Gabriel L. Rubin

Los Angeles, CA | (707) 338-2786 | the.gabriel.rubin@gmail.com | www.linkedin.com/in/the-gabriel-rubin

An experienced engineer and uplifting team player with a dedication to transformational technologies and a proven track record of excelling in uncertain and innovative environments.

Languages: C++, C, Python, ARM Assembly, TypeScript, CSS, HTML, PHP, SQL, G-Code, Matlab
Software: Test-Driven Development, CI/CD, Finite State Machine, Real-Time Computing (FreeRTOS), Data Structures, Algorithms, Resource Constrained Computing, Distributed Systems, APIs, Parallelism, Concurrency, Architecture, BLE, Bare-metal
Computer Tools: CAD (Onshape, Solidworks, KiCad), Linux, Bash Scripting, GIT, GDB, AWS, Microsoft Suite, LabView
Hardware: Prototyping, Oscilloscope, Function Generator, Multimeter, DAQ, Logic Analyzer, Signal (Processing, Filtering, Conditioning), Sensors, Communication Protocols (SPI, I2C, UART, CAN, RS232), Microcontrollers (SiWG917, nRF, STM32), RPi

Experience:

Founder & CEO, Entoboros LLC *2022 Sep-Dec 2024*
- Conceptualized BLE distributed mesh sensor network for environmental data acquisition using C++/C on nRF52/3.
- Co-authored *North America Coalition of Insect Agriculture's Best Practices guide*.
- Conceptualized and built an automated environment pilot and research facility for insect (Hermetia illucens) rearing, waste processing, and diet formulation.
- Designed custom LED light with adjusted frequency spectrum for optimal Hermetia illucens breeding.
- Facilitated partnerships with local and international businesses for research, testing, and GHG divergence.
- Developed a Python program to systematically examine USDA data for population correlation between bovine, poultry, and swine to identify high impact areas for better manure management practices and reduced foreign dependence of protein sources in animal feedstocks.
- Innovated backyard-compostable packaging, including proprietary adhesive.

Consultant, Software & Embedded *2021 Jan-Dec 2023*

Client #1
- Leveraged Python, NumPy, and pandas to create a data processing pipeline to clean, restructure, and unify daily environmental data, with multi-year Salmonid radar data.
- Generated statistical analyses and data visualizations using Python and MatPlotLib that informed operational and environmental resource management decisions.

Client #2
- Re-architected and re-developed entire RPi based product portfolio for an automated LED and display system supporting Gregorian and Hebrew calendars.
- Created extensible data endpoint, schema, and data pipeline.
- Re-developed UI using CSS, PHP, and HTML.
- Designed circuits for signal conditioning, LED power, and LED driver to minimize cost and maximize reliability.
- Wrote LED driver software to interface RPi with long strands of 1,000+ singly addressable LEDs in C++.
- Developed custom Systemd services in C++ utilizing X11 and xRandr to automate HDMI display output selection.

Systems & Software Engineer, Apple *2018 May-Dec 2020*

Apple Vision Pro
- Ported team's daemon from existing platforms.
- Developed tooling for system stabilization.
- Adapted team's logging framework to enable data acquisition and algorithm development.
- Supported data replay pipeline for algorithm development.

Sensor Logging Platform Architect
- Re-architected multiprocessor sensor logging system into a runtime adaptable weakly linked thread-safe framework.

Mac Catalyst Developer
- Converted team, internal, and developer frameworks to support multiple platforms and system architectures.

Data, Pipelines, and Visualizations
- Created an extensible, AWS-based, parallelizable, large-scale health protected data pipeline for data manipulation and visualizations, utilized across a variety of feature level projects.
- Designed a data standard to be used cross functionally, internally, and externally for study partners.
- Developed a data processing pipeline to segment contiguous data based on daily uploaded user database entries and user data for algorithm software development and back testing.

Bug Tracking
- Owned and maintained motion and fitness bug tracking for the Stand Hour and Exercise Minute features across the public population and a 20,000+ internal user live-on population.
- Created tooling to automate bug tracking to reduce time spent by developers triaging issues.

