Ben Xia

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Education

University of California San Diego Sept. 2024 – June 2025
Master of Science in Computer Science *[GPA: 4.00/4.00]*

University of California San Diego Sept. 2021 – June 2024
Bachelor of Science in Computer Science *Honors: Summa Cum Laude [GPA: 3.98/4.00]*
Courses: AI/Machine Learning, Deep Learning, Recommender Systems, Natural Language Processing, Operating Systems, Computer Security, Systems Programming, Data Structures, Algorithms, Digital Systems, Computer Architecture, Computer Graphics, Parallel Computing

Technical Skills

Languages: C, C++, Java, C#, Go, Python, x86/ARM Assembly, SQL, HTML, CSS, JavaScript/TypeScript, GLSL
Libraries/Frameworks: React, Node.js, NumPy, PyTorch, OpenCV, scikit-learn, OpenGL, Message Passing Interface (MPI), CUDA, OpenCL
Developer Tools: Git, Perforce, Jira, Confluence, GitHub Actions, Jenkins, Docker, Vim, Postman, Miro

Experience

Amazon, Software Development Engineer Intern Sept. 2024 – Dec. 2024

Niantic, Computer Vision Engineer Intern June 2024 – Sept. 2024
- Increased live preview performance by **150%** (frames per second) on Android devices, significantly enhancing app responsiveness and user experience by reducing micro-stutters and optimizing GPU kernels.
- Optimized real-time **Gaussian splat** training and rendering by implementing multithreading and switching to raster-based splat rendering, simultaneously improving overall performance and scene reconstruction quality by enabling greater frame processing.
- Partnered with UX designers to develop an intuitive **augmented reality** 3D space scanning preview by writing custom shaders and points of interest detectors, allowing users to easily identify under-reconstructed areas in real-time during scans.
- Implemented **real-time occlusion** support in Niantic 8th Wall's internal AR engine, elevating immersion in AR experiences.

Viasat, Software Engineer Intern June 2023 – Sept. 2023
- Overhauled satellite modem UI with **TypeScript React** to automate key swaps and reduce human intervention by **95%**.
- Enhanced modem/network security by updating interfaces and **Docker** containers to utilize new SSL certificates from key swap tool.
- Resolved race conditions for **real-time embedded systems** in C, preventing over **$5000** in potential aircraft antenna unit damages by redesigning state machines and restricting IPC messages between **operating system daemons** based on log analysis.
- Introduced **Jest** as the new standard unit-testing framework and automated **50+** unit and end-to-end tests, increasing test-coverage from **0%** to **90%** by simulating user flow and backend responses.
- Seamlessly integrated multiple testing frameworks from **Go** and **JavaScript** into a single **CI/CD** pipeline via **Jenkins**.

UC San Diego CSE Department, Undergraduate Tutor Sept. 2022 – June 2024
- Guided **1500+** students in mastering Python, C, and ARM Assembly programming, and tools such as Git, and Bash.
- Instructed **advanced algorithms**, **operating systems**, classical artificial intelligence, **machine learning** theory and implementation with optimization mathematics, scikit-learn, and **PyTorch**.
- Identified and patched **security vulnerabilities** for programming assignment autograders on Gradescope, completely eliminating most student autograder exploits.
- Hosted office hours and led discussion sections to assist students with programming assignments/conceptual problems and achieved **100%** student approval ratings across multiple courses.

Projects

Four Seasons | C++, OpenGL, GLSL
- Four Seasons is a real-time, character-based, multiplayer 3D capture-the-flag shooter game, heavily inspired by classical music.
- Designed and implemented a **custom graphics engine**, with support for textures, 3D animations, shadow mapping, non-photorealistic rendering, dynamic lighting/environments, and particles via instanced rendering.
- Supported cross-platform development by developing custom operating system and architecture agnostic networking and graphics libraries, with cross-compatibility between macOS and Windows machines.

Steam Recommender System | Pandas, NumPy, Scikit-Learn
- Designed a collborative-filtering based **recommender system** to predict which games Steam users are likely to play.
- Optimized models by **hyperparameter tuning** with grid search, cross-validation, and ensembling predictions.
- Utilized **natural language processing** techniques such as topic modeling to mitigate the cold-start problem.
- Ranked among the **top 0.3%** participants in machine learning competition in both regression and classification tasks.