

# SNEHAL DAS

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## EDUCATION

S.R.M. Institute of Science and Technology (SRMIST KTR) | Chennai, TN | Expected 2029

CGPA: 9.0/10

- B.Tech in Computer Science & Engineering. 3 Internships completed in Year 1.

## SKILLS

- Languages: Python, JavaScript, Java, Dart, C, C++ , HTML/CSS
- Frameworks/Tools: HTML5, CSS3, Tailwind CSS, Flutter, Figma, Git, GitHub, REST API, FastAPI, Next.js, TypeScript, React, WebSocket, Zustand, Qiskit, Gemini API
- Concepts: OOP, Data Structures, Algorithm Design, Post-Quantum Cryptography, Responsive Web Design

## PATENTS & RESEARCH

**Post-Quantum Cryptography Frameworks** | *Research & Intellectual Property* | 2026

- **Patent 1: Rem-Mark1 Encryption Model (Co Inventor):** Invented a novel cyclic key encryption model for high-security state machines; worked with a peer to stress-test mathematical edge cases. (In preparation for filing)
- **Patent 2: Chess-Based Encryption Model (Sole Inventor):** Partnered on a cryptographic pipeline deriving matrix transformations from chess simulations; personally resolved critical edge cases in the transformation matrix. (In preparation for filing)
- Research work : **Post-Quantum Cryptography Frameworks using kyber-crystal architecture re-enforced with rem-Mark1 and CBE model**

## PROFESSIONAL EXPERIENCE

### Consultancy Vistalane

Frontend Developer (Contract) | Nov 2025 – Feb 2026 | Chennai, TN

- Delivered 3 frontend feature sets on schedule by triaging a prioritised task board and resolving blockers within 24 hours, achieving 100% on-time deployment.
- Integrated Flutter UI components into 2 live client applications, prototyping screens in Figma first to eliminate layout rework across revision cycles.
- Validated cross-device compatibility across 3 screen-size breakpoints for 4 web pages, ensuring consistent rendering on mobile, tablet, and desktop.

### Cognifyz Technologies

Web Development Intern | Dec 2025 – Jan 2026 | Remote

- Engineered responsive web pages in HTML5, CSS3, and JavaScript, achieving consistent display across 5 browsers and 3 device categories.
- Deployed and maintained 2 client-facing websites; bi-weekly content audits resolved 12 broken links and display errors, sustaining 100% uptime across the internship period.
- Refactored legacy CSS across 3 components, reducing stylesheet size by ~20% without altering visual output.

### Cognifyz Technologies

Python Development Intern | Jan 2026 – Feb 2026 | Remote

- Conducted structured code reviews across 3 sprint cycles, identifying 15+ quality issues and documenting resolutions to maintain repository integrity.

- Established Python coding guidelines adopted by 4 developers, reducing style-related review comments by ~30% within the first sprint.
- Analysed and documented system requirements for 2 internal modules, reducing pre-development specification queries by an estimated 40%.

## TECHNICAL PROJECTS

### Nutrix – AI-Powered Nutrition Tracker

Full-Stack Developer | [GitHub Link](#)

- Architecture & State: Engineered a high-performance single-page application (SPA) using vanilla JavaScript, building responsive layouts, interactive Chart.js macro trend dashboards, and Mifflin-St Jeor calculators.
- Session & Infrastructure: Developed serverless backend routes on Vercel with cookie-backed session persistence, maintaining secure user states and local meal logging history with zero database overhead.
- API Hooks: Structured the application's core data schema and async state controllers, provisioned downstream state hooks to seamlessly delegate external LLM (Gemini API) pipelines to cross-functional contributors.

### Quantum Lab — Quantum Circuit Simulation Platform

Full-Stack Developer | 2026 | Next.js · TypeScript · React · FastAPI · Python · Qiskit · WebSocket · Zustand

<https://qinsight-sigma.vercel.app/>

Architected a full-stack quantum computing simulator with an interactive circuit builder supporting 20+ gates (H, X, CNOT, CRX, QFT, Grover, Oracle), real-time step-by-step statevector playback, and Bloch sphere visualization per qubit.

- Engineered a FastAPI/WebSocket backend that compiles gate sequences, expands composite gates (e.g., SWAP → 3 CNOTs), and runs Qiskit Aer simulations — returning per-step statevectors for up to 8-qubit circuits.
- Implemented a dual-circuit comparison mode and a variational/hybrid workflow with theta-scan optimization, returning depth, gate count, and cost metrics across all iterations.

### MotionCanvas – Hands-Free Assistive OS Controller Systems & Core Infrastructure Developer | C++ · Python ·

CMake · WebSocket · MediaPipe [Github Link](#)

- Real-Time Processing Pipeline: Engineered a zero-cloud, cross-platform assistive OS controller leveraging MediaPipe FaceMesh to track 478 local facial landmarks, routing coordinates into a high-throughput native C++ engine (compiled via CMake to libengine.dylib).
- Embedded Signal Processing: Implemented a decoupled class-based detector architecture incorporating adaptive Kalman filtering, saccade detection, and circular data buffers to process intentional blinks, jaw clenches, and multi-axis head poses with minimal jitter.
- Native OS Automation: Built an asynchronous Python orchestrator utilizing pynput to translate compound C++ gesture signals into macOS-native mouse events, window scaling actions, and system hotkeys within a strict 40ms frame-rate budget.
- State Synchronization & UX: Constructed an active WebSocket layer to stream real-time configuration matrices and telemetry payloads directly to a lightweight frontend configuration dashboard, allowing on-the-fly threshold remapping without server restarts.

### ApexPredict: Formula 1 Tyre Degradation Predictive Pipeline Machine Learning & Data Engineer | Python ·

FastF1 API · Scikit-Learn · Data Analytics [Github Link](#)

- Telemetry Ingestion Pipeline: Engineered a data parsing pipeline using the FastF1 API to extract multi-modal motorsport telemetry, processing real-time vehicle speed, RPM, throttle inputs, gear selections, and tyre

characteristics.

- **Non-Linear Predictive Modeling:** Developed and cross-evaluated machine learning regression frameworks to model the highly non-linear 5-phase tyre degradation curve, accurately mapping transitions across the Warm-Up, Peak Performance, Gradual Degradation, and severe Tyre Cliff phases[cite: 1].
- **Statistical Evaluation Optimization:** Maintained strict evaluation metrics to minimize variance across telemetry data arrays, benchmarked performance utilizing Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and  $R^2$  scores to identify optimal predictive architectures for real-time race strategy simulation.

## ACHIEVEMENTS & COMPETITIONS

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- **Top 10 Finalist (out of 350 teams):** ULTRON 9.0 — National IEEE Hackathon. Directed development for the team.
- **Top 80** globally in an International Coding Contest; qualified for **ICPC Multi-Provincial Contests**.