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, ENineHQ Technologies PVT LTD
- 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/GHz domains; designed Ku/X-band microstrip patch antennas in CST Studio; built a Python-based GUI ASCII data preprocessor; explored deep learning for antenna data analysis.

Projects

Attendance Tracking System | *Java, Spring Boot, React* 2025
- Developed a secure full-stack attendance platform with analytics, auto-save, and role-based dashboards.

Commodore 64 Emulator | *Java* 2025
- Implemented a cycle-accurate Commodore 64 emulator with full hardware emulation.

Judoku - Sudoku Game | *Java, JavaFX* 2025
- Built a polished Sudoku game with multiple difficulty levels, timed/untimed modes, hints, and solver.
- Implemented puzzle generation, backtracking-based solver, and persistent leaderboards.

Minejweeper - Minesweeper Game | *Java, JavaFX* 2025
- Implemented a full-featured Minesweeper game with first-click safety, flood-fill logic, and multiple difficulty modes.
- Added persistent leaderboards, custom board configurations, and a classic Windows-style UI.

Jetris - Tetris Game | *Java* 2024
- Developed a Tetris game with multiplayer support, scoring progression, and modern UI.

Luma Lang | *Java* 2024
- Implemented a programming language with lexer, parser, and dual interpreted/compiled 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.

CST Studio Data Pipeline | *Python* 2024
- Built a GUI tool to extract and process S11, gain, and bandwidth data from CST Studio outputs.

Takenizer - Byte-Level BPE Tokenizer | *Python* 2025
- Implemented a UTF-8 byte-level tokenizer with Byte Pair Encoding (BPE) from scratch.
- Built reversible encode/decode pipelines and learned subword vocabularies via frequency-based merges.

Advx | *Python, PyTorch* 2024
- Implemented FGSM, PGD, CW, and DeepFool attacks and adversarial training for CNNs on MNIST.
- Achieved 98% accuracy under adversarial evaluation with robust benchmarking.

YASL Interpreter | *Python* 2024
- Built a REPL-style interpreter for a custom scripting language with variables, control flow, expressions, and subroutines.

Technical Skills

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