Zhuoheng Li

+1 916-490-1633 | andy.zhuohengli@gmail.com | linkedin.com/andy-zhli | andy-lzh.github.io | Davis, CA 95616

Research Interests

Computer Vision, Semi-Supervised Learning, Multimodal Learning

Education

University Of California, Davis — Davis, CA
B.S in Computer Science; GPA: 3.56/4.00 — *Sep 2020 - June 2024*

Professioinal Experience

RoastPic Inc. — June 2023 - Sep 2023
Software Engineer Intern; Founding Member — *Remote*

- Responsible for design and implementatoin of RoastPic backend system and MLOps pipelines.

UC Davis Coffee Center — Oct 2021 - Present
Research Assistant; Advised by Prof.William Ristenpart — *Davis, CA*

- Launched RoastPic, a mobile coffee analytic app that accelerated the digital transformation of the coffee supply chain, resulting in the successful establishment of RoastPic Inc. after securing **$250K** in seed funding.
- Constructed mobile app experience for User Auth Screen, Home Screen, Image Upload/Analysis Screen, History Screen, and Analytic result Screen using React Native and its ecosystem based on Figma prototypes.
- Developed efficient synchronization mechanisms including sync-compatible schemas, access rules, and Flexible Sync React Native Wrapper to ensure real-time data updates between the mobile app(Realm) and MongoDB Atlas.
- Utilized Amazon S3 as a cost-effective solution to store images for future accessibility and CDN integration.

RUbiNet Lab — Aug 2022 - Feb 2023
Research Assistant; Advised by Prof.Chen-Nee Chuah — *Davis, CA*

- Conducted research on improving the performance of **multimodal** model in medical image classification under **semi-supervised learning** setting.
- Pre-Processed PCam dataset contains **326K** Lymph node scans using Python, Pandas, and PyTorch.
- Implemented a Residual Feature Connection(RFC) layer on CLIP in optimizing learnable vectors extracted from image encoder, outperforming accuracy of Zero-Shot CLIP by **26.26%** with only **10%** of labeled data.
- Visualized high-dimensional feature embedding using Matplotlib and T-SNE algorithm in scikit-learn, providing a more intuitive way to evaluate model performance.

Collimate — Mar 2021 - Jan 2022
Software Engineer — *Davis, CA*

- Worked in an engineering team of 11, responsible for UI and functionality development of a college real-time chat application using agile process; achieved **700+ MAU** after first release.
- Developed a Homepage UI on Android and iOS devices, including side navigation menu, Class chat screen, and unread messages count, using React Native as the framework, and Realm as the local Database.
- Conducted unit, integration, and **end-to-end tests** on various devices to ensure UI functionality.

Publications and Technical Report

- Z. Lai, J. Chauhan, **Z. Li**, L. Cerny Oliveira, C-N. Chuah, "Path-CLIP: Efficient Adaptation of CLIP for Pathology Image Analysis with Limited Data", under review by IEEE Transactions on Pattern Analysis and Machine Intelligence.
- M. Suresh, **Z. Li**, "DeepCoffee : Coffee Flavors Prediction Using Deep Learning", Technical Report for ECS 289G Advanced Deep Learning

Teaching Interest

ECS 197T - Tutoring in CS — Jan 2023 - Mar 2023

- Worked in an tutoring team of 13, responsible for tutoring lower-division Object-Oriented Programming class(ECS 36A, ECS 36B) and high-division Deep Learning class (ECS 189G) in a 3-hour weekly session.

ECS 289G - Advanced Deep Learning — June 2022 - June 2022

- Conducted a comprehensive presentation on SOTA in generative models titled "GIRAFFE: Representing Scenes as Compositional Generative Neural Feature Fields" to a graduate-level class.

Projects

Auto-Adapter | *Python, PyTorch* June 2023 - Present

- Identified a significant performance bottleneck in the language encoder component during the analysis of a multi-modal model zero-shot task, while the vision encoder demonstrated robust performance.
- Conducted an extensive literature review on recent advancements in domain adaptation techniques of vision-language models, focusing on methodologies and models designed to address the challenges of transferring knowledge across vision and language domains.
- Performed baseline experiments on state-of-the-art domain adaptation methods to gain insights into the problem and establish a performance reference for the newly developed approach.

DeepCoffee | *Python, TypeScript, OpenAI, React.js, Material UI* April 2022 - June 2022

- Built a DeepCoffee Model with an accuracy of **83.2%** in coffee flavor prediction task using GPT-3 text-davinci-002 Engine fine-tuned with limited coffee flavor data of only **1300** entries.
- Documented the development process, including data preprocessing steps, model architecture, training parameters, and evaluation metrics.
- Customized Material UI's **autocomplete component** to enable enhanced auto complete function via OpenAI API and DeepCoffee model, using user input as prompt and model-predicted information as autocomplete results, thereby improving user experience.

AI Tonight | *Python, PyTorch, Hugging Face* May 2021 - May 2021

- Developed a web application using React and D3 to visualize UC Davis' annual budget expenditure across various categories.
- Employed responsive design principles to ensure optimal viewing experience across devices via React and media query.
- Stored the user input values in cookies, enabling the application to retrieve and utilize the data for generating the budget expenditure diagram.

Fitness Tracker | *JavaScript, HTML/CSS, Express, REST API, Passport.js, GCP, SQLite3* Mar 2021

- Designed and developed a comprehensive fitness tracking web application using Express.js for the back-end and HTML5, CSS, and JavaScript for the front-end.
- Implemented RESTful API endpoints in Express.js to handle user authentication, data storage, and retrieval for fitness-related activities.
- Constructed SQLite3 Database to store fitness records for consistency and future accessibility.
- Implemented CRUD (Create, Read, Update, Delete) operations using SQL queries to enable seamless data manipulation and retrieval.

Technical Skills

Languages: Python, TypeScript/JavaScript, C/C++, Java, HTML/CSS, SQL, Bash, regex
Technology: React.js, React Native, D3.js, GraphQL, Django, AWS(EC2, EKS, S3), Docker, K8s, PyTorch, Pandas
Database: SQLite, PostgreSQL, MongoDB, Firebase, Realm, Redis