Eliot Wachtel

eliotwachtel.com linkedin.com/in/eliotwachtel github.com/TheHolyQuail

Education

University of California, Santa Cruz **Expected graduation: Fall 2024**

Bachelor of Science (B.S.) in Robotics Engineering *Santa Cruz, CA*

Minor: Electrical Engineering - Honors: Dean's list Winter 2020, Spring 2023, Winter 2024 *GPA: 3.7*

Experience

Undergraduate Student Researcher **Feb. 2023 – Ongoing**

Braingeneers Lab under Dr. Mircea Teodorescu *Hybrid work: Santa Cruz, CA*

- Designed a tile-able PCB to expand servo PWM lanes, allowing per-servo control of a 50+ servo system
- Communicated with board house to ensure proper board production through two versions
- Currently integrating into overarching system writing code and designing power circuitry

Electrical Systems Lead **Jun. 2023 – Ongoing**

Formula Slug, UC Santa Cruz EV FSAE team *Hybrid work: Santa Cruz, CA*

- Manage the design and fabrication of the high and low voltage electrical systems for an electric rally car
- Mentor and guide new members in electrical theory and circuit design
- Lead meetings and provide updates and estimates on progress

Senior Electrical team member **Jun. 2023 – Ongoing**

Autoslug, UC Santa Cruz applied AI/ML club *Hybrid work: Santa Cruz, CA*

- Design PCBs in KiCAD, Altium, and Fusion 360 for a modular robot
- Direct and manage the electrical system design of a modular robot
- Designed mechanical parts and source electrical components for a swerve drive module

Mechatronics Engineering Intern **Jun. 2022 – Aug. 2022, Jun. 2023 – Aug. 2023**

Gener8 *In-person work: Sunnyvale, CA*

- Wrote Python scripts to control ARM based hardware for sub-micron flexure actuation and heating element tests
- Performed data analysis and graphing for customer facing presentation on prototype test data
- Sourced components for prototyping, including outlining requirements, quoting, and purchasing a customized product
- Designed fixtures and prototype geometry for subsystem validation and assembly
- Designed PCBA layouts, mounting brackets, and functional parts in SolidWorks, adding them to subsystem assemblies
- Modeled all parts for manufacture with 3D printing, milling, and sheet metal

Student Instructor, Group Tutor, Reader **Sep. 2021 – Ongoing**

UC Santa Cruz, Rachel Carson and Computation Media Department *Remote/in-person work: Santa Cruz, CA*

- Develop and teach content with co-instructors as part of a university sanctioned course on the electrical design process
- Design and write prelabs, lab assignments, quizzes, lecture slides, demos, activities, and accompanying guides
- Lecture and provide live demonstrations on technical concepts, fielding and answering questions
- Topics covered in the course: basic circuit analysis with math and benchtop test equipment, part sourcing and Bill of Materials, basic circuit design with 555 timer IC and buck converter controller ICs, soldering, PCB design for manufacture, and the engineering design cycle
- Lead author writing a case study on student-taught courses accepted by the 2024 ASEE Annual Conference & Exposition

Electrical Lead, Research Co-Lead, President **Sep. 2020 – Jun. 2023**

Slugbotics (UC Santa Cruz Robotics Club) *Remote/in-person work: Santa Cruz, CA*

- Ideate, design, and develop circuits and systems using EAGLE, Fusion 360, Solidworks, and OnShape
- Lead meetings, plan meeting agendas, and distribute tasks with team leadership, managing 30 people across three teams
- Past projects involved with: CITRIS Aviation Prize 2021, FAA Airport Design Challenge 2020, MATE underwater robotics, autonomous fleet tracking, combat robotics, and a laboratory move

Projects (more examples at eliotwachtel.com/portfolio)

Intro to Mechatronics Final Project **Apr. 2023 – Jun. 2023**

- Designed a laser cut frame that maintained its shape without adhesives
- Robot designed in Onshape with 360 degree collision detection, and omnidriectional drive
- Designed op amp based circuits to isolate 2 and 1.5KHz signals using multiple feedback bandpass filters
- Programmed a hierarchical state machine running with a real time service handler in C
- Acted as project manager, ensuring components were created on time and could be integrated together
- Developed a modular interconnect system to speed up assembly and repair

Underwater Camera Ring Light System **Oct. 2021 – May 2022**

- Designed a four-ring underwater lighting system to provide lighting for nocturnal operations at 15 meter depths
- Developed a system composed of a 12 to 31 volt boost converter, current regulating LED driver circuit, and 20 watt, 3,250 lumen light ring with integrated passive cooling
- Designed and documented using Autodesk EAGLE, GitLab, and Maker.io

Pocket Connect Four **Jun. 2021 – Aug 2021**

- Designed an approximately credit-card-sized game of connect four, utilizing a grid of WS2813 LEDs as the game board.
- Developed a system composed of an LED grid, five button control pad, and an ATTINY microcontroller with micro USB power input
- Gameplay programmed in Arduino IDE using C++, ATTINY programmed using Arduino UNO as serial programmer
- Designed and documented using Autodesk EAGLE, GitLab, and Maker.io

Technical Skills

CAD, 2D design, video editing: SolidWorks & PDM, Fusion 360, Onshape, EAGLE, Altium, SketchUp, Gimp, Adobe Illustrator, Inkscape, Shotcut

Business: Microsoft Office, Google Suite, Adobe Acrobat, Slack, Kanban software, LaTeX

Programming Languages/tools: Python, Java, C/C++ (MPLab), HTML/CSS + JavaScript, Git, Bash, MIPS Assembly, Vivado TCL

Machining and Shop:

Mechanical: Hands-on experience with CNC and manual machining of common metals, plastics, wood, and composites on most common wood and metal shop tools with additive, subtractive, and joining methods (including welding, riveting, threaded fasteners, bolts, and adhesives)

Electronics: Experience soldering (through hole and SMD), crimping, and using common bench top equipment

Misc: sewing (hand, machine, and CNC), digital and mechanical metrology, and most standard hand and power tools

Languages: English (Fluent), Spanish (Conversational and Written)