

Zixuan (Vicky) Zheng

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Portfolio: <https://zixuanzheng.com/> | LinkedIn: <http://www.linkedin.com/in/zzheng3> | GitHub: <https://github.com/Zionified>

Education

School of Computer Science at Carnegie Mellon University

Pittsburgh, PA

Bachelor of Science, Double Majors: Computer Science, Statistics

Expected Dec 2024

Cumulative GPA: **3.80/4.00**

Honor: Dean's List, National Level Golf Athlete, Overall Winner of the 2019 Oakland City Junior Championship, California

Relevant Courses: Database, Data Structures & Algorithm, Deep Learning System, Machine Learning, Software System, Security

Skills

- **Programming & ML Tools:** Java, Python, C++, TypeScript, C, R, SQL, Assembly, PyTorch, Tensorflow, Jetson-Inference
- **Software / Full-Stack Web Development:** HTML, CSS, React, Vue, MySQL, Django, Docker, FastAPI

Work Experience

Amazon Web Services | Software Development Engineer Intern

Jun 2024 – Aug 2024

- Engineered and integrated a governance control feature to the production pipeline in the Amazon Q Apps dashboard using TypeScript, empowering Amazon Q Business Pro admins to effectively manage and verify application statuses
- Developed and integrated frontend features and new API to support the display of verification icons within the web experience; conducted unit tests and validated backend API calls using **Bruno**
- Performed prompt engineering and benchmarking on Haiku and Titan models for Amazon Q Apps generation against existing Sonnet model to identify optimal performance improvements in terms of cost, speed and accuracy

iD Tech | Camp Instructor of AI and Machine Learning Academy with NVIDIA

Jun 2023 – Aug 2023

- Developed a **PyTorch** batch script to train student's data on CNN-based algorithms (VGG, ResNet, DenseNet, MobileNet)
- Implemented a prediction snippet on students' Nvidia Jetson-Nano server using **HTTP-based RPC** to report real-time results to a web-based console for student
- Mentored 20+ high school students on projects like web page gesture navigation, real-time language translation, and etc.

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

May 2023 – Aug 2023

- Led a 5-member team to engineer a novel approach in incorporating physics constraints with **NeRF** (Neural Radiance Fields) to accurately predict the state of cloth-like objects under manipulation in biomedical applications
- Designed and implemented scripts using Blender **Python** API to generate 120+ simulated scenes in Blender for algorithm evaluation automatically in less than 1 minute, leveraging randomized cloth size, texture, falling heights, and ground objects
- Built a robust automation pipeline that integrates the Real-Time High-Resolution Background Matting model, the **COLMAP** framework, and **AprilTag** to generate a synthetic image dataset with subtracted background and JSON file of camera field of views (FOV) and relative poses; improved robots' perception capabilities

Project Experience

BusTub Database System

Jan 2024 – May 2024

- Developed core components for the BusTub DBMS in **C++**, enhancing storage management, indexing, query execution, and transaction concurrency
- Engineered and integrated a disk-oriented storage manager with thread-safe buffer pool manager & LRU-K replacement policy
- Implemented an extendible hash table, supporting efficient, thread-safe search, insertion, deletion, and dynamic directory resizing for optimized performance
- Supported SQL query execution components and implemented optimistic multi-version concurrency control (MVCC), including advanced features like HashJoin, Window Functions, Top-N optimization, and snapshot isolation for transactions

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
- Leveraged responsive design, **CSS** animation, dynamic theme, and a rolling bullet curtain feature to optimize portfolio page
- Designed database schema using 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, and utilized **Axios** for seamless communication with the backend API

Online Interactive Latin Motto APP

Dec 2021 – Mar 2022

- Self-learned and built a mobile application used by 400+ students with **Django** as the backend to elevate Latin's accessibility for beginners and promoted interactive Latin learning
- Web-scraped 572+ school mottos worldwide and Latin-word dictionaries using **Python** and stored data in **MySQL**
- Designed and implemented UI that supports Motto Search, Latin English/Mandarin Dictionary, Favorites, and Grammar using **Vue**; polished English and Chinese translations and composed grammar references on the Django admin site
- Launched on Huawei App Gallery and received Authorship of Software issued by the National Patent Bureau