SURAJSINH PATIL
Course : **M.E.**, Computer Science, 2027
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CGPA : 7.17

ACADEMIC DETAILS

COURSE	SPECIALIZATION	INSTITUTE/COLLEGE	BOARD/UNIVERSITY	SCORE	YEAR
UG	Computer Science	MES Wadia College of Engineering, Pune	Savitribai Phule Pune University	8.58 CGPA	2024
CLASS XII		Chh Shahu Academy & Junior College, Satara	Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE)	81.69 %	2020
CLASS X		Mona School Satara	Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE)	93.2 %	2018

Technical Proficiency	C++ Language, Python, SQL, JavaScript, React, Node.js, Express.js, PostgreSQL, Git, Docker, gRPC, Protocol Buffers, Distributed Systems, Concurrency, Machine Learning, Vision-Language Models (LLaVA), Prompt Engineering, HTML + CSS, Explainable AI, C Programming
Subjects / Electives	DBMS, Advance Operating Systems, Operating System, Computer Networks, Advance Computer Networks, Computer Organisation & Architecture

PROJECTS

Mini Coding Platform - Full-Stack Development **May 2026 - Jul 2026**

- Built a full-stack **LeetCode style online coding platform** using **React, Node.js (Express), and PostgreSQL**, enabling users to browse coding problems, submit solutions, and receive automated evaluation.
- Developed a modular backend using **Express.js** with RESTful APIs, middleware, and controller-based architecture for scalable and maintainable request handling.
- Designed and implemented a normalized **PostgreSQL** database schema to manage users, coding problems, hidden test cases, submissions, and execution results.
- Built an end-to-end submission pipeline connecting the React frontend, Express API, execution engine, and database to evaluate user submissions and return real-time verdicts.
- Implemented a code execution engine supporting **C++** submissions, generating verdicts including **Accepted, Wrong Answer, Compilation Error, Runtime Error, and Time Limit Exceeded**.
- Integrated **Docker based sandboxing** to isolate user programs during execution, providing resource-limited evaluation of untrusted code against hidden test cases.

Distributed Ticket Booking System - Distributed Systems **Sep 2025 - Dec 2025**

- Developed a **fault-tolerant distributed movie ticket booking system** in Python as part of a three member team using the **Raft consensus algorithm** for leader election, log replication, and replicated state management.
- Implemented a backend composed of **six gRPC microservices** (Authentication, Booking, Payment, Admin, Chatbot, and Raft) communicating through **Protocol Buffers**.
- Designed concurrent seat reservation logic using thread-based synchronization to prevent double booking during simultaneous booking requests.
- Validated fault tolerance by simulating node failures and demonstrating automatic leader re-election while maintaining booking consistency across the cluster.
- Integrated session-based authentication with TTL, one-step reserve-and-pay workflow, refund handling, and an **OpenAI-powered customer support chatbot** with rule-based fallback.

Explainable Vision-Language System for Banana Leaf Disease Diagnosis - Machine Learning / Explainable AI **Jan 2026 - May 2026**

- Co-authored a multimodal banana leaf disease diagnosis system using the **BananaLeaf-Field-3K** dataset containing **3,023 real-field images** across Healthy, CMV, and Sigatoka classes.
- Designed and evaluated **five zero-shot prompting strategies** for **LLaVA-1.5-7B**, establishing baseline performance before parameter-efficient fine-tuning.
- Fine-tuned the vision-language model using **LoRA (~0.6% of 7B parameters)**, achieving a significant improvement over the zero-shot baseline while reducing training cost.
- Developed a lightweight explainability pipeline combining **EfficientNet-B0**, **Grad-CAM**, and LLaVA to generate human-verifiable visual and textual explanations suitable for edge deployment.
- Submitted the research to the **ICML 2026 AI4GOOD Workshop**, focusing on trustworthy and explainable AI for precision agriculture.

POSITION OF RESPONSIBILITY

Teaching Assistant in Computer Networks - BITS Pilani **Jan 2026 - May 2026**

- Facilitated Computer Networks lab sessions under faculty guidance, supporting students through hands-on practicals in packet analysis (Wireshark) and socket programming.
- Guided students in debugging socket-based client-server programs and interpreting captured network traffic to reinforce core networking concepts (TCP/IP, protocols, packet structure).

Teaching Assistant in Machine Learning - BITS Pilani **Aug 2025 - Nov 2025**

- Supported ML model implementation and evaluation for coursework/project assignments, assisted with data preparation, feature processing, and result analysis.
- Collaborated with faculty to refine approaches and improve model performance through regular technical discussions.

EXTRA CURRICULAR ACTIVITIES

Karate- District Gold Medal, State Bronze Medal

LANGUAGES KNOWN

Marathi, Hindi, English