Tanay Kinariwala

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Education

Sardar Patel Institute of Technology | CGPA: 9.53/10 **Aug 2023 - Present**
B. Tech in Computer Engineering

SP Jain Institute of Management and Research | CGPA: 8.00/10 **Jan 2025 - Present**
Minor in management

Experience

IIT Bombay – Research Intern **Jan 2026 – Jun 2026**
AI-Based Demand Responsive Transit & Intelligent Transportation Systems

- Developed the **TTTO** algorithm on **2.12B+ GPS records** from **38,745 trips**, reducing **vehicle kilometers traveled by 47.6%** and **route cycle time by 49.6%**.
- Engineered a scalable geospatial analytics pipeline incorporating **HMM-based map matching, trip segmentation, occupancy prediction, and hotspot detection** for intelligent transportation systems.
- Built and deployed a production-grade transportation dashboard using **React, FastAPI, MongoDB, Docker, and AWS**, enabling real-time fleet monitoring, route adherence analytics, and driver attendance management.

Deloitte - Technology and Transformation | Software Engineer Intern **Jun 2025 – Aug 2025**

- Developed and deployed a **full-stack web application** for a major banking client, implementing responsive UI, backend APIs, and database integration in an Agile environment.
- Collaborated with **cross-functional development, QA, and business teams** to deliver production-ready features and support client-facing project milestones.
- Identified and resolved **production defects** through testing, debugging, and code validation, contributing to the successful delivery of enterprise software solutions.

Freelance Software Developer **May 2025 – Present**
Parth Enterprises — Polyblend — Boncare

- Delivered **3 end-to-end full-stack web applications** for businesses across healthcare and manufacturing domains using the **MERN** ecosystem.
- Led the complete software development lifecycle, including requirement analysis, UI/UX design, backend architecture, database design, deployment, and post-deployment support.
- Developed responsive, **SEO-friendly**, and scalable applications with secure authentication, REST APIs, and **cloud deployment** tailored to client requirements.

Publications

A Sovereignty-Preserving Enterprise AI Copilot with Hybrid Retrieval and Self-Healing Text-to-SQL
Accepted at the 1st International Conference on Statistical Learning, Data Science & Generative AI (ICSL-DSGA 2026)

- Proposed a model-agnostic Enterprise AI framework integrating Hybrid RAG, self-healing Text-to-SQL, and RBAC, achieving **91.7%** SQL execution success while preserving enterprise data sovereignty.

Multi-Agent RAG for Automated Grading
Accepted at the 18th International Conference on Contemporary Computing (IC3)

- Proposed a Multi-Agent RAG framework combining **Actor–Critic Reflexion** and two-stage retrieval, achieving **98.97%** grading correlation with human evaluators while reducing hallucinations to **1.8%**.

Two-Stage Time-Topological Optimization for Demand-Responsive Feeder Transit Design on Arterial Networks
Accepted at the 12th Conference on Transportation Systems Engineering & Management (CTSEM)

- Developed a Two-Stage Genetic Optimization framework for demand-responsive transit using **2.1B+** GPS records and **38,745** commuter trips, achieving **47.6%** lower VKT and **49.6%** shorter route cycle times.

Machine Learning–Driven Weekly Momentum Stock Selection System with Walk-Forward Validation
Presented at the 8th Pan-IIT International Conference on Financial Markets & Corporate Finance

- Proposed a machine learning-driven momentum investing framework leveraging walk-forward validation and ranking-based portfolio optimization over **4,000+** stocks across **60+** weeks, achieving **+5.59%** average weekly alpha over the market benchmark.

Cryptographic API Misuse Detection Using BERT-Based Model

Published in the 2026 International Conference on Innovative Trends in Information Technology (ICITIIT), IEEE Xplore

- Developed a BERT-based deep learning framework for automated cryptographic API misuse detection, enabling accurate vulnerability identification in source code.

Projects

Enterprise AI Platform | *React, FastAPI, PostgreSQL, LangChain, LLMs*

- Developed a plug-and-play enterprise AI platform supporting **PDFs, Word, Excel, CSV, SQL databases, and images**, enabling secure **RAG-based** natural language interaction across all major document formats.
- Designed a modular model-agnostic architecture allowing seamless integration of different LLMs based on **user roles, access policies, and deployment requirements**, supporting enterprise-scale AI adoption.
- Evaluated the platform on **250+ SQL security test cases** and **200+ enterprise documents** for retrieval performance, incorporating RBAC, semantic search, and secure database query generation.

Momentum Investing using Machine Learning | *Python, XGBoost, Scikit-learn, Pandas*

- Developed a machine learning framework for momentum-based stock selection, analyzing **4,000+ companies weekly** using **60+ weeks** of historical market data and technical indicators.
- Designed an end-to-end prediction and backtesting pipeline with feature engineering and walk-forward validation, consistently achieving an **average portfolio return 6% higher than the BSE 500 benchmark**.
- Built an interactive analytics dashboard for portfolio visualization, strategy evaluation, and comparative performance analysis.

Automated Answer Sheet Evaluation System | *Python, PyTesseract, RAG, LLM APIs*

- Developed an AI-powered answer evaluation system integrating **OCR, Retrieval-Augmented Generation (RAG), and LLMs** to automate descriptive answer assessment across **1,000+ answer sheets**.
- Designed a customizable rubric-based evaluation pipeline supporting **5+ academic subjects**, enabling domain-independent semantic grading and automated feedback generation.
- Built a scalable end-to-end workflow for handwriting extraction, rubric-aware scoring, and context-aware evaluation, significantly reducing manual grading effort while improving consistency.

Positions of Responsibility

Joint Secretary | *Rotaract Club of SPIT* **Aug 2024 – Jul 2025**

- Coordinated **100+ members** to successfully execute **20+ large-scale events** with a cumulative participation of **4,000+ attendees**.

Vice Chairperson | *Sardar Patel Consulting Group* **Aug 2025 – Present**

- Managed end-to-end client engagement for **4+ industry clients**, driving project planning, stakeholder communication, and timely delivery of technology consulting solutions within **3 months**.

Director General | *Model United Nations, SPIT* **Jan 2025**

- Directed and organized a university-level **Model United Nations conference** with **500+ participants**, overseeing planning, committee operations, and cross-functional event execution.

Technical Skills

Programming Languages: Python, Java, C, JavaScript, SQL
AI & Machine Learning: PyTorch, TensorFlow, Scikit-learn, LangChain, Hugging Face, OpenCV, XGBoost
Web & Frameworks: React.js, Next.js, Node.js, Express.js, FastAPI, Flask
Databases: PostgreSQL, MySQL, MongoDB, SQLite, FAISS, ChromaDB
Cloud & DevOps: Docker, Git, GitHub, AWS, Vercel, Postman
Core Concepts: Retrieval-Augmented Generation (RAG), LLM Agents, Multi-Agent Systems, NLP, Computer Vision,Vector database, REST APIs

COMPETITIONS / EXTRACURRICULARS

- **Winner: HackNova - 24 hour** Hackathon with over **125+ teams,** built a full stack college portal.
- **Winner: SPIT Oddesys** – Frontend Hackathon with over **50+ teams,** redefined **cybersecurity** portal.
- **Winner: SPIT BCS** –Business Case Study with **60+ teams**, analyzed business models of food delivery apps.

CERTIFICATIONS

Udemy: The Complete Full-Stack Web Development Bootcamp
Udemy: Machine Learning A-Z: AI, Python