Muhammad Nuh

Fullstack Developer / Automation, Cloud & Embedded Systems

Petaling Jaya, Malaysia (UTC+8) +60 11-1154 3759 ikanlemas0@gmail.com
github.com/hexrogue hexrogue.github.io/research

PROFILE

Fullstack developer with 6 years in IT and 1 year in electronics. I build automation, internal tools, and web applications, then go down the stack into Linux, cloud, networks, and firmware when the problem asks for it. Currently building APEL.A, the first APEL.A admissions system in Malaysia, at SKC Education Global. I also maintain a public research notebook on edge computing and simulation.

RESEARCH TRAINING

Adaptive Computation Offloading for Edge-Assisted IoT Devices — INDEPENDENT / 2026 - PRESENT

Python, NumPy, Matplotlib, discrete-event simulation, Monte Carlo, queueing

- Built a reproducible simulator comparing local-only, always-offload, and a deadline/energy-aware policy across 27 load points with 20 replications each.
- At 0.8 tasks/device/s, the adaptive policy cut deadline misses from 45.1% to 10.3% and used 62.5% less energy per task than local-only; documented the assumptions and failure modes.
- Published a journal-style working paper, a four-year thesis plan, the simulation code, CSV data, and figures at hexrogue.github.io/research.

Research interests: edge computing, distributed systems, network measurement, cloud reliability, applied simulation.

SELECTED IMPACT

- Delivered the first APEL.A admissions system in Malaysia, replacing forms, email, and spreadsheets with one audited workflow.
- Reduced frontend bundle size by 40% and improved Lighthouse scores on the company site rebuild.
- Replaced third-party WhatsApp SaaS with a self-hosted Go gateway supporting messaging, VoIP, and real-time events.

PROFESSIONAL EXPERIENCE

Fullstack Developer / SKC Education Global — OCT 2025 - PRESENT

- Built APEL.A, the first APEL.A admissions system in Malaysia: a 23-step workflow engine with audit trails, MediaPipe exam proctoring, WebRTC live monitoring, nine-role access control, portfolio PDF export, and FPX payments.
- Built and maintain the admissions CRM: lead pipeline, role-based access, study-plan PDF generation, WhatsApp automation, and commission tracking.
- Built SKC Central, the internal operations platform for finance, scheduling, teaching records, and admin.
- Developed a Go-based WhatsApp gateway with VoIP support, deployed with Docker.
- Reduced frontend bundle size by 40% and improved Lighthouse scores.

Freelance Developer / Self-employed — 2025

- Built small business sites and internal tools for local clients.
- Set up lead follow-up automation and WhatsApp integrations.

Self-directed IT and Development — 2020 - 2025

- Started with an Android phone and no laptop; learned Linux, networking, programming, security, and a homelab by building.
- Six years of IT experience and one year of electronics.

SELECTED PROJECTS

APEL.A Admissions Portal — PRIVATE CLIENT / 2026 - PRESENT

Next.js, TypeScript, PostgreSQL, Drizzle, Better Auth, MediaPipe, WebRTC, Puppeteer, ToyyibPay · 101 routes, 45 tables

- **Workflow engine:** 23 steps across application, payment, aptitude, portfolio, interview, and completion, with validated transitions and an audit record for every change.
- **Exam proctoring:** MediaPipe face and object detection in the browser (no face, multiple faces, looking away, phone, book), plus WebRTC live monitoring and replay. Signals are evidence, not auto-fail.
- **Access and payments:** nine roles with per-user overrides that only narrow access, server-side checks on every route, ToyyibPay FPX with manual verification fallback, and PDF receipts.
- **Documents:** structured portfolio builder with evidence, referees, and signature; server-rendered official PDF with merged evidence and image compression.

Admissions CRM — PRIVATE CLIENT / 2025 - PRESENT

Next.js, TypeScript, Drizzle, PostgreSQL, Puppeteer

Admissions platform replacing spreadsheets, email, and paper. Lead pipeline, role-based access, study-plan PDF generation, WhatsApp automation, and commission tracking.

WhatsAPI

PRIVATE / 2025 - PRESENT

`Go, whatsmeow, Docker, WebSocket`

Self-hosted WhatsApp gateway with messaging, VoIP, real-time events, QR and pairing auth, and SQLite/PostgreSQL support. Powers CRM messaging and calls without third-party SaaS.

SKC Central

PRIVATE CLIENT / 2026 - PRESENT

`Next.js, TypeScript, PostgreSQL, Drizzle, Better Auth, TanStack Table, Recharts`

Internal operations platform for a private education group: finance, commissions, scheduling, clash detection, teaching records, audit logs, and Excel/UROX/Canvas imports.

MORE PROJECTS

CareerGap

PRIVATE / 2026

`Next.js, TypeScript, Drizzle, PostgreSQL, ESCO API`

Deterministic skill-gap analyzer against ESCO occupations: readiness score, critical gaps, and ranked learning recommendations. No LLM.

Xray Workers

OPEN SOURCE / 2026

`TypeScript, Cloudflare Workers, D1`

Serverless VLESS proxy with D1 user management; edge-deployed with no VPS to patch. github.com/hexrogue/xray-worker

PrayerTime

OPEN SOURCE / 2026

`Go, Bubble Tea, SQLite`

Offline terminal prayer time calculator built from spherical trigonometry; single binary, no APIs. github.com/hexrogue/PrayerTime

ESP32 Recon Rig

LAB PROJECT / 2026

`ESP32, ESP-IDF, C, 802.11, BLE`

Five-dollar board turned into a wifi and BLE recon dashboard; custom driver work, serial console, and a public build guide.

More projects and write-ups at hexrogue.github.io/projects.

TECHNICAL SKILLS

Languages	Go, TypeScript, JavaScript, Python, PHP, Bash, SQL, C
Frontend	Next.js, React, Tailwind CSS, Hugo, TanStack Table/Query
Backend	Node.js, Express, PostgreSQL, SQLite, MySQL, Redis, Drizzle, Prisma, Better Auth
Cloud & Infra	AWS (S3, Lambda, EC2, CloudFront), Google Cloud, Kubernetes, Docker, Cloudflare Workers/D1/KV, Vercel, Nginx, Caddy
Automation	Puppeteer, pdf-lib, pagedjs, ExcelJS, Nodemailer, MediaPipe, WebRTC, ToyyibPay, WhatsApp APIs
Research	Python, NumPy, Matplotlib, Monte Carlo, discrete-event simulation, queueing, data analysis
Networking	802.11, BLE, sub-GHz, OpenWrt, VLANs, WireGuard, Wireshark
Security	Burp Suite, Ghidra, radare2, Frida, GDB, Nmap, Metasploit
Hardware	ESP32, ESP-IDF, C, sensors, serial, electronics, hardware debugging
Systems	Arch Linux, Ubuntu, Debian, Proxmox, Git, CI/CD, Neovim, Tmux
Practices	Role-based access, audit trails, workflow engines, test harnesses, data migration, technical writing

EDUCATION

BSc Software Engineering / Universiti Tun Abdul Razak

MAR 2026 - PRESENT

3.8 CGPA last semester. Studying while working full-time.

WRITING

56 write-ups on software, networks, hardware, security, and career at hexrogue.github.io/blog. Topics include 802.11, WPA2/WPA3, BLE, sub-GHz, ESP32, Linux, reverse engineering, and web security. Also a public research notebook at hexrogue.github.io/research with a journal-style working paper and thesis plan.

Selected: “WPA3 SAE, without the fairy tales” / “The 2.4 GHz food fight” / “Building the ESP32 recon rig for real.”

LANGUAGES

Malay (native), English (professional).