

# Nithilan Rameshkumar

Electronic Systems & CS Dual Degree | Systems & Infrastructure Software Engineer

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## Education

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**Indian Institute of Technology Madras**, B.S. in Electronic Systems May 2024 – Aug 2028

- Dual degree + B.Tech CS; coursework: Digital System Design, Embedded, Signals. CGPA: 8.3/10.

**Amrita Vishwa Vidyapeetham**, B.Tech in Computer Science and Engineering July 2024 – Sept 2028

- Coursework: DSA, OS, Computer Networks, DBMS; CGPA: **9.0/10** (Top Scholarship Category).

## Experience

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**Interns Lead, Honeywell** – Bengaluru, KA Dec 2025 – Jan 2026

- Led 3 interns onsite to ship an NLP tool migrating legacy **IBM DOORS NG** requirements to IEEE-standard SRS via a strictly onsite local LLM, with dual FastAPI + Tkinter interfaces.
- Co-authored a review article and conference paper on applied NLP and embedding models for requirements modernization at Honeywell, working with academic and proprietary datasets.

**Embedded Security Researcher, Team bi0s** – Bengaluru, KA Jan 2025 – Present

- Binary analysis on **ARM and x86** for one of India's top ranked CTF teams; **GDB** memory forensics tracing heap corruption, race conditions, and stack overflows in compiled binaries.

## Projects

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**goboxd** 📄: **Hardened Code Execution Engine** May 2026 – July 2026

- Solo-built **goboxd** in **Go**, a hardened engine that safely runs untrusted code across 17 languages inside Google **nsjail** namespace sandboxes with **seccomp-bpf** syscall filtering.
- Closed **11 vulnerability classes** (path traversal, injection, resource exhaustion) with explicit mitigations and tests, backed by **450+ test fixtures** and 52 penetration tests.

**zapiska** 📄: **Self-Hosted Comment Engine in Rust** June 2026 – Present

- Architected **zapiska**, a production-grade self-hosted comment engine and W3C Webmention receiver in **Rust** (Axum/Tokio), replacing proprietary platforms with one ~10MB binary on Rust + SQLite.
- In production at nithitsuki.com at **100k+ monthly requests** SSRF protection at every redirect hop with DNS re-resolution, timing-safe admin auth, and a six-layer anti-spam pipeline.

**Real-Time Polyphonic Synthesizer Firmware** July 2025 – Sept 2025

- Polyphonic audio engine on the **ESP32** driving an 8-bit DAC via DMA for CPU-free sample streaming, with **FreeRTOS** task scheduling and a lock-free ring buffer at sub-10ms latency.

**Bare-Metal K3s Cluster & Service Mesh** Oct 2024 – Present

- **K3s** across **ARM and x86** with **Cilium (eBPF)** kernel networking, **Cloudflare Tunnels** for multi-domain ingress, Pi-hole DNS sinkhole, and 15+ production services including Affine and Linkding.
- Automated **Ansible** provisioning across the fleet; redundant **Synthing** replication and backup; observability via **Uptime Kuma**, **Netdata**, **Scrutiny** SMART monitoring, and custom alerting.

## Technical Skills

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**Languages:** C, C++, Rust, Go, Java, TypeScript, Python, ARM & x86 Assembly, Bash.

**Systems & Linux:** nsjail, seccomp-bpf, cgroups, K3s, Docker, Cilium/eBPF, Ansible, GitHub Actions, GDB.

**Frameworks:** Spring Boot, Next.js, PostgreSQL, SQLite, Axum, FreeRTOS, ESP-IDF, REST/OpenAPI.

## Additional Information

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**Languages:** English (Native), Tamil (Bilingual), Hindi (Limited Working), Kannada (Limited).

President of [atlasdev.club](#) 📄 (international systems community) and [amrita.town](#) 📄 hosted **bi0s** CTFs, delivered campus tech talks to juniors and seniors, and marketed **Dastaan** national fest.

Built pipeline for **Dastaan** Certificates (thousands emailed); 3-time Hackathon Winner; mentor and judge at Byte Battle; hosts [social.nithitsuki.com](#) 📄, [links.atlasdev.club](#) 📄 and many more