

ZEEL SHAH

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EDUCATION

Arizona State University

Tempe, AZ

Bachelor's in Computer Science, Minor in Statistics (GPA: 4.0)

Jan 2023 - May 2026

Relevant Courses: Principles of Programming, Object-Oriented Programming and Data Structures, Introduction to Programming Languages, Digital Design Fundamentals, Calculus 1, Calculus 2, Calculus 3, Introductory Applied Statistics

Honors and Awards: ASU NaMU Scholarship (\$58,000), ASU GHC Scholarship, Dean's List Spring 2023

EXPERIENCE

XuLab, Carnegie Mellon University | Research Assistant

June 2023 - Present

Mentor: Ali Dabouei and Prof. Min Xu

- Researched **video anomaly detection** for a robot in an automated lab setting with a small dataset and class imbalance problem by developing a practical feature extraction method for liquid transfer video images using **PyTorch**.
- Incorporated an external unlabeled dataset by generating pseudo-labels optimized hyperparameters and feature extraction to enhance model generalizability and outperform state-of-the-art methods by 19%

Active Perception Group, Arizona State University | Research Assistant

April 2023 - June 2023

Mentor: Prof. Yezhou Yang

- Researched cross-modality techniques for **text-to-music generation** by implementing Variational auto-encoder (VAE) architecture and data augmentation techniques to lyrical-midi corpora using **PyTorch** framework and **Fairseq** toolkit.
- Achieved music generation when conditioned with text by training an autoencoder skeleton initialized with frozen **BERT** and **SymphonyNet** weights, and a learnable latent space, resulting in a range of musical compositions with loss of 1.524.

ARGOS Vision, Arizona State University | Full Stack Development Assistant

Feb 2023 - April 2023

- Developed a web application to display real-time surveillance camera footage while detecting and plotting points for people and cars by designing the frontend and backend architecture and integrating the ML algorithm.
- Developed the backend using **Django**, integrated **Postgres** for efficient database management, applied **React.js** and **Tailwind CSS** to create a responsive frontend, and utilized developer tools like **Postman** and **Swagger** for API testing.

PROJECTS

WasteNot: an expiry date tracker | <https://devpost.com/software/wastenot-hpx648>

MongoDB, Express, React, Python

- Led development of a MERN sustainable expiry date tracker web app that uses **Computer Vision, NLP, and OCR** and implements features such as fresh produce detection, barcode scanning, receipt scanning, and expiry reminders.
- Integrated multiple technologies and APIs including **PyTorch, Keras, TensorFlow, OpenCV, Langchain, OCR Asprise API, Open Food Fact API**, and to provide accurate information on estimated expiry dates and carbon footprint.

FundRiser: a web3 crowd-funding solution | <https://devpost.com/software/fundriser>

React, Express, Hedera, Circle, Azure

- Created a web3 crowdfunding platform that leverages blockchain technology (**Hedera network**) for secure and transparent fundraising and utilized **React, Express.js, and Tailwind CSS** to create a modern design.
- Integrated **Microsoft Azure** for user authentication and **Circle** for processing anonymous card and cryptocurrency donations, winning the **Best Use of Microsoft Cloud** and **Best Use of Circle** at the Web3Apps Hackathon.

BookMaster: a personal bookshelf | <https://github.com/shah-zeel/book-master>

MongoDB, Express, React, CSS

- Built a full-stack web application for book management, utilizing **React** for the front-end and **Express.js** and **MongoDB** for back-end CRUD operations, and enhancing the UI with **Bootstrap** and custom **CSS** styling.
- Implemented core features including book listing, creation, editing, and deletion, with seamless communication via API requests, and creating a scalable foundation for potential **K-Nearest Neighbors (KNN)** recommendation integration.

Alphabet to Brain Signals: an LSTM Model for Neural Activity Generation

PyTorch, Pandas, Matplotlib

- Led a project addressing the limited dataset challenge in BCI research, employing LSTM models to synthesize neural activity data for single letters. Experimented with data augmentation and model architectures, to improve convergence and feature learning and achieved a **0.003 MSE loss** after 100 epochs, to advance assistive and BCI technologies.

LEADERSHIP

Engineering Projects in Community Service (EPICS) - Software Development Lead: Designed a Python curriculum to teach robotics and programming and foster practical engineering skills for 50-100 marginalized students in South Africa.

Google Developer Student Club - Technical Officer: Led Web Development and Machine Learning workshops equipping 150-200 participants with the latest industry techniques and best practices and empowering them with practical skills.

SKILLS

Languages and Databases: Python, C, C++, Java, JavaScript, SQL, PostgreSQL, MySQL, MongoDB, Firebase

Web Development: HTML, CSS, Node.js, React.js, Next.js, Angular, Express.js, Django, Flask, Bootstrap, Tailwind CSS

ML & Data Analysis: PyTorch, Keras, TensorFlow, Pandas, NumPy, Matplotlib, OpenCV, Scikit-learn, Fairseq, Seaborn

Developer Tools: Git, Eclipse, Postman, Swagger, Google Cloud, Microsoft Azure, Docker, Linux, VSCode, REST APIs