SHARDUL HIROLIKAR

B.Tech CSE (AI) | VIT Pune | CGPA: 9.26/10 | +91 8857058550 | shardulrhirolikar@gmail.com
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TECHNICAL SKILLS

Languages: C++, Python, JavaScript

Frameworks: React.js, Flask, Express, NumPy, Pandas, Matplotlib

Tools: Git, MySQL, Firebase, RayLib/PyRay

Core Competencies: Systems Design • Performance Engineering • Graphics/Physics Simulation • Competitive Algorithms • Full-Stack Development • ML Integration

PROFESSIONAL ACHIEVEMENTS

Arbitrage Arena 2026 – IISc Bangalore (Top 20 National Finalist)

- Developed LSTM-based time-series models for financial prediction; trained and validated on real market data with backtesting under extreme conditions (flash crashes, volatility spikes); optimized robustness using Sharpe ratio and risk-adjusted metrics

Competitive Programming – LeetCode

- 230+ problems solved: data structures, graph algorithms, dynamic programming, greedy techniques; demonstrated expertise in space-time optimization and algorithmic problem-solving

Patents & Intellectual Property

- Co-inventor of granted Indian patent: "Smart Retrofit Fan Regulator Using Fuzzy Logic Control" – Designed control logic, rule framework, hardware prototyping, and system validation

ENGINEERING PROJECTS

Ray Casting Engine (JavaScript | Performance Optimization, Graphics Programming)

- 2.5D raycasting engine using DDA-based grid traversal; achieved **~60 FPS on ~8,000 rays/frame (~16ms latency)** on large maps (~640k cells). Designed rendering pipeline with FOV projection, fisheye correction, distance-based shading; optimized memory layout and algorithm for frame-time consistency

Interactive 2D Cloth Simulation Engine (Python/PyRay | Physics Simulation, Constraint Dynamics)

- Real-time cloth simulation using constraint-based mass–spring systems with Verlet integration; implemented **dynamic constraint re-computation** enabling real-time slicing and interaction. Optimized simulation stability through damping tuning, constraint solver design, and render-loop synchronization

Echo-Deck – AI-Powered Collaborative Flashcard Platform (Flask, React, Firebase, Gemini API)

- Full-stack AI platform converting PDFs/text into active-recall study material; integrated Gemini API for automated Q-A generation. Implemented **few-shot prompting pipelines and validation logic** to reduce LLM hallucinations. Architected RBAC and collaborative workflows (deck forking, sharing, curation). Deployed production-ready system with end-to-end backend/frontend integration on Firebase

INVOLVEMENT & OPEN SOURCE

- **GirlScript Summer of Code 2025:** Active open-source contributor; submitted multiple PRs as part of 3-month mentorship program.
- **PCCoE Indradhanu Hackathon 2025:** Advanced to Stage 2; developed AI-driven climate change solution showcasing applied ML and systems design.
- **GameDev+ Club Coordinator, VIT Pune:** Led 3D asset creation, rigging, and development documentation for collaborative game projects.