

SHARDUL HIROLIKAR

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EDUCATION

Vishwakarma Institute of Technology, Pune | B.Tech, Computer Science (Artificial Intelligence) | 2024 – 2028 | CGPA: 9.22/10

Coursework: Data Structures & Algorithms, Object-Oriented Programming, DBMS, Foundations of AI & ML, Computer Architecture

TECHNICAL SKILLS

Languages: C++, JavaScript, TypeScript, Python, SQL, C, Lua

Frameworks & Libraries: Next.js, React.js, Node.js, Express.js, Flask, Streamlit, NumPy, Pandas

Databases & Tools: Supabase (PostgreSQL), Firebase, MySQL, Git, Linux/Unix Terminal

Core Concepts: Operating Systems, Computer Networks, OOP, DBMS, REST APIs, Authentication

PROJECTS

AceMyInterview – AI-Powered Mock Interview Platform | *Next.js · TypeScript · Supabase · Gemini API* | [GitHub](#) • [Live demo](#)

- Built and deployed a **full-stack AI interview platform using Next.js and Supabase**, implementing authentication, AI evaluation, speech interaction, session management, and analytics.
- Architected a **single-pass AI evaluation pipeline** that consolidates multi-question data into one Gemini API call, **cutting token overhead over 40%** and reducing response latency.
- Designed normalized PostgreSQL schema (7+ tables) with Supabase Auth and Row-Level Security (RLS) to enforce strict multi-tenant data isolation.
- Integrated native browser Speech-to-Text/Text-to-Speech APIs for a low-latency, hands-free interview experience with state-recovery support.

Systems & Low-Level Modules | *C++ · C · Python*

- Implemented an **O(1) LRU cache** using a Hash Map and Doubly Linked List.
- Implemented a `std::vector`-like dynamic array in C++ with manual heap allocation, amortized resizing, and a custom HashSet using linear probing.
- Implemented memory-efficient **A* pathfinding framework in raw C** for grid navigation in constrained, low-overhead environments.

Real-Time Cloth Physics Engine | *JavaScript · HTML5 Canvas* | [GitHub](#) • [Live demo](#)

- Implemented **Verlet-integration simulation engine** managing **3,200+ particles** and **7,200+ constraints**, sustaining **~800 FPS** (sub-2.5ms frame times) under heavy stress testing on 11th gen Intel i7.
- Optimized performance by **eliminating runtime allocation and GC overhead** using JavaScript TypedArrays (Float32Array, Uint16Array); implemented a custom 4-pass Gauss-Seidel constraint solver with real-time dynamic mesh cutting.

EchoDeck – AI-Powered Collaborative Flashcard Platform | *Flask · Firebase · Gemini API* | [GitHub](#) • [Live demo](#)

- Built an **end-to-end document-to-flashcard pipeline** using Gemini that converts **multi-page PDFs into structured study decks** with automated flashcard generation.
- Designed fine-grained **sharing and forking infrastructure** supporting public/private deck configurations with **granular permission management**.

Retro 2.5D Graphics Renderer | *JavaScript · C++* | [GitHub](#) • [Live demo](#)

- Programmed **Wolfenstein-3D-inspired raycasting engine** to compute real-time spatial **ray-plane intersections** on HTML5 Canvas.
- Developed a lightweight, dependency-free **3D vector arithmetic library (Vector3D-mini)** in C++ for matrix operations, coordinate projections, and **dot/cross-product calculations**.

ACHIEVEMENTS

- Indian Patent Application Published (Application No. 202521113731):** Smart Retrofit Fan Control System with Fuzzy Logic-Based Adaptive Control. Designed fuzzy control logic, simulated adaptive thresholds, and validated hardware prototype.
- Arbitrage Arena 2026 (IISc Bangalore) – National Semi-Finalist:** Developed an **LSTM financial time-series forecasting model** with custom feature engineering to **backtest trading strategies**.