Misc.
- Created testing framework for team's internal algorithm framework with 100% coverage.
- Prototyped a Finite State Machine state viewer app.
- Supported Spatial Audio implementation.

Leadership and Culture
- Mentored new team members.
- Managed team's hardware inventory of 200+ devices.
- Founded the Apple Ice Hockey Team.

Education:

B.S. Engineering, Dean's List, Harvey Mudd College

Patent(s) & Award(s):

- Automated Coupling of an implement to an implement carrier of a power machine – US US20190338809A1 – Filed
- J.R. Phillips Award for demonstrating excellent experimental technique and engineering judgement (HMC E80)

Additional Experience:

Doosan Bobcat, Engineering Clinic *2017 Sep-May 2018*
- Automated machine function that requires skilled operators.
- Developed and utilized a dynamic model of the machine for use in a control system.
- Implemented a program for the control system in C.
- Utilized LIDAR sensors and image processing for system feedback.
- Interfaced with machine using C, microcontrollers, and CAN bus protocol.
- Simulated control system in MATLAB.
- Patented: Automated Coupling of an implement to an implement carrier of a power machine – US US20190338809A1 - Filed.

Custom MIDI Keyboard, HMC *2017 Nov-Dec*
- Worked on a two-person team to design and implement a customizable system to interpret MIDI commands, outputting the desired waveform at the desired frequency.
- Used RPi to interpret MIDI commands over USB.
- Adapted a MIDI library in C to process custom commands and send data over SPI.
- Used SPI to communicate between a RPi 3.0 and a Cyclone IV FPGA.
- Interpreted FPGA SPI for dynamic waveform generation.
- Used I2C to interface between Cyclone IV FPGA and DAC.

SpectraSensors INC., R&D Intern *2017 May-Aug*
- Developed automated testing system to obtain laser features.
- Created an automated testing script to interface with a large-scale oven using minimal Modbus in Python.
- Automated transfer function characterization of an undocumented temperature controller subsystem, using LabView, a SCPI enabled signal generator, an NI PCI DAQ, and a Python script to process and plot data from LabView.

Amazon Lab126, Engineering Clinic *2016 Sep-Dec*
- Designed and created a configurable microphone array harness on a team of five students to support beamforming algorithm development.
- Provided support for automated testing using a command line interface with 5.1 surround sound and synchronous audio playback.
- Featured onboard speakers supporting both stereo and mono output.

Voodoo Manufacturing Intern *2016 May-Aug*
- Developed a safety plan for the 3D printing startup and assisted in planning and execution of a factory redesign.
- Trained new hires and implemented continuous improvement methods for optimization and improved workflow.
- Ran a design of experiments to determine a better method of maintaining level build plates through data acquisition and analysis using a custom 3D printed dial gauge mount designed in Onshape.

3D Trajectory Mapping of a Rocket, HMC *2016 Jan-May*
- Created a 3D trajectory mapping of a fiber-glassed reinforced rocket with a four-person team.
- Used redundant measurement systems with data logging to verify data obtained by an inertial measurement unit on an onboard circuit with filters.
- Ran simulations prior to launch using data obtained from rocket to estimate flight characteristics.
- Awarded J. R. Phillips Award for demonstrating excellent experimental technique and engineering judgment.

Smart Hive, HMC Summer Research *2015 Jun-May 2016*
- Created an Arduino based data logging system that counts bees entering and exiting a hive and hive weight.
- Debugged a custom PCB.
- Designed a circuit to accommodate preferred sensors and data logging as well as a second PCB to interface between load cell and Arduino using serial to TTL communication.
- Designed a 3D printed custom sensor and PCB housing in Solidworks which allowed for one bee entry or exit through a path at a given time to assist with data logging.

Personal Projects:

C++ HSV RGB Color library *Jun 2024*
- Developed for use on the nRF52/53 families of devices.

PCM to audio pipeline *Jun 2024*
- Used nRF52/53, DAC, and Audio amplifier prototype.

Automated aeroponic plant growing system *Jan 2022*
- Used array of piezo-foggers, fans, and indoor grow lights.
- Automated using a programmable internet connected power strip in LUA.
- Optimized to reduce grid burden, energy consumption, and cost based on local utility company's schedule.