Charles Sewell Jr.

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Skills

Languages: C++, C, Python, Kotlin, HTML, JS, CSS, Rust, Java
Frameworks/Libraries: React.js, Next.js, Node.js, Flask, Kivy
Technologies: Android SDK, Ruby, Docker, SQLite, PostgreSQL
Concepts: CI/CD, Test-Driven Development, Agile Methodology, Waterfall Methodology, API, Database Normalization

Work Experience

Embedded Software Engineering Specialist
May 2024 – Present

Lynntech, Inc. *College Station, TX*

- A team of engineers were led by using project management techniques to ensure success on known deadlines.
- Conversion from Python to C and C++ were needed for electrical controllability using Arduinos. Further knowledge of Arduino integration was investigated to aid in usage of, later created, device drivers. A defined folder structure was created along with the C and C++ files to accomplish all of the project expectations and requirements.
- Programming and functionality of a newly designed PCB, using MPLAB, was developed due to the necessity within the span of 2 weeks. Various datasheets were interpreted to communicate with on-board integrated circuits (IC). The project was able to meet its deadline and achieve its proposed goals.
- A third-party driver used for electronic communications didn't meet operation expectations. A driver was created for replacement, which added responsiveness on the graphical user interface (GUI), while also being referenced on future projects.
- Debugging during CI/CD workflow, led to huge amounts of expended time. Test-driven development (TDD) was incorporated by using unit testing frameworks on Arduino, C++, C, Python, and Android Studio during development. This reduced the expended time by more than 50%.
- Git as the primary version control system wasn't fully in practice. The usage of Git, along with the benefits, was introduced to multiple engineering groups through meetings, trainings, and a reference document. This helped enhance the company's efficiency in future coding projects.

Software Developer AI Trainer
Mar 2024 – Present

Data Annotation *Remote*

- Correctness of AI generated responses needed validation. Technically advanced test cases were created to evaluate the appropriate outputs. Validation of correct responses were conducted based on code quality, correctness, and format. Constant progression of the model performance was documented after 3 rounds.
- Algorithms and data structures were reviewed and analyzed for appropriateness and accurate descriptions and usage.

Embedded Software Engineering Associate
August 2022 – May 2024

Lynntech, Inc. *College Station, TX*

- Filtering and organization of multiple files with basic Python and JSON parsing needed more efficiency. Python was used with SQLite to help manage and filter data effectively. This increased productivity rate by more than 50%.
- A multitude of objects were unidentifiable through multiple camera feeds. Each object needed association to a database, by being individually tracked and characterized. A python script was created, using OpenCV for object tracking, along with complex algorithms to log all objects and their corresponding data.
- Various issues on a custom PCB and FPGA prevented continuation of testing and manufacturing. The PCB and FPGA went through hardware troubleshooting (re-soldering, signal analysis, power analysis, etc.) and software debugging, which resulted in electrical component replacements and code adjustments. Components that showed continuous unreliability were referenced for replacements in future PCB designs. Code was rewritten, using C, to prevent software failure due to errors and other bugs.
- A new PCB design was needed that had different constraints but similar qualities of previously built PCB boards. Necessary criteria for system functionality was thoroughly assessed, which led to an easier workflow during PCB redesign. The PCB design was further reviewed by other engineers and later fabricated.
- Multiple graphical user interfaces (GUIs) were needed to control various electrical devices. Responsive GUIs were made with UI/UX design in mind, along with a codebase of templates for faster UI generation for future projects.
- Wire harnesses were created by using soldering best practices, wire crimping, and wire validation and testing techniques. Multiple wire harnesses were developed to meet all communication and power needs in the system, while proving to be reliable and well designed.

- An update of build of materials (BOM) was needed, due to the global 2022-2023 integrated circuit (IC) shortage. The reviewed BOM led to the ability to source identical chips and microcontrollers, which were used for newer PCB designs and replacements for reoccurring PCB issues. This knowledge was documented along with the potential single-board computer (SBC) that could be of good use for the company.

Projects

Fitpoof | *Android SDK, Kotlin, SQLite*
- A mobile application designed to keep track of daily macronutrients, past recipes, and weight goals of the user
- UI/UX design along with CI/CD is being used through development.

Universal Bot E-Trader | *React.js, Next.js, Node.js*
- A web application that uses data from stock APIs to monitor and make financial decisions in the stock market

WASPet | *C, C++, 3D Printing, CAD, Andriod SDK*
- An electronic system that combines the features of land and air movability through the use of electronics.
- CAD and 3D printing are used o determine and make the exterior housing.
- Physics and engineering concepts are used to incorporate various real world technologies into this project.

Android Studio Room Database Template | *Android SDK, Kotlin, SQLite* Android-Room-Database-Template
- A templates used to help with room database setup and understanding for code beginners
- MVVM architecture pattern is used upon demonstration of the template.

Automatic Knife Sharpener | *C, C++, MPLab, Altium*
- Led the development of a device that uses multiple sensors and other electronic peripherals to sharpen a knife.
- Created two individual PCBs that were used to control electrical peripherals and interpret UI inputs for controllability.
- Used an Arduino to control and amplify power requirements for motor controllability.

Ol'Ags Organization | *Ruby, Rails, Node.js, PostgreSQL, Docker* github.com/Ol'Ags
- Contributed to a web management service for club members using Google OAuth and database management
- Google OAuth was used to connect personal google accounts to a user's account for account authorization purposes.
- Used PostgresSQL to correlate a user with their own custom personal information and administration rights.

Sprout | *HTML, JS, CSS, Node.js, Apache Netbeans*
- Contributed to a web app that was made to help improve budgeting skills
- Incorporated Twilio, a web API, which sends text messages to phone numbers for account notification and verifications
- The Plaid API was used and integrated to help manage budgeting based on card financial usage.

Occupoty | *HTML, JS, CSS, C++* github.com/HackRice9
- Contributed to a toggle-based system used to determine the status of vacancy for bathroom stalls
- Created an electrical circuit and used an Arduino to interpret locking mechanisms and send information to a web server to broadcast occupancy of the stall prototype.

Education

Texas A&M University May 2022
Bachelor of Science in Computer Engineering