ALEX BIGGS

Asheville, NC | (828) 275-9732 | afbiggs73@gmail.com | Linkedin.com/in/alex-biggs-2a8a0194 | github.com/afbiggs |
https://alexbiggs-portfolio.vercel.app/

Embedded Full Stack Engineer | Software Developer

Engineering professional with expertise in developing high-quality APIs, scalable web services, and secure communication protocols for embedded systems and IoT platforms. Designed and deployed full-stack applications, optimized real-time data processing, and integrated hardware peripherals with modern software solutions. Ability to create fully functioning embedded systems from the front-end UI to the backend and the Server side. Maintained smooth development lifecycles and enhanced system reliability, and efficient troubleshooting. Passionate about improving deployment processes and driving technological advancements.

- Designed and ordered custom PCB circuits for embedded systems.

Core Competencies: Embedded Systems Development | Full-Stack Web Development | Secure Communication Protocols | Real-Time Data Processing | API Design & Development | Web Services | IoT System Architecture | Backend & Frontend Development Cross-Functional Collaborations | Agile Development | Repository Management | Team Leadership | Technical Troubleshooting & Debugging | Test Case Development | Quality Assurance & Control | Requirement Analysis | Solution Design

KEY HIGHLIGHTS

- Increased client revenue by **14%** per month, developing a retrofit control system to restore machine functionality.
- Improved deployment and reduced downtime by implementing OTA update capabilities for real-time system enhancements.
- Architected full-stack applications and restored non-functional machines to full operation, integrating React UIs with Node.js, Python, and C++ backend.

PROFESSIONAL EXPERIENCE

Spark Robotic | Mars Hill, NC | July 2024 – Present
Software Developer

Engineered secure protocols between hardware peripherals and servers to optimize real-time data communication and scalability. Developed secure communication protocols for IoT platforms to enhance system reliability and data integrity. Organized repositories, maintained version control, and documented processes to increase development efficiency and maintainability.

- Enabled seamless and secure interaction with embedded hardware by configuring Raspberry Pi systems to host React applications and backend servers.
- Accelerated project timelines and maintained troubleshooting efficiency while defining technical requirements and resolving system issues in collaboration with hardware engineers.
- Designed backend architectures, using Node.js to refine real-time data processing and analysis.
- Strengthened system performance via advanced troubleshooting methodologies to diagnose and resolve inefficiencies.

CNC Fiber Laser Project (In Progress)
- Lead Developer and Project Manager for a cutting-edge CNC machine with limited market alternatives.
- Oversee project management, role delegation, and cross-functional team coordination.
- Conduct in-depth market research and competitive analysis to identify industry opportunities.
- Develop comprehensive documentation, schematics, and technical specifications.
- Collaborate with the mechanical design team to refine physical hardware and system integration.
- Manage product testing, performance validation, and quality assurance processes.

- Projected to generate **$500K–$750K** in revenue in the first year, with a scalable growth model.

ADDITIONAL EXPERIENCE

Farm Burger | Asheville, NC | Mar 2019 – July 2024
Assistant General Manager
- Redesigned the hiring process for management positions by developing a comprehensive hiring guideline, including structured interview questions and answers, to ensure thorough candidate evaluation and selection of top talent.
- Led daily operations of a high-volume restaurant, overseeing a team of 3 to 8 staff members. .

TECHNICAL SKILLS

- **Frontend Development:** HTML5 | CSS | JQuery | JavaScript | React | Restful APIs | Bootstrap | Embedded Systems UI's
- **Web Backend & Databases:** MySQL | Sequelize | MongoDB | GraphQL | Express | Node JS | Websockets/SocketIO
- **Scripting & Programming:** C++ | Python (Basic) | Bash/PowerShell | Arduino IDE | PlatformIO | Embedded C++
- **Embedded Systems & Hardware:** ESP32 | ESP8266 | Arduino-based Platforms | STM32 Microcontrollers | Raspberry Pi | RTOS | Circuit Design & Debugging | Sensors, Encoders & Peripherals (I2C, SPI, UART, GPIO) | Microcontroller Programming | Hardware Module Interfacing | Server & Frontend UI Integration
- **Cybersecurity & Networking:** Kali Linux | Virtual Machines | Nmap | Wireshark | Metasploit | Penetration Testing | Ethical Hacking|Firewalls| VPN | SSH | Tailscale | IDS/IPS | Web-Proxies | SNP | Network Segmentation | Secure App Development
- **OS & System Administration:** Windows | Linux | MacOS | Linux Boot Scripts & System Admin Setups (Embedded)
- Linux/Debian System Optimization | System Boot/Configuration Scripts | Troubleshooting | Docker

KEY PROJECTS

Gauer Retrot Project
- Designed and developed a modern control interface for an outdated metal shearing machine to ensure seamless operation and integration with legacy hardware.
- Built a React/JavaScript front-end UI and a Node.js backend, enhancing system responsiveness and user experience.
- Implemented C++ control software on an ESP32 to manage user inputs and control signals, improving precision and processing efficiency.

Self-Built Tennis Ball Machine & Other Electronic Projects | github.com/aiggs/Tennis-Ball-Machine
- Engineered various innovative projects, including a local network server for wireless 3D printer control, guitar effects pedals, and ethical hacking/network devices using ESP modules and programmable boards.
- Developed a custom tennis ball feeding machine from scratch, integrating advanced technical elements to rival top-tier market models; currently **75%** complete with an in-progress user control app.

OOP Team Profile Generator | github.com/aiggs/OOP-Team-Profile-Generator.git
- Developed a command-line application, using Node.js to collect user input and dynamically generate an HTML file displaying engineering team information.
- Automated team data visualization via an interactive input system that streamlines the creation of structured HTML reports.

MySQL Employee Tracker | github.com/aiggs/mysql-employee-tracker.git
- Designed a Content Management System (CMS) for workplace employee tracking using MySQL for retrieving employee data.
- Developed a command-line interface application integrating Node.js and Inquirer.js to facilitate database management.
- Optimized employee tracking across departments by implementing structured queries for filtering and viewing data.

EDUCATION & CERTIFICATION

Full Stack Flex Boot camp | Certificate of Completion: UNC-Chapel Hill | Sep 2024

Bachelor of Business Administration & Management: Appalachian State University | Dec 2018