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, Natural Language Processing/Large Language Models, 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
- Refined the design and added support for time-sensitive notifications for an app with **200 million+** users and **10000+** transactions per second, enabling critical alerts to bypass Do Not Disturb settings with **AWS SNS, Java** and **Swift**.
- **Eliminated** manual developer intervention by building a self-service system with **React, Redux**, **AWS DynamoDB** and **ECS**, enabling marketing teams and automatic services to directly attach images to push notifications.
- Design and delivered a notification summarization feature by leveraging **AWS Bedrock Large Language Models** to reduce user fatigue.
- Integrated safeguards for customer-facing services/LLM endpoints by enforcing **cryptographic signatures** against request forgery, **rate-limiting** requests, and Bedrock guardrails against adversarial user inputs.

Niantic, Computer Vision Engineer Intern June 2024 – Sept. 2024
- Increased live preview performance by **200+%** (frames per second) on Android devices, significantly enhancing app responsiveness and user experience by reducing micro-stutters and **optimizing OpenCL GPU kernels**.
- Boosted **Gaussian splat** reconstruction quality by multithreading training/rendering routines and switching to raster-based splat rendering with C++ and OpenGL, **increasing frames processed by 100%**, while simultaneously improving overall performance.
- Partnered with UX designers to develop an intuitive **augmented reality** 3D space scanning preview by writing custom GLSL 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
- Reduced human intervention by **95%** for key swaps by overhauling modem UI with **TypeScript React** to automate manual commands.
- 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.
- Boosted code coverage from **0% to 90%** by introducing **Jest** as the unit-testing framework, automating **50+** unit and end-to-end tests to mock 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
- Instructed **1500+** students in **advanced algorithms**, **operating systems**, classical artificial intelligence, **machine learning** theory/implementation, scikit-learn, and **PyTorch**.
- Identified/patched **security vulnerabilities** for programming assignment autograders, eliminating most student autograder exploits.
- Achieved **100% student approval** across multiple courses by hosting office hours, and leading discussion sections to assist students with Python, C, ARM Assembly, and conceptual problems.

California Coast Credit Union, Data Analytics Intern June 2022 – August 2022
- Developed and deployed an executive dashboard for viewing company-wide metrics related to call volume, call types, number of active users, number of transactions, etc.
- Wrote automated **SQL** scripts/queries for fetching/compiling data across multiple databases for dashboard.

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 and gameplay by building custom operating system and architecture agnostic networking and graphics libraries.

Steam Recommender | Pandas, NumPy, Scikit-Learn
- 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.