Mark Ghebrial

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Education

UC Riverside   2022-2026
Bachelor of Science in Computer Engineering   *Riverside, CA*
- **Relevant Coursework:** Data Structures & Algorithms, Computer Architecture, Logic Design, Embedded Systems, Operating Systems, Software Validation and Testing, Computer Networks, Circuit Analysis, Databases
- **Club Participation:** Cybersecurity club, Rocketry club.

Projects

FIRST Robotics Competition | *Java, Kotlin*   github.com/Team3309
- Led Team 3309's programming team for 3 years, using Git and GitHub to manage code versioning.
- Wrote sophisticated Java code for 4 robots and designed a Kotlin library to improve code ergonomics.
- Designed and implemented the control code for the team's custom omnidirectional swerve drivetrain, enabling fluid and precise robot movement.
- Served as robot technician in high pressure competition environments, completing pre and post match checklists to ensure maximum robot performance.

Mailroom | *Rust, tokio, sqlite, sea-orm*   github.com/MarkGhebrial/mailroom
- A from-scratch email server, written in Rust. Built because I wanted to learn how email works.
- Leveraged tokio and Rust async/await to efficiently handle simultaneous incoming and outgoing connections.
- Implemented the POP3 protocol, closely referencing published RFCs to ensure maximum compatibility with email clients. Currently working on an SMTP implementation.
- Designed database schema for storing users and user credentials.

Closed Loop Nerf Blaster Controller | *C++, KiCad, Fusion 360*   github.com/MarkGhebrial/blaster_control
- Custom electronics and code for a flywheel based 3D printed Nerf blaster.
- Designed custom PCB for IR reflectivity sensors. Wrote code targeted for Atmel SAMD chips that calculates wheel RPM based on the time between sensor pulses.
- Implemented a feedforward model to accurately represent motor behavior, enhancing PID controller effectiveness and enabling precise motor control from 1,000 to 40,000 RPM.
- Planning to design automatic motor characterization routines for tuning feedforward models.

GitBuddy | *C++, Git, gtest*   github.com/MarkGhebrial/GitBuddy
- A command-line utility for simplifying the Git workflow.
- Employed Scrum methodologies to lead a team of 4 people, delegating and splitting work into 1 week sprints.
- Constructed UML diagrams, navigation diagrams, and technical specifications to guide project development.
- Wrote unit tests using GoogleTest, enabling automatic testing of program behavior.

Technical Skills

Languages: Rust, C++, C, Python, Java, Arduino, Kotlin
Technologies: Git, GitHub, Linux, tokio, Make, Cmake
CAD Programs: KiCad, Onshape, Fusion 360, SolidWorks
Concepts: Object-oriented programming, Model-view-controller model, Operating systems, Memory mapped registers, Encryption & decryption, Assembly code, REST APIs, GPIO, PID Controllers

Work Experience

UC Riverside   January 2025 - March 2025
Grader, Advanced Software Testing and Analysis   *Riverside, CA*
- Graded assignments for UCR's grad level Software Testing and Analysis class, assessing 50+ students on their understanding of relevant research papers.

iPolymer   Summer of 2022
Administrative Assistant   *Irvine, CA*
- Performed various data entry and engineering tasks.
- Wrote a Python script to import data from a temperature probe into a .csv file.
- Designed and 3D printed a custom fixture for characterizing the thermal characteristics of a solenoid.