, improving energy efficiency by 20 percent.
- Lead the implementation of Amazon Alexa integration with the monitoring system, leveraging services provided by Amazon AWS (LambdaFunction, AlexaSDK) to develop, test, and collect data for the VUI and GUI.

UCI School of Information and Computer Science Laboratory Mentor Project   Dec 2017 - Mar 2019
Laboratory tutor   Irvine
- Coached approximately thirty to fifty freshman and sophomore students in experiment-based courses each semester, assisting in teaching foundational programming and offering guidance in laboratory assignments.
- Assisted professors in syllabus construction and conceptualization, the development of supplementary learning materials, and the construction of course websites.

PROJECT EXPERIENCE

E-TA (USC Directed Research)   Jan 2024 - Present
Directed Researcher   https://e-ta-frontend.vercel.app/dashboard
- Developed an chatbot using OpenAI's GPT-3.5 Turbo to answer course material and logistic questions, enhancing student engagement and support.
- Utilized llama-index library for creating document embeddings of Piazza Q&A and video lecture transcripts, enabling efficient information retrieval.
- Integrated with a third-party Piazza API to automate responses to new questions posted on Piazza, with an hourly update mechanism for embedding new Q&A pairs.
- Built an interactive chatbot web app for easy access to course-related inquiries, significantly improving the educational experience by offering real-time assistance. Web app hosted on www.e-ta.net

SmartCourt IoT Project   Aug 2023 - Dec 2023
Course Project Leader
- Engineered a court availability system using Raspberry Pi with TensorFlow Lite for real-time human detection, facilitating efficient use of public tennis and pickleball courts.
- Orchestrated data transfer via LoRa gateway to Amazon S3 buckets using AWS Kinesis, storing court occupancy metadata.
- Developed a web application displaying live court status, significantly reducing search times for players.

MICCAI2020RibFrac competition   Jun 2020 - Sep 2020
Research Assistant   https://ribfrac.grand-challenge.org/
- Cooperated with teammates and trained an AI model able to conduct automatic and highly accurate rib fracture detection and classification
- Used 2D/3D U-Net CNN architecture to establish the deep learning model and trained the model using over 400 training CTs provided by organizers
- The final submitted model has an evaluation score of 0.74 (Detection FROC Score) and is currently listed as the 27th best performing model among all 100+ submitted models.