


# Spencer Cowles

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## EDUCATION

### University of California, San Diego

La Jolla, CA

*Bachelor of Science in Mathematics-Computer Science, **Minor** in Economics*

*Sep 2023 - Jun 2027*

Relevant Coursework: Linear Algebra, Data Structures and Algorithms, Graph Theory, Systems Programming, Optimization in Data Science, Machine Learning Algorithms, Theory of Computation, Machine Learning in Physics

## EXPERIENCE

### Full Stack Developer Intern

Jun 2025 – Present

*BusinessRate*

*Phoenix, Arizona*

- Led development of a **full-stack Next.js/React application** to modernize BusinessRate's website with improved SEO to drive customer engagement, achieving a **30%** increase in organic traffic within 3 weeks of launch.
- Designed **RESTful API** endpoints and PostgreSQL queries using Kysely ORM, indexing **28,000,000+** businesses for fully type-safe search from our own ranking algorithm, using backend web development best practices.
- Optimized performance using **AWS Amplify** (Amazon Web Services), decreasing page load times by up to **80%** by leveraging server-side rendering, code-splitting, and image optimization techniques for a seamless user experience.

### Software Engineering Intern

Mar 2025 – Jun 2025

*KlonitAI*

*San Diego, California*

- Engineered a production-ready **SQL Connector** for the Model Context Protocol (MCP) in a team of 4, leveraging GitHub for version control and collaborative development, enabling seamless LLM access to live PostgreSQL data.
- Developed endpoint test harnesses to simulate edge-case queries and conducted extensive unit/integration tests, achieving **100%** test coverage and minimizing critical failures in production.
- Utilized **Python**, **Node.js** and **PostgreSQL** to integrate KlonitAI's LLM platform with external databases, reducing query latency by **45%** and enabling access to **25,000+** records across relational schemas.

### Software Team Member

Jun 2024 – Apr 2025

*Triton Unmanned Aerial Systems*

*San Diego, California*

- Enhanced mission performance by **30%** by integrating midflight mapping logic, allowing the drone to process terrain data while navigating, coding in **C++** and **Python** to develop maintainable, well-documented code.
- Implemented advanced pathfinding strategies including **A\*** and **RRT\***, enabling adaptive obstacle avoidance and multi-target routing, which improved target acquisition accuracy by **25%** during simulation testing.
- Designed and executed simulation-based unit and integration tests using custom test harnesses, reducing flight system bugs by **12%** and increasing codebase reliability under time-constrained competition scenarios.

## PROJECTS

### barraCUA | *JavaScript, Python, Chrome Extensions (MV3), Gemini API, Deepgram, Playwright*

Jan 2026

- Winner at SB Hacks 2026** for building an AI-powered, **agent-driven accessibility tool** that understands on-screen content and **takes actions on behalf of users**, enabling conversational web navigation.
- Developed a **multimodal Chrome extension** that can visually interpret webpages, answer contextual questions, and perform browser actions using **Google Gemini** for screen understanding and agentic decision-making.
- Engineered a real-time voice and automation pipeline using **Deepgram** (STT/TTS) and a **Python + Playwright** backend over WebSockets, enabling low-latency interaction and autonomous control of authenticated user sessions.

### Not Red Shirt | *Python, JavaScript, React, MongoDB, LangChain, HTML/CSS*

Apr 2025

- Winner of 2 awards at DiamondHacks 2025:** Best Use of MongoDB and Best E-Commerce Innovation
- Constructed a full-stack semantic search engine for e-commerce that processes natural language queries with negations (e.g., "**not red shirt**"), decreasing no results found from search by **60%**.
- Processed **1.4M** Amazon listings and filtered **260K** clothing items; leveraged LangChain to create our vector embeddings and generated **1536**-dimensional vectors to power semantic search from our vector database
- Integrated text, voice, and image input support into the frontend, improving accessibility and increasing user task completion rate by **40%** in user testing sessions by allowing users to search in their preferred modality.

## SKILLS

**Languages/Frameworks:** Go, Java, Python, C++, TypeScript/JavaScript, HTML/CSS, React, Node.js, PostgreSQL

**Other Skills:** Agile, RESTful API, Kubernetes, AWS (Amplify, S3, Lambda), Web Development, Unit Testing, Git