

# B Sudharshan

## Software Engineer

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<https://portfolio-omega-umber-23.vercel.app/>

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final year B.Tech student specializing in Artificial Intelligence and Machine Learning with strong skills in C++, Python, and Data Structures & Algorithms. Passionate about software development, problem-solving, and applying ML concepts to build efficient and scalable solutions.

## Projects

### Compiler from Scratch (C++,NASM)

Jan 2025 - Mar 2025

Designed and implemented a complete compiler in C++ that translates a simplified high-level language to assembly. Implemented lexical analysis, parsing, AST construction, semantic checks, symbol-table management, and code generation for performance and correctness.

### Neural Network from Scratch (C++)

Aug 2025 - Present

Implemented a feedforward neural network from scratch in C++ with efficient custom matrix operations, forward propagation, backpropagation, loss computation, and gradient-descent training. Focused on numerical stability, optimization techniques, modular design to deepen ML and linear-algebra skills.

### Collaborative Whiteboard (Nextjs,Convex,Clerk)

Aug 2025 - Present

Built a real-time collaborative whiteboard using Next.js with Convex and Clerk, featuring drawing tools, sticky notes, multi-user presence, optimistic UI, and access controls. Implemented responsive layout, real-time sync, and secure auth to enable low-latency cross-device collaboration for scalable team workflows.

### Sorting & Pathfinding Visualizer(NextJs,Animations)

Present

Built a real-time web-based visualizer demonstrating classic sorting (e.g., Quick, Merge, Bubble) and pathfinding algorithms (e.g., BFS, Dijkstra, A\*) using interactive grid and bar graphics. Added algorithm selection, adjustable speed, and maze generation for hands-on learning.

## Core Skills

**Programming Languages:** C++, Python, JavaScript

**Development:** Next.js, React, Express, Prisma, SQL, NoSQL

## Education

### B.M.S. Institute of Technology and Management

Aug 2023 - Present

Bachelor of Engineering Artificial Intelligence and Machine Learning