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 Expected Dec. 2024
Cumulative GPA: **3.84/4.00**
Relevant Coursework: Data Structures and Algo, Modern Regression, Autonomous Agents, Computer Security, Machine Learning, Computer Systems, Software Construction, Imperative Computation, Functional Programming, Great Ideas in Theoretical CS

Skills

- **Programming Languages & Technology:** Python, Java, C, TypeScript, R, HTML, CSS, React, Vue, Django, TensorFlow, PyTorch, FastAPI, Blender
- **Honor:** Dean's List, National Level Golf Athlete, Overall Winner of the 2019 Oakland City Junior Championship, California

Project Experience

Portfolio Nexus: Web Portfolio and Administration Hub May 2023 – Jun. 2023
- Developed and deployed a well-functional single-page web portfolio application using **React (TypeScript)** and an admin site using **Ant Design** with an integrated **Markdown** editor to manage dynamic web page data
- Incorporated responsive design, **CSS** animation, dynamic theme, and a rolling bullet curtain feature for skills in portfolio page
- Designed database schema using the Python-based ORM library **SQLAlchemy** to ensure efficient data storage and management
- Implemented the backend functionality using the **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
- Launched on Google Play and received Authorship of Software Issued by the National Patent Bureau; Used by 400+ students

Research Experience

Robotics Institute at CMU | *Research Assistant, Summer Undergraduate Research Apprenticeship* May 2023 – Present
- Engineer a novel approach to incorporate physics constraints with the 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
- Built a robust pipeline that uses the Real-Time High-Resolution Background Matting model with the **COLMAP** framework to generate a 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* Jun. 2019 – Mar. 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

Extracurricular Involvements

17214/17514: Principles of Software Construction | *Teaching Assistant* Incoming
iD Tech | *Camp instructor for UCLA Academy: Machine Learning & Artificial Intelligence* Jun. 2023 – Present
Break Through Tech AI Program at Cornell Tech | *Fellow* May 2023 – Present
Student Academic Success Center at CMU | *Fellow* Aug. 2022 – Present
SWE++ Coding Camp | *Teaching Assistant* Feb. 2022 – Apr. 2022