Akshit Gaur

Systems Engineer · Kernel Hacker · Rust Developer

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EDUCATION

Jawaharlal Nehru University (JNU) New Delhi, India
Bachelor of Technology in Computer Science and Engineering *2023 -- 2027*

- Current CGPA: 8.24 / 10.0
- Coursework: Operating Systems, Compiler Design, Machine Learning, Data Structures & Algorithms, RISC-V Arch.

EXPERIENCE & OPEN SOURCE

Redox OS (Rust Microkernel) Remote
Core Contributor / Incoming RSoC *Jan 2026 -- Present*

- Prototyping a User-Space Scheduler to decouple scheduling logic from kernel space, aligning with microkernel principles.
- Implementing the EEVDF (Earliest Eligible Virtual Deadline First) scheduling algorithm in Rust to replace legacy CFS.
- Porting standard benchmarking suites to Redox to establish performance baselines.

Rust Compiler (rust-lang/rust) Open Source
Contributor (T-compiler) *Nov 2025*

- Identified and resolved a metadata-loading failure in the `run-make` test infrastructure.
- Collaborated with compiler maintainers to implement a robust resolution strategy for `.rmeta` files in bootstrap.

Foundational ONNX Ops **2025**
Rust, Machine Learning, Burn

- Implemented mathematical operators (GEMM, Softmax, OneHot) for the Burn Deep Learning library in Rust.
- Optimized tensor operations for memory safety and zero-cost abstractions using Rust's ownership model.

PROJECTS

xv6-RISCV Kernel Analysis **Ongoing**
C, RISC-V Assembly, Operating Systems

- Conducting a deep-dive analysis of the MIT xv6 kernel; authored technical guides on `himwant.org`.
- Analyzed kernel synchronization (Spinlocks) and atomic instructions (AMOSWAP) on RISC-V hardware.
- Documented the Sv39 paging system and the multicore boot sequence from `entry.S` to `main.c`.

Time-Machine RNN **2024**
Python, PyTorch, LSTM

- Trained a character-level language model on H.G. Wells' *The Time Machine* using raw PyTorch.
- implemented backpropagation through time (BPTT) and analyzed gradient flow in recurrent networks.

TECHNICAL SKILLS

Languages: Rust, C, Python, RISC-V Assembly, SQL, Bash
Systems: Linux (NixOS/Guix), xv6, Git, Emacs, GDB, Docker
Libraries: PyTorch, NumPy, Burn (Rust), Tokio, Axum

ACHIEVEMENTS

- **Event Anchoring:** Hosted major university cultural events and Devbhumi Society ceremonies (Audience: 500+).
- **NCC Cadet:** Earned medals for Best Public Speaker and Master of Ceremonies (2019).
- **Techspardha Winner:** Secured 2nd Prize in 'Grey Matter' technical competition at NIT Kurukshetra.