Alfred Jijo

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I am a student at Liverpool John Moores University studying Software Engineering with an interest in systems programming, network security, and hardware integration. I enjoy building real-time applications, managing physical hardware setups, and communicating complex technical architectures to diverse teams.

Skills

- Experience with cross-functional leadership, acting as the co-lead for an 18-person engineering team and managing Agile workflows.
- Experience with system integration and hardware, managing Raspberry Pi and Pi Camera modules for live data demonstrations.
- Experience in writing bare-metal C/C++ for low-level performance optimization, custom memory allocators, and real-time systems.
- Experience with rigorous Software Verification, writing custom testing harnesses, and configuring CMake build pipelines.
- Experience in network protocols and real-time data streaming through building client-server web applications.

Projects & Experience

reldb - Custom Virtual Machine & Compiler
https://gitlab.com/Alfred-Jijo/reldb
Engineered a lightweight database engine and bytecode virtual machine in pure C. Architected a custom Read-Eval-Print Loop (REPL) using dynamic input buffers, a lexical compiler frontend to parse statements, and a VM execution backend. Managed the entire build and documentation pipeline using CMake and Doxygen.

WinTer - Custom Terminal Emulator
https://gitlab.com/Alfred-Jijo/winter
Engineered a Windows Terminal Emulator from scratch using C11. Architected a custom OS interface layer to manage shell processes and inter-process communication using anonymous memory pipes and the ConPTY API. Designed a custom region-based memory allocator (Arena) using direct OS system calls. Configured a complete CMake build pipeline and developed a unit testing harness to rigorously verify memory safety.

cbase - C Utility & Memory Foundation
https://gitlab.com/Alfred-Jijo/cbase
Developed a foundational C library providing custom, high-performance memory allocators (Arena and General Purpose) and OS-level abstractions. Engineered a modular architecture completely bypassing the standard library heap, integrating custom logging utilities and a bespoke unit testing harness for rigorous software verification and continuous integration via CMake.

Synthethsia - Embedded Audio Analyzer
https://gitlab.com/Alfred-Jijo/synthethsia
Engineered a high-performance C++ real-time audio analysis engine tailored for resource-constrained environments using the PlatformIO ecosystem. Implemented fast digital signal processing (DSP) to achieve strict sub-50ms latency constraints. Utilized Agile methodologies and GitLab CI workflows for rapid iterative testing, while architecting a modular hardware abstraction layer to ensure robust code portability.

Project Hyperion (Hardware Engineer & Product Owner)
An automated sky monitoring system developed by an 18-person team. Engineered the embedded GNU/Linux hardware interface using Raspberry Pi to successfully manage live camera capture and automated timelapse generation. After delivering the core physical requirements, I transitioned into the Product Owner role, utilizing Agile methodologies to guide the software team and manage stakeholder requirements.

dtime.c - Native OS Utility
https://gitlab.com/Alfred-Jijo/dtime
Developed a native Discord Timestamp Generator in pure C with zero external dependencies, interacting directly with the OS via the Win32 API. Implemented custom command-line argument parsing for string formatting and manual heap memory management for clipboard operations. Demonstrates a strong grasp of OS-level system calls and lightweight toolmaking.

HackNotts '25 (ASMR-Lang)
https://gitlab.com/Alfred-Jijo/asmr-compiler
Co-designed and delivered a functional esoteric programming language in a 24-hour Hackathon utilizing rapid Agile sprint methodologies. Mentored teammates on feature integration using Git, implemented lexical analysis and bytecode generation under strict time constraints, and successfully presented a live technical demonstration of the system to a panel of judges.

go-chat
https://gitlab.com/Alfred-Jijo/go-chat
A real-time chat application developed to experiment with client-server networking. Implemented WebSockets in Go and JavaScript to allow persistent, low-latency communication between users, demonstrating practical knowledge of network data streaming, secure message delivery, and asynchronous UI state management.

Work Experience

Goldmine Restaurant (Customer Service)
Demonstrated reliability and effective time management by balancing duties during high-pressure environments. Developed strong interpersonal and conflict resolution skills by ensuring high levels of customer satisfaction and handling service queries diplomatically.

Education

BSc (Hons) Software Engineering
Liverpool John Moores University: Expected 2027
Key Modules: Data Structures & Algorithms, Software Engineering Principles (Agile/Scrum), Database Systems, Computer Networks.

A Level
Cronton Sixth Form College: 2022-2024
Computer Science, Mathematics, Physics.