Mankirat Singh

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EDUCATION

Thapar Institute of Engineering and Technology, Patiala Expected Graduation, May 2026
B.E. Computer Engineering Patiala, Punjab

EXPERIENCE

Open Source Contributor May 2025 - September 2025
Google Summer of Code - PostgreSQL Remote

- Built an ABI compliance reporting system for **PostgreSQL** with Perl and libabigail, improving software stability.
- Collaborated with PostgreSQL core contributors to refine the tool based on the community's requirements.
- Designed the tool to play a key role in PostgreSQL 18, ensuring ABI stability in future minor releases.
- Navigated a 20-year-old undocumented codebase of Postgres BuildFarm, demonstrating strong analytical abilities.
- Authored technical documentation to support the PostgreSQL community and promote knowledge sharing.

Associate Software Development Intern June 2025 - August 2025
Fenmo.AI Remote

- Automated financial reconciliation for 50+ daily PDFs using LLMs in **Python**, cutting manual effort.
- Built a scalable backend with **FastAPI** and **Celery** to automate and accelerate reconciliation.
- Developed reliable data extraction pipelines (95% accuracy) with multi-format support and auto-validation.
- Improved classification pipeline, boosting output coverage from 85% to 99% by fixing edge cases.

Student Developer Intern January 2024 - August 2025
Thapar Institute of Engineering and Technology On Site

- Developed the **Feedback Application System** (Flutter, PHP) to streamline teacher feedback across 10,000+ users.
- Built scalable, containerized backend services with **Docker Compose**, ensuring consistent multi-user performance.
- Implemented constraints for Python based **Genetic Algorithm timetable scheduler** handling 500+ courses.
- Created **FastAPI** and SQL based APIs for data analytics, workload optimization, and dashboard integration.

PROJECTS

LUNAR (Javascript, ReactJS, ThreeJS, YOLOv5) Project Link
Detection of Safe Navigation Routes on Moon for rovers based on Chandrayan 2 Data.

- Led a team of 4 to create scalable data processing pipelines for spectral and optical data analysis.
- Reconstructed 3D lunar surface by geo-referencing Chandrayaan-2 data using Three.js in React.
- Simulated rover traversal on lunar terrain in a web-based 3D environment by using Cannon.js with Three.js.
- Awarded by **President of India** as National Winners of ISRO's Bharatiya Antariksh Hackathon.

InSMoS (Python, FastAPI, PostgreSQL, TimescaleDB, RabbitMQ) Under Progress
Real time Infantile Spasms Detection System in collaboration with **PGI Chandigarh**.

- Engineered a real-time ingestion pipeline using MQTT with RabbitMQ and ESP32 to collect EEG signals.
- Fabricated and implemented a backend service with Python and FastAPI for EEG time series data.
- Utilized PostgreSQL with TimescaleDB to efficiently store and manage high volume(256 SPS) EEG time series data.
- Developed a bidirectional channel using WebSockets to deliver real-time data from backend to frontend.

TECHNICAL SKILLS

Languages	JavaScript, C, C++, Python, PHP, Perl, Bash, Go, Java, HTML, CSS
Tools	Linux, Docker, Flutter, NextJS, NodeJS, FastAPI, MongoDB, Redis, SQL
Libraries/**Cloud**	ReactJS, Pydantic, Faiss, Instructor, Transformers, Firebase, AWS, GCP, GitHub Actions
Courses	Object Oriented Programming (OOP), TCP/IP, REST APIs, Software Testing
Competitive Programming	Rated 950+ on Codeforces(Profile).

LEADERSHIP EXPERIENCE

Technical Head, Microsoft Learn Student Chapter, TIET *April 2024 - Present*

- Mentored 150+ students on hackathons, open-source, and guiding the chapter's overall direction in technology.
- Led teams of 20 developers as Coordinator for Makeathon 6 Website (2000+ visitors) and App (300+ users).

ACHIEVEMENTS

National Winners	Bharatiya Antariksh Hackathon by ISRO on 1st National Space Day	August 2024
Runner Up	Rewarded at HackTU 5.0 hackathon conducted by CCS TIET	February 2024
Hackathon Winner	First place in OWASP TIET Internal Hackathon	July 2023