VIKASH PANDEY

ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	M.Tech in Cyber Security	Indian Institute of Technology Delhi	8.28
2023	B.Tech in Computer Science And Engineering	Bhilai Institute Of Technology, Durg	85.1% (Hons.)
2018	Chhattisgarh Board of Secondary Education	St. Michaels H S School Raigarh C.G.	89.34%
2016	Chhattisgarh Board of Secondary Education	St. Michaels H S School Raigarh C.G.	92.60%

IIT DELHI THESIS

Title: Dynamic Kernel-Level Defense System Using eBPF Telemetry and Syscall Profiling
Supervisor: Dr. Rajesh Kumar Pal & Prof. Vireshwar Kumar
Description:- Designed a **kernel-level defense mechanism** against memory corruption by using **eBPF** hooks to trace syscall invocation patterns.
-Efficient communicates between user-space monitoring logic and enforcement mechanisms. And Identified irregular **system calls** behavior and applied **runtime policy enforcement** to maintain secure, low-overhead execution.
-Deployed syscall filtering via dynamic profiling & seccomp-like logic, enforcing constraints on unauthorized invocations.
-Planned hardening Extensions: Develop an **Isolated Execution Environment** where programs are sandboxed and syscall-profiled using eBPF, allowing only policy-compliant processes to load into memory & blocking unsafe executions.

PROJECTS

• **Parallelized Quadratic Sieve algo with Runtime Optimization (Prof Ashok bhateja)** (Sept 2024 – Oct 2024) :
- Implemented the Quadratic Sieve algo. with **MPI-based parallel** workload distribution and **GMP** big integer arithmetic.
- Built a Vigenère cipher cryptanalysis tool using Kasiski examination, **Index of Coincidence**, and **Mutual Index of Coincidence**. Recovered encryption key and decrypted ciphertexts without prior knowledge of the key.

• **Multi-Client Network with Collision Control & Scheduling (Prof. Tarun Mangla)** (Sept 2024 – Oct 2024):
- Built a **multithreaded** TCP server architecture with **pthreads**, handle many concurrent clients under heavy load.
- Integrated **FIFO** scheduling for arrival-order and **Round Robin** scheduling to ensure fairness among concurrent clients.
- Devised **Slotted Aloha** and **Binary Exponential Backoff** communication protocols to manage collisions in network.

• **WhatsApp-style End2End encryption based ChatRoom (Prof. Ashok k bhateja)** (Oct 2024 – Nov 2024) :
- Simulated a real-time, end-to-end encrypted chatroom (WhatsApp-style) using **AES-CBC** with a fresh 16-byte **IV per message** and a **PBKDF2** derived shared key, so only authorized users can read messages.

• **Enhanced UDP with Reliability & Congestion Control (Prof. Tarun Mangla)** (Aug, 2024 - Sep, 2024) :
-Built **reliability into UDP** with ACK tracking, retransmission, fast recovery, numbering & timeout for efficient file transfer.
- Leveraged **cumulative acknowledgment** schemes to guarantee loss-free, in-order packet delivery over unreliable n/w.
-Engineered **TCP Reno-like** and **TCP CUBIC** congestion control for window adjustment, improves throughput & fairness.

• **Upgraded Kernel Functionalities in xv6 OS (Prof. Smruti Sarangi)** (May, 2025 - June, 2025):
- Implemented shell commands with **system calls** for execution logging, call restriction, and file access permissions.
- Engineered interrupt-driven **signal-handling** framework for process terminate, suspend, resume and custom handlers.
-Developed Dynamic **priority-boosted scheduler** with α/β-weighted priority tunable function that **prevents starvation**.

TECHNICAL SKILLS

• **Languages:** C,C++, Python; **Tools & Frameworks:** Git, Makefile, Wireshark, BurpSuite, NumPy, Gem5, Autopsy

POSITIONS OF RESPONSIBILITY

• **Nucleus Team Member (PG), OCS** (present) :-PG Nucleus Placement Coordinator of the ANSKSIT dept. Handled recruitment activities, pitched to companies, organized alumni sessions, and demonstrated adaptability, teamwork, leadership, and strong interpersonal communication.

QUALIFYING EXAMS

• **Graduate Aptitude Test in Engineering (GATE) Rank:** Secured **AIR 863** (99.30 percentile)

TEACHING ASSISTANTSHIP

• COL100: **Introduction to Computer Science** Under Prof. Sorav Bansal (Fall'24) And Vireshwar Kumar (Spring'25)
• COL703: **Logic for Computer Science** Under Prof. Vaishnavi Sundararajan (Fall'25)

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IIT COURSE

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M.Tech in Cyber Security	Indian Institute of Technology Delhi	8.28	---

POSITIONS OF RESPONSIBILITY

• Nucleus Team Member (PG), OCS (January, 2025 - January, 2026)

COURSES DONE

Advanced Data Structures, Computer Networks, Cryptography & Computer Sec., Introduction To Blockchains, Cryptocurrencies, And Smart Contracts, Resource Management In Computer Systems, Networks & System Security, Special Topics In Cyber Security