Sullivan Hart

sullivanhart.github.io

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Education

- **Iowa State University** — Ames, IA
  Master of Science in Computer Engineering — *Aug. 2025 – Dec. 2026*
  Bachelor of Science in Computer Engineering; GPA: 3.74/4.00 — *Aug. 2022 – Dec. 2025*

Experience

- **IBM** — Rochester, MN
  Hardware Developer Intern – Quantum Team — *Summer 2026*
- **Garmin** — Salem, OR
  Design Engineering Intern – FPGA Team — *Summer 2025*
  - **VHDL Channelizer**: Developed a filter in VHDL, including filter design, hardware modeling in Python, and custom simulations. Responsible for the entire design cycle – research, prototyping, implementation, and verification.
  - **Digital Signal Processing**: Applied principles of multirate DSP to improve resource utilization on an FPGA.
- **Garmin** — Olathe, KS
  Software Engineer Intern – NAV Team — *Summer 2024*
  - **Aviation Navigation Software**: Implemented features and fixes including low-level GPS sensor data processing, user interface improvements, and high-level navigation logic.
  - **Turn Behavior Improvements**: Developed logic to dynamically adjust route based on a variety of factors; new functionality addressed customer concerns.
  - **NAV Speed Debugger**: Built an internal tool to debug route generation issues and visualize flight path data; decreased investigation time by visualizing data in a convenient way.
- **Iowa State University** — Ames, IA
  Operating Systems Teaching Assistant — *Jan. 2025 – May 2025*
  - **Lab Instruction**: Independently led 40+ students across 2 lab sections weekly. Instructed students on topics such as CPU scheduling, file systems, and multithreading. Guided students through hands-on implementations in Linux using `pthreads`, `fork()`, `exec()`, and other key system calls. All development was done in C.
  - **Course Support & Evaluation**: Graded students' programming projects, weekly lab reports, and exams. Delivered supplementary instruction on topics such as CPU architecture, virtual memory, and multithreading.
- **Walton's Grizzly Lodge** — Portola, CA
  Camp Counselor — *Summer 2023*
- **Kerfoot Canopy Tours** — Belle Plaine, MN
  Zipline Guide — *Summers 2022 & 2023*
- **Camp Phillippo** — Cannon Falls, MN
  Camp Counselor — *Summers 2019-2021*

Projects

- **Automated Parking System (Senior Design)**: Leading hardware and ML development for a CV-based parking monitor. Deployed YOLOv8 via Docker on Raspberry Pi with multiple cameras for real-time vehicle detection. Designed and soldered custom electronics, built an image processing pipeline and database. Developing a modular, robust, and documented system.
- **Riff Radar (Concert App)**: Led frontend dev for an Android app that simplifies concert discovery. Integrated Spotify, Ticketmaster, and Stripe APIs for artist previews and ticketing. Built a real-time chat system for artist-venue coordination. Displayed Ticketmaster and user-created events side-by-side, removing the barrier of entry to concert hosting.
- **4-Mode Digital Potentiometer and Amplifier IC**: Designed a CMOS IC with four modes: non-inverting amplifier, inverting amplifier, digital potentiometer, and 4-bit DAC. Supported 16 steps using a 4-bit control signal. Implemented a resistor ladder with transmission gates and decoder logic. Created schematic and layout in Cadence Virtuoso; passed DRC and LVS.

Activities

- **Chem-E Car** — *Fall 2024 – Present*
  Electronics Team Lead
- **Engineers for a Sustainable World** — *Fall 2022 – Present*
  Solar Team Lead
- **Birding Club** — *Fall 2023 – Present*
- **Mountaineering & Climbing Club** — *Fall 2022 – Present*

Other

- **Skills**: Embedded Systems, Digital Design (VHDL), C, Java, Python, Linux, Docker, Git
- **Interests**: Rock Climbing, Mountain Biking, Tennis, Quilting, Classic Motorcycles
- **Awards**:
  ISU Dean's List — *All Semesters*
  2nd Place – Chem-E-Car Conference — *Spring, 2025*
  Best Coder – COM S 309 — *Spring, 2024*
  3rd Grade Bus Rider of the Month — *March, 2013*