Monty Choy

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montychoy.com | linkedin.com/in/montychoy | github.com/mochoy | suild.com

Education

California Polytechnic State University, San Luis Obispo **(Junior) Expected Jun. 2022**
BS Electrical Engineering - 3.95 Major GPA *San Luis Obispo, CA*

- Dean's List; Hyperloop Control Systems lead, SLO Breakers, EE Mentor, Yu-Gi-Oh Club

Experience

Microsoft **Jun. 2020 - Sep. 2020**
Software Engineering Intern - Surface Duo Firmware Engineering *(Remote) Sunnyvale, CA*

- Brought-up, integrated, & developed sensor device driver on Qualcomm Snapdragon SoC
  - Deployed driver for commercialization on the Surface Duo for use by 1M+ customers
  - Debugged hardware, system integration, & registry loading for successful driver operation
  - Debugged unresponsive hardware: used logic analyzer to analyze I2C traffic & PI
  - Configured dual sensor instance & exposed sensors to Android framework in C & C++
  - Programmed hardware register configuration functionality from external sensor entities
- Developed Android app, Android framework, & native libraries for modem configuration

Apple **(9 months) Jan. 2019 - Sep. 2019**
Hardware Engineering Intern - Apple TV Hardware Engineering *Cupertino, CA*

- Designed electrical, mechanical, & software system to characterize IR performance
  - Developed embedded abstraction layer on STM32 MCU for closed-loop motor control, LCD drives, sensor/peripheral control, & I2C & UART communication
  - Programmed Python application as flexible entry point into embedded systems over USB
- Architected, prototyped, & designed HDMI dev platform PCB. Design lead for DC-DC power, USB, & debug subsystems. Collaborated on high-speed digital (HDMI) & MCU subsystems
- Led validation, debug, & FA efforts: HDMI (CTS), PMU, SoC, UART, NAND, PCIe & PDM mic hardware subsystem, & multilayer PCB failure
  - Debugged SAR ADC current & voltage measurement tracking on PMU's multiphase buck
  - Conducted HDMI CTS testing across process corners. Debugged eye opening compliance & configured PHY output behavior. Explored high-speed digital PHY & board-level design
- Analyzed A-series SoC thermal & power performance across temperature & process corners
  - Wrote Python scripts for Serial data collection to measure long-term device performance
  - Explored internal CPU & GPU performance & thermal throttling mechanisms
- Analyzed test coverage on factory line to ensure correct placement, value, etc. for every component at each test station. Increased component test coverage by over 25%

Suild **Nov. 2016 - Jul. 2020**
CEO *San Francisco, CA*

- Designed, coded, manufactured, tested, & shipped pcb-based electronics products implementing AVR MCUs, USB, UART, DC-DC converters, & PID controlled inductive loads
- Shipped 1k+ units to 10+ countries on webstore with 30k+ annual sessions & $15k+ revenue
- Deployed frontend, backend, & system architecture e-commerce website with MERN stack
- Developed documentation hosting functionality & interactive web applications
- Programmed AVR MCUs for PID controlled inductive loads to meet hardware spec

Projects

Find more at suild.com & montychoy.com

Select-Fire Nerf Rapidstrike Kit - suild.com/shop/4 **Jun. 2019 - Jul. 2020**

- Designed PCB-based product for select-fire inductive pusher control in modified Nerf blasters
  - Manufactured, shipped, & sold 300+ units to 10+ countries
- Implemented programmed MCU, DC-DC power, & PID inductive drive hardware subsystems

RISC-V MCU **Apr. 2018 - Jun. 2020**

- Designed MCU & microarchitecture to implement RISC-V ISA in SystemVerilog on FPGA
- Wrote test benches to validate hardware modules before & after system integration

Epic Buck Converter **Aug. 2020 - Present**

- LTspice simulation of ideal & non-ideal, single phase, open-loop, continuous mode buck converter with synchronous rectification

Suild.com - suild.com **Feb. 2018 - Jul. 2020**

- Webstore that receives 30k+ annual sessions & processes $15k+ revenue
- Hosts interactive web applications, technical documentation, & e-commerce functionality
- Built with React, Node.js, Express, Mongo DB, Google Analytics, Paypal API

Flywheel Setup Picker - suild.com/tools/flywheel-setup-picker **Nov. 2019 - Jun. 2020**

- "Reddit for Nerf blasters" - Interactive web application to submit, view, find, filter, sort, vote, & comment on modified Nerf blaster configuration that receives 5k+ annual sessions at Suild.com
- Built with React, Node.js, Express, Mongo DB, Material-UI, & SASS

TeleMentary Box - *First Place Google Cloud Platform, SLO Hacks 2020* **Feb. 2020**

- Personal security locker to prevent package theft with live-streaming facial detection & gps
- Deployed React application & GCP firebase, facial detection, & machine learning cloud functions

Technical Skills

- **Hobbies:** Breakdancing, Yu-Gi-Oh, wrestling, board games (Dominion, Grifters, Coup), cooking

Electrical Engineering:

- **Hardware Engineering:** MCUs, I2C, SPI, CAN, USB, UART, HDMI, PCB layout & design, test coverage & HW validation, computer architecture, RISC-V ISA, high-speed digital design
- **Power Electronics:** DC switching regulators, inductive drives, MOSFET drives, LiPo batteries
- **Software Engineering:** C, C++, Python, firmware, scripting, device drivers, HAL

IC Design

- **Analog Design:** DC switching regulators, high-speed PHYs, MOSFET, SAR ADC, PLL
- **Digital Design:** Computer architecture, RISC-V ISA, microarchitecture, RTL, SystemVerilog
- **Software Engineering:** C, C++, device drivers, Python, scripting

Software Engineering:

- **Software Engineering:** C++, C, firmware, RISC-V ISA & assembly, Python, Java, JavaScript
- **Web Development:** React, Node.js, Mongodb, JavaScript, Python, HTML, CSS, JSON, npm
- **Embedded Programming:** C, C++, device drivers, HAL, RISC-V, computer architecture
- **Hardware Engineering:** MCUs, I2C, SPI, USB, UART, motor control, computer architecture

Embedded Systems Programming:

- **Embedded Programming:** C, C++, device drivers, HAL, RTOS, RISC-V ISA & assembly
- **Hardware Engineering:** MCUs, I2C, SPI, USB, UART, HDMI, PCIe, high-speed digital design, MOSFETs, OSI PHY layer design, test coverage & HW validation, computer architecture
- **Software Engineering:** Python, Javascript, HTML/CSS, Java, Git

Web Development:

- **Web Development:** React, Node.js, Mongodb, JavaScript, Python, Google Cloud Platform
- **Software Engineering:** C++, C, firmware, RISC-V ISA & assembly, Python, Java, Git