Aman Pathak

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Education

Kalinga Institute of Industrial Technology CGPA: 8.8
Bachelor of Technology in Computer Science *2022 – 2026*

Experience

Undergraduate Research May. 2025 - Aug. 2025
BITS Pilani

- Assisted in research on Hardware Security, Cryptography, RISCV, and Malware Analysis through High Dimensional Machine Learning.

Undergraduate Research Feb. 2023 - Aug. 2024
KIIT University

- Studied RF communication in THz and GHz domain. Designed Microstrip Patch Antennas for Ku and X band in CST Studio. Developed CST Studio ASCII data preprocessor (GUI Based) in Python. Studied Deep Learning techniques for interpretation of Antenna Datasets.

Projects

Vajrip | *C* 2025

- Built a complete userspace TCP/IP stack (Ethernet, ARP, IP, ICMP, UDP, TCP) fully in C.
- Implemented BSD-style socket APIs and TAP-based virtual NIC integration.
- Added core TCP features including handshake, sliding window, and retransmission logic.

Advx | *Python, PyTorch* 2024

- Implemented and evaluated multiple adversarial attacks (FGSM, PGD, CW, DeepFool) on CNN models trained on MNIST.
- Developed multi-attack adversarial training pipelines and achieved significant robustness gains (˜98% accuracy under all attacks on MNIST dataset).
- Designed systematic evaluation protocols to avoid data leakage and benchmark clean vs. adversarial performance.

CHIP-8 Emulator | *C, SDL2* 2024

- Developed a CHIP-8 emulator to replicate the functionality of the classic virtual machine architecture.
- Implemented core components, including an opcode decoder, memory management, and a CPU emulator alongside SDL2 for rendering the 64x32 display and handling input for games.

Luma Lang | *Java* 2024

- A programming language with support for both interpreted and compiled execution models.
- Implemented key features like a lexer, parser, and intermediate representation for efficient execution.

RV32I RISC-V Single-Bus Emulator | *Java* 2024

- Developed an monolithic emulator for the RV32I instruction set architecture with a single-bus design.
- Implemented instruction fetch, decode, execute, and memory access stages to simulate CPU functionality.

Simple Shell Implementation | *C* 2024

- Developed a simple shell program in C capable of executing system commands.

Automated Graph Plotting Script | *Python, Matplotlib, NumPy* 2024

- Created a script to automate high-quality graph plotting for CST Studio results in ASCII format.

Technical Skills

Languages: Java, Python, C, C++, Rust, HLS, Verilog, SystemVerilog, VHDL, SQL, NOSQL, Lisp, Go, Perl, Yaml
Developer Tools: Git, Docker, Vim, GNU+Linux, OpenBSD, LaTeX
Interests: Compilers, Operating Systems, Computer Architecture