Siddharth Karanam

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EDUCATION

Vellore Institute of Technology   August 2023 - May 2027

Bachelor of Technology in Computer Science and Engineering   *CGPA: 8.60*

ACHIEVEMENTS

Pentathon 2024 Finalists | *NCIIPC-AICTE Cybersecurity Competition*
- Ranked **33rd** in Round 1 and **5th** in Round 2, a cybersecurity contest by **NCIIPC-AICTE**.

EXPERIENCE

Postgres Proxy Server | *Rust Developer* | *Freelance*   October 2024 – December 2024
- Designed and improved **SQL query transformation** using **AST manipulation**, reducing query processing overhead by **50%**.
- Enhanced **SQL parsing** with **sqlparser-rs**, enabling precise query validation and **invalid column rejection**, improving accuracy by **40%**.
- Refined **information schema retrieval**, cutting metadata lookup time by **50%** (under **100ms**).
- Strengthened **logging and test coverage**, boosting reliability by **45%** and reducing debugging time by **30%**.

Zvia Tech | *Front-end developer* | *Freelance*   September 2024 – December 2024
- Initiated the front-end for an **Enterprise Resource Planning (ERP)** platform using Next.js with sales
- Built **10+ CRUD** forms with custom query validation, connecting **20+ Axios** client requests to the backend.
- Incorporated **Storybook** for component testing, enhancing reusability and debugging efficiency by **50%**.

PROJECTS

LiteFM | *C, ncurses, libarchive, yaml-cpp*   July 2024
- Designed a **lightweight curses-based file manager** with Vim keybindings, enhanced for **minimal CPU and memory usage**
- Integrated **libarchive** for rapid file compression/extraction, cutting archive handling time by **30%**
- Created a modular **syntax highlighting system (SYNHASH)** with YAML-based configuration, reducing parsing time by **25%**

rAVen | *C, raylib, libavformat, FFT, PipeWire (planned)*   September 2024
- Developed a **real-time audio visualizer** using raylib, achieving **60+ FPS** on mid-range hardware
- Devised a **custom Fast Fourier Transform (FFT)**, reducing processing latency by **35%**
- Integrated **libavformat** for metadata extraction, improving parsing speed by **20%**
- Support for **PipeWire, ALSA, and PulseAudio** to enhance compatibility across Linux audio backends

Anvilock | *C, libwayland, libpam, libwayland-egl, glesv2*   October 2024
- Developed a **secure session locker** for Wayland compositors with **fast authentication** via PAM
- Implemented **EGL-based rendering**, reducing frame rendering overhead by **30%**
- Supported **ext-session-lock-v1** protocol for seamless integration with **Sway, Hyprland, and Wayfire**
- Built a **highly configurable TOML-based settings system**, enabling rapid customization

inLimbo | *C++, FTXUI, TagLib, GLib, DBus, CMake, cereal*   January 2025
- Created a **high-performance TUI music player**, supporting **5+ audio formats** with minimal CPU usage
- Streamlined **metadata parsing with TagLib**, adding support for multiple audio formats
- Built an **efficient song map**, enabling **instant metadata navigation** with serialized load time optimized by atleast **150%**
- Integrated **DBus** for seamless system-wide audio control and device switching
- Implemented a **CLI interface** with metadata printing, cache management, and debugging tools

TECHNICAL SKILLS

Programming Languages: C, C++, Rust, Dart, Python, Bash, Java, CSS, HTML, JavaScript, GLSL
Frameworks & Libraries: FFmpeg libraries, LLVM, Flutter, Firebase, ReactJS, GoogleTest, ncurses, libwayland, PipeWire, SDL, Raylib, OpenGL, Freetype, xkbcommon, PAM, GLib, FastAPI, Boost C++
Databases: MySQL, PostgreSQL
Development Tools: Git, GitHub, Shell Scripting, Neovim, VS Code, Linux, Clang, CMake, Meson, Node.js, Docker