

Jesse Cheung

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Embedded Software / Hardware Engineering
San Francisco, CA

EDUCATION

- **University of California, Berkeley** Berkeley, CA
Computer Science, B.A & Electrical Engineering and Computer Science Minor *Expected Grad: December 2024*
Relevant Courses: Designing Info. And Sys. Devices I & II, Hands on PCB Engineering (HOPE), Electronics for the IoT, Computer Architecture (Machine Structures), Embedded Systems and Cyber Physical Systems, Digital Design and Integrated Circuits, Nanorobotics
Current Courses: Operating Systems and System Programming, Microelectronics
- **City College of San Francisco** San Francisco, CA
Relevant Courses: Computer Architecture and Assembly, UNIX 160A. *Grad: July 2022*
Programs: MESA Scholar Student, Computer Science Transfer, Mathematics Associate Degree

SKILLS SUMMARY

- **Programming Languages:** C, C++, Verilog, RISC-V Assembly, JavaScript (NextJS), Java, Python
- **Platforms & Tools:** Eclipse IDE, Visual Studio, KiCad (PCB Design) — Git, CMake, Make, Bazel, Jenkins
- **Hardware Tools & Protocols:** ESP32, STM32, Raspberry Pi, Arduino — I2C, UART, MQTT, WiFi, BLE, ESP NOW

RELEVANT EXPERIENCE

- **City College of San Francisco Engineering Dept.** In-Person
Student Lab. Aide (Part-time) *Jan 2022 - May 2022*
 - **Programming:** Created a simulated call center program that worked on Softbank's Pepper NAOQI Robot in Python which simulated movement and speech recognition in a robot to test its capabilities
 - **Teamwork:** Worked with Choregraph IDE and NAOQI's standard library built 5 years ago with a team of 5 other students

PROJECTS

- **Port: Small Scale automated Port System (github.com/jessecheu/port):** Built a system of autonomous cargo vehicles using 3pi+ pololus with ESP32 connected for wireless communication. Used UART communication to connect between a RP2040 and ESP32 microcontrollers. Used ESP NOW and bluetooth for wireless communication. Developed the autonomous line following for the cargo vehicles using a PID Controller and lines on the ground. Developed a strategy for localization by using modular arithmetic. Integrated multiple cranes to be able to load and unload cargo to the vehicles.
Tech Stack: C, Lingua Franca, ESP32, RP2040, ESP NOW, Bluetooth, UART, Arduino IDE, 3pi+ Pololu, CMake
- **PCB Design: Weather Station**
w/ Solar Power System and NB-IoT Transceiver
 - **Hardware:** Designed the whole system from PCB tape-out to it's bring-up process. Includes a solar panel and MPTT Solar Charging w/ optical, humidity, temp, and pressure sensors. NB-IoT Transceiver w/ cellular 5G Antenna and eSim receptacle.
- **Voice Controlled Electric Car w/ unsupervised learning:** Breadboard to an operable three wheel car built using basic passives, and a mic-board all powered by a 9V Battery, unsupervised learning for voice control, and closed-loop control model for driving straight and turning.
Tech Stack: Arduino Microcontroller, C, Control & Circuit Theory, Breadboard Prototyping
- **FPGA Prototyping: RISC-V CPU:** Built a 3 Stage pipeline RISC-V CPU from scratch including the datapath, control logic, and forwarding w/ hazard handling. Prototyped the CPU to a FPGA that could run C programs. Used SystemVerilog for verification.
Tech Stack: Verilog, Xilinx Zynq 7000 FPGA, Vivado Waveform Viewer, GTKwave
- **Home Alarm System:** Breadboard to an accurate sensing system. System included human detection and environment sensing. Unit with a PIR sensor to detect different in heat and another unit for environment sensing that can measure the quality of the air to sense fires. Both alarms had a power system using Mosfet Voltage Regulators to operate using batteries.
Tech Stack: ESP32 Microcontroller, Micropython, Wifi, MQTT, ThingSpeak, IFTTT Widgets, Breadboard Prototyping

ADDITIONAL EXPERIENCE

- **UC Berkeley Underwater Robotics Club - Electrical Team Member** Berkeley, CA
Helped design the electrical components for an autonomous submarine for roboSub. *August 2022 - Present*
- **UC Berkeley IEEE - Technical Operations Team Member** Berkeley, CA
Aided the director of TechOps on tasks like implementing a strategy for a wiki and hackathon. *August 2023 - Present*
- **Currency Exchange International Corp. - Teller**
In-Person *January 2020- February 2021*
- **Inverted Silo Solutions LLC - Manager**
Internet Business *2017 - April 2022 (5 Years)*
 - **Programming:** Built out an e-commerce platform to buy and sell virtual goods from start to finish using Reactjs (Nextjs), Strapi CMS, Authorize Gateway, Stripe, and Heroku. Provided users the ability to buy and sell video game items to our agents and customers in a trustless environment and integrated and streamlined payment methods. Worked with 2-3 partners.