Tristan Spear

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Education

Cal Poly, San Luis Obispo — San Luis Obispo, CA
B.S. Software Engineering - GPA : 3.76 (Including CC) — *Jul. 2025 - May 2028 (Expected)*

Relevant Courses: Data Structures, OOP, Algorithms, Systems Programming, Computer Organization, Computer Security, Artificial Intelligence, Software Engineering I & II

Technical Skills

Languages : Java, Python, C/C++, SQL, Assembly Language, Javascript, HTML/CSS
Frameworks & Libraries : React, Bootstrap, JQuery, Express.js, Axios, Postgres
Developer Tools : Git, GitHub, VS Code, IntelliJ, CLion, Figma

Experience

Full Stack Developer — Sep. 2025 - Present
Hack4Impact Cal Poly — *San Luis Obispo, CA*

- Implement full-stack features for nonprofit clients (Ecologistics, Habitat For Humanity) using **React, Express, MongoDB, and Next.js**, contributing to production code used by real organizations
- Build and integrate REST APIs to support frontend workflows and features, collaborating with designers to translate Figma designs into responsive UI components
- Coordinate development tasks within a **10-person engineering team**, working closely with tech leads to scope features, review pull requests, and meet sprint deadlines
- Practice **Agile development** through sprint planning, stand-ups, and retrospectives, delivering features within sprint timelines

AI Researcher — Jan. 2024 - Jun. 2024
Cal Poly, San Luis Obispo — *San Luis Obispo, CA*

- Built an AI-powered chatbot to answer student questions about Cal Poly staff, academics, and senior projects, working in a **5-person research team**
- Designed and implemented a **user interest survey** to collect structured feedback and improve LLM responses through prompt tuning and data refinement
- Managed project milestones and deliverables independently, meeting weekly deadlines, while balancing coursework

Computer Science Tutor — Jan. 2024 - May 2025
M.E.S.A Program - Cuesta College — *San Luis Obispo, CA*

- Provided one-on-one and small group tutoring for core CS classes, including **Intro to Programming, Data Structures, Object-Oriented Programming, Computer Organization, and Discrete Math**, supporting students across multiple semesters
- Assisted students with **Java, Python, C/C++, and Assembly Language**, helping debug code and clarify how code executes across different abstraction levels
- Served as lead tutor for the MESA program, completing 400+ tutoring hours, and supporting 30+ students, through sustained, semester-long academic improvement

Programming & Robotics Instructor — May 2024 - Aug. 2024
ID Tech Camps - Stanford University — *Stanford, CA*

- Led and instructed week-long engineering courses in VEX robotics and programming, teaching Python and C++ to middle and high school students
- Independently managed classrooms of **10-14 students**, adapting instruction to different skill levels while maintaining structured timelines
- Developed lesson plans and technical exercises to reinforce core programming concepts and problem-solving skills

Projects

Custom Memory Allocator (C, C++) (see here) — Oct. 2025 - Nov. 2025

- Implemented a custom malloc/free allocator in C using sbrk/brk, managing dynamic heap with block header information to track block sizes, allocation state, and neighboring memory blocks.
- Implemented a best-fit allocation strategy with block splitting and merging of adjacent free blocks to reduce fragmentation
- Created C++ version with simulated heap and program break, mimicking low level behavior to allow testing on MacOS