Alexander Li

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Education

University of Wisconsin - Madison — Madison, WI

Bachelor of Science in Computer Science & History — *September 2023 - May 2027*

- Relevant Coursework: Algorithms, Data Structures, Linear Algebra, Computer Architecture, User Interface, Computer Systems

Experience

Software Engineer Co-op — June 2025 – Present

MKS Instruments — *Rochester, NY*

- Built and deployed a full-stack hardware defect tracking system using React, .NET, PostgreSQL, and Docker, replacing Excel-based workflows across company sites.
- Designed and implemented scalable backend APIs with secure JWT authentication and AD integration for centralized access control.
- Dockerized the entire application for seamless cross-environment deployment, improving onboarding time and reducing dev-ops friction.
- Streamlined defect tracking workflows by replacing large, lag-prone Excel spreadsheets with a dynamic web form, reducing manual entry and load times by an estimated 60%.
- Refactored backend architecture to improve code modularity, maintainability, and support future machine learning integrations.

Software Engineer Intern — June 2024 - August 2024

Wisconsin Athletics — *Madison, WI*

- Redesigned and optimized pages for *UWBadgers.com* using jQuery and Bootstrap, reducing load times by 25% for over 100k monthly users.
- Developed and deployed secure REST APIs using .NET for scalable communication with frontend and third-party services.
- Participated in Agile development lifecycle, including code reviews, sprint planning, and documentation writing in a collaborative team setting.

Projects

AI Finance Platform | *Node.js, React, MongoDB, Gemini AI, Stripe*

- Built a full-stack SaaS finance app with MERN stack, offering users real-time budget tracking and receipt-based financial summaries.
- Used JWT authentication and bcrypt hashing to protect user sessions and credentials, enhancing app security.
- Integrated Gemini AI for intelligent receipt parsing and spending insights using MongoDB aggregations.
- Visualized income and expense trends with D3-powered charts and Stripe integration for monetization.

SQLite Clone | *C*

- Developed a lightweight relational database in C, emulating SQLite's architecture with a custom B-tree storage engine.
- Implemented SQL operations like `INSERT`/`SELECT`, cursor traversal, and node splitting with root promotion.
- Used low-level POSIX I/O with custom pager system for persistent storage and 4KB page-based memory management.
- Built internal tools (`.btree`, `.constants`) for visual debugging of internal memory structures.

Technical Skills

Languages: Java, Python, PostgreSQL, JavaScript, HTML/CSS, C, C#
Frameworks: React, Node.js, Express.js, Bootstrap, TailwindCSS, .NET
Developer Tools: Git, Docker, VS Code, Visual Studio