Viju Sanjai

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Education

Vellore Institute of Technology — Chennai, TN
Bachelor of Technology in Electronics and Communication (GPA: 8.16) — *Aug 2023 – Present*

Technical Skills

Languages: Python, JavaScript/TypeScript, Java, C/C++, Rust, C#, SQL, HTML/CSS
Frameworks: React, Next.js, Express, Flask, .NET, Tauri, WebGPU, Hono
Developer Tools: Git, Docker, AWS, Cloudflare, Supabase, VS Code, Linux/GDB, Figma
Concepts/Areas: Full-Stack Development, Systems Architecture, Kernel Development, Reverse Engineering

Experience

Lagoon Technologies — Chennai, TN
Software Development Intern — *Sep 2024 – Feb 2025*

- Engineered and optimized internal enterprise software tools utilizing **C# and the .NET framework** within an Agile environment.
- Conducted exploratory and architectural analysis of legacy systems, identifying structural bottlenecks to improve maintainability and accelerate release cycles.
- Collaborated in daily SDLC cross-functional discussions to align software architecture with enterprise requirements.

Research Experience

Adaptive Quantum-Chaotic Steganography (Ongoing) | *PyTorch, Qiskit, RL, Python* — Jan 2025 – Present

- Developing an **AI-assisted BB84 steganography protocol** integrating Bernstein–Vazirani circuits and an **Improved Logistic Map (ILM)** for chaotic diffusion on BB84-derived keys.
- Training a QBER classifier (1D CNN + attention / Transformer) that reaches **AUROC 0.97** for detecting partial intercept-and-resend attacks on noisy IBM-style backends.
- Using a **Deep Q-Learning** agent to tune ILM parameters (μ, γ), targeting higher NPCR/UACI with $\approx 1.5\%$ qubit overhead, and ≈ 0.4 **ms** AI inference per epoch in current experiments.

Technical Projects

FFmpeg WebGPU Integration | *Rust, WebGPU, WGSL, Vulkan, FFmpeg* — Dec 2024 – Present

- Developing a custom **WebGPU hwcontext** for FFmpeg to enable efficient GPU buffer management and zero-copy hardware-accelerated video pipelines.
- Porting existing **Vulkan**-based video processing filters to WebGPU, rewriting complex compute shaders into **WGSL** for broad cross-platform support.
- Leveraging **Rust** and the WGPU ecosystem to safely interface with FFmpeg's C-based architecture, optimizing memory ownership across CPU and GPU domains.

Firmware Signer & Flasher | *Rust, CLAP, Tauri, C/C++* — Jun 2024 – Present

- Built a Rust-based utility for cryptographically signing and deploying firmware binaries to embedded targets using Ed25519.
- Implemented custom **Intel HEX** and **.bin** parsers for bit-perfect signature injection, verified via public-key checks.
- Developed a desktop interface with **Tauri**, keeping memory usage low while handling hardware I/O.

Leadership & Community

- **Linux Club:** Solved system-level and cryptographic challenges in a campus-wide **Capture The Flag (CTF)** competition.
- **OSPC Research Lead:** Mentored 50+ students on **Git**, collaborative development, and kernel-level basics at the Open Source Programming Club.