

Zixuan (Vicky) Zheng

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Education

School of Computer Science at Carnegie Mellon University

Pittsburgh, PA

Bachelor of Science in Computer Science and Statistics & Machine Learning (Cumulative GPA: **3.84**) Expected December 2024

Relevant Coursework: Parallel and Sequential Data Structures and Algo, Machine Learning, Computer Systems, Software Construction, Imperative Computation, Functional Programming, Great Ideas in Theoretical CS

Project Experience

BlogHub

May 2023 – June 2023

- Developed and deployed a well-functional single page application using **React (TypeScript)** from scratch for blog posting and an admin site using **Ant Design** with integrated Markdown editor to manage blogs and category tags;
- Designed a well-structured database schema utilizing Python-based ORM library **SQLAlchemy** to ensure efficient data storage and management
- Implemented the backend functionality using **FastAPI** framework to enable smooth data retrieval, manipulation, and secure authentication; utilized **Axios** for seamless communication with the backend API

COMPASS (Context Marking and starter Phrases for Synchronized Socializing)

Feb 2023 – May 2023

- Collaborated in the implementation of a web-based interface designed to facilitate real-time online communication for users with speech-generating disabilities
- Performed text cleaning and stop words removal on 3940 dialogue scripts from switchboard dialogue act corpus using **Python**
- Refined keyword extraction model **KeyBERT** and evaluated its performance on the switchboard dataset using cosine word embedding similarity; achieved 78% average accuracy in extracting conversation topics
- Developed visualization pipelines in **R** for analyzing user satisfaction, interface usability, and feature effectiveness based on the results of the user study on 6 pairs

Online Interactive Latin Motto APP

Jan 2019 – Aug 2021

- Web-crawled 572 + school mottos and Latin-word dictionaries using **Python** and stored data in **MySQL**
- Built a mobile application with **Django** as the backend to support data categorization and transmission; manually edited English and Chinese translations and composed grammar references on the Django admin site
- Designed and implemented UI that supports Motto Search, Latin English/Mandarin Dictionary, Favorites, and Grammar using **Vue** to elevate Latin's accessibility for beginners and promoted interactive Latin learning
- Used by 400+ local high school students; launched on Google Play and received Authorship of Software Issued by the National Patent Bureau

Research Experience

Robotics Institute at CMU | Research Assistant, Summer Undergraduate Research Apprenticeship

May 2023 – Present

- Engineer a novel approach to incorporate physics constraints with computer vision algorithm **NeRF** (Neural Radiance Fields) to accurately predict the state of cloth-like objects under manipulation in biomedical applications
- Design and implement script using Blender **Python** API to automatically generate 120+ simulation scenes in Blender for algorithm evaluation; incorporated randomized cloth size, texture, falling heights, and ground objects
- Constructed a robust pipeline that combines Real-Time High-Resolution Background Matting model with **COLMAP** framework to generate synthetic image dataset with subtracted background and JSON file of camera Field of Views (FOV) and relative poses
- Leverage **AprilTag** to recover objects' world frame translation and scale to improve robots' perception capabilities

Guangzhou Intelligence Electrical Technology Company, Ltd. | Research Assistant

June 2019 – March 2021

- Used **LabelImg** to manually label and classify 1271 sample bird nest images taken by drones as training and testing dataset
- Augmented data through mirroring, rotation, Gaussian blur, pixel removal using **PyTorch**, resized images, and labeled regions
- Evaluated model's performance using Mean Average Precision (MAP), successfully raising 10+% accuracy rate and boosting 80 % processing efficiency
- Published 10+ pages report in IEEE Access Journal (Volume: 7); granted National Patent for Technological Invention

Skills

- Programming Languages & Technology: Java, Python, C, TypeScript, R, HTML/CSS, React, Vue, Django, TensorFlow, PyTorch, FastAPI, Blender
- Language: English (Fluent), Mandarin (Fluent), Cantonese (Fluent), Latin (Intermediate), Japanese (Elementary)
- Honor: National Level Golf Athlete, Overall Winner of the 2019 Oakland City Junior Championship, California

Other Involvement

iD Tech | Camp instructor for UCLA Academy: Machine Learning & Artificial Intelligence

June 2023 – Present

Break Through Tech AI Program at Cornell Tech | Fellow

May 2023 – Present

SWE++ Coding Camp | Teaching Assistant

Feb 2022 – April 2022