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 2027 (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*

- Hack4Impact is a 501(c)(3) non profit organization that builds software for other non profits
- Work in a team with 10 developers, 2 tech leads, and 4 designers to build full stack applications for non profit orgs
- Follow the software development lifecycle and agile principles
- Work on React, Express, Mongo DB, Next.js tech stack
- Currently building full stack applications for **Ecologistics**, and **Habitat for Humanity**

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

- Collaborated with 4 other computer science students to build an AI chat bot that could give useful information and answer questions about Cal Poly, Cal Poly staff, and senior project ideas
- Followed a schedule and deadlines to complete different sections of the project successfully and efficiently
- Implement a user survey which asks students their interests and what they need assistance with, to tune the LLM

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

- Interned at Stanford University, working as an instructor for a pre collegiate engineering camp
- Taught a class on VEX robotics and robotics programming in Python & C++
- Taught 8 separate week long classes of 10-14 middle school and high school students
- Created lesson plans and chose supporting materials to promote positive learning experiences.

Projects

Image Compressor & Decompressor (see here) — Nov. 2025 - Dec. 2025

- Built a full BMP image compression and decompression system in C, using Huffman encoding and and custom file formats for pixel-level data reduction
- Implemented frequency analysis and Huffman tree construction for RGB channels, using bit-level packing for efficient storage
- Implemented configurable quality/loss factor for adjustable compression ratio and image fidelity

QR Code Generator with URL Shortening (see here) — Oct. 2025 - Dec. 2025

- This site was made for for clubs & organizations at Cal Poly, who often dealt with the nuisance of their free qr codes expiring
- I built an external link-shortening API that stores full links in a database and returns a redirect link, to keep qr code size small
- I used Bootstrap, EJS, Express.js, Axios, Postgres and a data encoding npm package, and deployed on Vercel