Pranav Banwasi

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Education

University of California, Berkeley Berkeley, CA

BS in Electrical Engineering and Computer Science — GPA: 3.8 *Expected Graduation: May 2026*

- Relevant Coursework: Operating Systems, Database Systems, Optimization Models, Data Structures and Algorithms, Computer Architecture, Full-Stack Web Development, Linear Algebra, Multivariable Calculus, Probability, Discrete Math, Artificial Intelligence, Machine Learning

Experience

Undergraduate Researcher Sep 2024 - Present

Berkeley Artificial Intelligence Research (BAIR) *Berkeley, CA*

- Using PyTorch for Deep Learning Speech Synthesis models focused on the intersection of neuroscience and speech processing AI for assistive technologies. Model is trained on all physical aspects of human speech and should mimic that system through signals or recreation with an original mimicked voice.

Undergraduate Researcher Sep 2024 - Present

Berkeley Architecture Research *Berkeley, CA*

- Developing CI Infrastructure for FireSim and Chipyard for SSH server simulation.
- FireSim simulates large-scale data centers at very low cost and high accuracy through FPGA-based simulation hosted on Amazon EC2 F1 instances while emulating real hardware to the exact clock cycle. Chipyard is an integrated framework for developing specialized SoCs supporting RISC-V cores, accelerators, and FireSim.

Software Engineering Intern June 2024 - August 2024

UnitedHealth Group - Optum *Eden Prairie, MN*

- Developed a FHIR converter API in Python to transform clinical PDF questionnaires into structured hierarchical FHIR-formatted JSON for downstream usage, integrating into a Boomi workflow with Azure's Document Intelligence for extraction and GPT-4o for data organization and translation.
- The API used an algorithm I designed utilizing vector strategies and asynchronous calls to optimize memory and runtime performance, leveraging Fast API, resulting in annual savings of over $10 million for the company.
- Developed an automated QA tool that fills out online forms using Playwright and Selenium, incorporating GPT-4o for generating input data, and verifying both frontend functionality and accurate backend reception.

Projects

Random World Generator | *Java*

- Developed a pseudo-random world generation algorithm that builds a connected room-hallway map based on seeds that can be navigated by a user's avatar and can be regenerated through saving and loading
- Program has encounter features that deploy a user into another world/frame for a particular purpose, timing for game use, and a NPC that chases the user following a path generated via BFS

Pacman AI | *Python, PyTorch*

- Developed a Pacman AI using the A* algorithm on the following heurisitcs: Euclidean distance, Manhattan distance, food locations, and corners for the primary objective of calcuating paths
- These distance heuristics were calculated using BFS and an agent that searches for the shortest and safest possible path, then sending it back to the AI to follow

Noteworthy A Cappella Website | *React, Figma, MongoDB, Node.js, Express.js*

- Developed a dynamic website for Noteworthy, an A Cappella group at UC Berkeley that has over 5 million views on various social platforms. A primary feature includes view and click tracking piped to a database cluster on MongoDB for engagement data.
- Website features a video carousel utilizing the React Slick library and member cards with popup overlays displaying member bios, roles, and information. The design was inspired by a modern take on Noteworthy's color themes

Technical Skills

Languages: Python, Java, JavaScript, C, SQL x86, RISC-V
Developer Tools: Playwright, Selenium, OpenAI API, YOLO, Langchain, Tenacity, GDB, Nest.js, Node.js, Express.js, NoSQL, XCode, SwiftUI, PyTorch