Role Fit — Shure Senior Embedded Software Engineer (mapping)

Context: This page maps the Shure job requirements to specific project evidence in this portfolio. Each bullet below points to one or more projects and a one-line explanation of how the project demonstrates the skill.

- **Design, develop and test embedded software and associated components for audio products (C/C++):**
- Real-Time Audio Separation — Teensy firmware, I2S/UART C/C++ code, Raspberry Pi processing and multithreaded Python demos demonstrating low-latency embedded audio capture and processing.
- Stratum Synthesizer — assembly-level audio engine and drivers showing deep knowledge of audio signal path and constraints.
- **Hardware drivers, embedded software applications, audio and control networking (C/C++):**
- Stratum Synthesizer — speaker and SD drivers, low-level peripheral control.
- Zumo Shield Robot — STM32 PWM, timers, UART and GPIO; illustrates driver usage and hardware control.
- **Real-time, multitasking, RTOS concepts and debugging (Embedded Linux/FreeRTOS/etc):**
- Real-Time Audio Separation — real-time constraints, multicore/multithreaded processing and synchronization.
- Zumo Shield Robot — real-time control loop design and hardware timing considerations (timers, interrupts, PWM).
- **Networking & protocols (UART, I2S, possibility to work with Ethernet/TCP/UDP/Wi-Fi):**
- Real-Time Audio Separation — I2S audio capture and UART streaming; demonstrates protocol-level understanding and embedded networking concepts.
- **Software architecture, design, and testing (reviews, unit/integration tests):**
- All projects include design notes and reports; the portfolio includes a test-oriented project (Toyota Auto-Validation) and unit tests in other repos (e.g., the archived Glasgow repo had tests). I prioritize clear documentation and testability.
- **Hardware debugging and release processes:**
- Zumo Shield Robot and Stratum Synthesizer show hardware bring-up, telemetry, and iterative debugging workflows; Toyota demo shows validation and reporting practices.
- **Version control and documentation:**
- Full repositories and README/USAGE/OVERVIEW docs are included with each project; this portfolio itself is version-controlled and deploy-ready.
