# ALEX STRAIGHT

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## PROFESSIONAL SUMMARY

I'm an early-career software engineer who enjoys blending creative front-end design with robust back-end systems. I'm experienced with React and Next.js, and recently built a real-time multiplayer Pictionary game powered by a Go WebSocket server. Currently, I'm working on developing a 2D game engine in Zig, driven by a passion for tackling challenging problems and staying ahead of industry trends.

## SKILLS

**Skills:** TypeScript, Go, Zig, C/C++, Python, React.js, Next.js, HTML/CSS, Linux/Unix, Docker, REST APIs, WebSockets, Git, AWS, SEO

## PROFESSIONAL EXPERIENCE

**San Diego State University** **San Diego, CA, USA**
*Teaching Assistant, Data Structures & Algorithms* *August 2024 - May 2025*

- Held regular office hours to help students debug code, clarify algorithmic concepts, and deepen their understanding of time and space-complexity.
- Graded homework assignments and exams, providing actionable feedback that guided students toward more efficient and correct solutions.
- Developed and maintained an interactive pathfinding visualizer, still used in the course to demonstrate the mechanics of algorithms like Dijkstra's, A*, and BFS in real time.

**Academic Assist** **Remote**
*Front-end web developer* *March 2024 - May 2024*

- Developed and implemented SEO strategies using Next.js, improving search rankings and site visibility.
- Revamped the home page per Figma designs, enhancing user experience and engagement.

## PROJECTS

**2D Physics Engine (Zig)**
• Custom 2D engine implementing rigid-body dynamics and collision detection via the Separating Axis Theorem.
• Engineered numerical stability controls and sleep detection to optimize long-running simulations.
• Built a debugging visualization layer showing velocity vectors, collision points, and object states.
**Pictionary with Friends (Go, TypeScript, React, Fabric.js)**
• Real-time multiplayer drawing & guessing game using WebSockets for sub-100 ms stroke broadcast.
• Developed the Go server to synchronize game state and handle turn logic at scale.
• Created an interactive canvas toolbar in TypeScript with Fabric.js and Framer Motion animations.
• Deployed on Vercel for live remote play with support for multiple concurrent sessions.
**Enhanced Mathematical Recognition with Donut + mBart Integration (Pytorch)**
• Developed a hybrid vision-and-language model to accurately parse handwritten equations.
• Integrated Donut's OCR backbone with mBART for contextual LaTeX output.
• Evaluated on 500 test samples, achieving a 92% symbol-level accuracy.

## EDUCATION

**San Diego State University** **May 2025**
*Bachelor's, Computer Science* *GPA: 3.8*

- Dean's List (3x)
- Research Assistant: Optimized non-orthogonal multiple access (NOMA) systems with intelligent reflecting surfaces (IRS) using the BFGS algorithm to boost data rates.