

Abhinav

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Portfolio:

Education

B.Tech in Computer Science and Systems Engineering | 2024 – 2028

- **Relevant Coursework:** Data Structures (C++), Object-Oriented Programming (Java), Computer Architecture.
- **Technical Focus:** Systems Programming, Backend Infrastructure, and Linux Environments.

Skills

- **Languages:** C++, Python, Go, JavaScript, Java, SQL, Bash.
- **Systems:** ESP8266, LittleFS, I2C, Shell Scripting, Task Scheduling, Kernel/OS Basics.
- **Backend/DevOps:** FastAPI, Flask, PostgreSQL, Docker, Nginx, Git, SQLite.
- **Libraries:** React, Pygame, Raylib, GDB, Linux CLI.

Projects

Microcontroller OS Environment | [repo link](#)

- Developed a C++ environment for ESP8266 featuring a custom bootloader and modular command registry.
- Integrated **LittleFS** for persistent storage, implementing shell utilities (`ls`, `cat`, `rm`, `touch`) and NTP time sync.
- Managed hardware telemetry and network status via I2C OLED display and Wi-Fi abstraction layers.

ELIN: Stack-Based Language & VM | [repo linkn](#)

- Engineered a toy language with a **Python compiler** targeting a custom `.OUTZ` bytecode format.
- Built a C++ **Virtual Machine** from scratch to handle stack-based arithmetic, memory mapping, and control flow.
- Designed the runtime to operate within resource-constrained environments as a lightweight scripting engine.

PMG: Poor Man's Git (VCS) | [repo link](#)

- Architected a **VCS CLI in Go** utilizing SQLite for local state tracking and a linear commit history model.
- Developed a **FastAPI/PostgreSQL** backend for repo synchronization and a **React** dashboard for file browsing.
- Created a desktop **Web IDE** (Python/Pywebview) featuring an integrated terminal and file system management.

VN-Core: Narrative Engine | [repo link](#)

- Built a Python/Pygame engine powered by a **Custom DSL** for narrative scripting and branching story logic.
- Developed a regex-based parser and state-driven architecture for persistent variables and scene navigation.
- Implemented a modular asset pipeline for alpha-blended transitions and multi-channel audio orchestration.

Open Source & Experience

- **Linux Daily Driver:** 6 years experience in CLI-driven system management, automation, and kernel configuration.
- **GSoC Candidate:** Focused on contributing to systems tools, embedded software, or compiler infrastructure.
- **Methodology:** Strong emphasis on "from-scratch" implementation to understand low-level system internals.