

ZAID KHAN

Srinagar, Jammu and Kashmir

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[LinkedIn](#)

[GitHub](#)

[Portfolio](#)

Education

National Institute of Technology Srinagar

Expected 2027

Bachelor of Technology

Projects

Standalone MOS 6502 CPU Core | *C++17, CPU Emulation, Testing*

2025 – 2026

- Extended and completed an unfinished standalone MOS 6502 CPU core by integrating a 64 KB memory bus, instruction execution, and reset, IRQ, and NMI handling.
- Corrected binary and decimal-mode ADC/SBC, branch and page-crossing cycle penalties, zero-page wrapping, stack operations, status flags, BRK, and RTI behavior.
- Added a runnable machine-code demonstration and 13 instruction-level tests covering arithmetic, branches, subroutines, stack behavior, and interrupts; all tests pass.

Redis-Compatible In-Memory Server | *C++17, TCP/IP, RESP, Multithreading*

2025 – 2026

- Built a minimal Redis-compatible server using POSIX TCP sockets and RESP, supporting PING, SET, GET, DEL, KEYS, and SAVE commands.
- Handled concurrent connections with a thread-per-client model and protected shared `unordered_map` storage using mutex-based synchronization.
- Implemented automatic snapshot persistence on writes and startup reload; verified live TCP command round trips and data recovery across server restarts.

A* vs. Dijkstra Maze Visualizer | *C++17, ncurses, Graph Algorithms*

2024 – 2026

- Built an interactive terminal visualizer that generates randomized mazes using recursive backtracking and represents cell connections with directional bitmasks.
- Implemented Dijkstra's algorithm and A* with a Manhattan-distance heuristic, instrumenting both to report path length, visited nodes, and execution time.
- Integrated a TCP/RESP client to serialize, validate, save, and reconstruct maze state through the companion Redis-compatible server.

Technical Skills

Languages: C++, C, Python

Computer Science: Data Structures & Algorithms, Complexity Analysis, Object-Oriented Design & Programming, Operating Systems, Computer Networks

Systems: POSIX Sockets, TCP/IP, RESP, Multithreading, Client-Server Architecture, CPU Emulation

Databases: Relational Databases (MySQL), Redis

Technologies/Tools: Linux, Git, Make, STL, ncurses

Leadership / Extracurricular

Cursor Hackathon

March 2026

Lead Organiser

NIT Srinagar

- Led the planning and execution of a two-day national-level hackathon in Kashmir, attracting 600+ students, developers, and technology enthusiasts.
- Coordinated logistics, participant operations, outreach, and on-ground execution across the two-day event.

Google Developer Student Club

Spring 2023 – Autumn 2024

Operations Lead

NIT Srinagar

- Organized workshops on Git, open-source contribution, and software development best practices.

Campus Relations Coordinator

2026

Coordinator

NIT Srinagar

- Managed external campus relations and coordinated student-focused initiatives with campus stakeholders.