Saksham Mishra

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Education

Thapar Institute of Engineering and Technology **Patiala, Punjab**
Bachelor of Engineering in Computer Engineering *Aug. 2024 – June 2028 (Expected)*

Work Experience

Intelligent Digital AI twin (UK-India) **Remote**
Technical Lead (Student Team) | Advisor: Dr. Devnaad Singh *Aug. 2024 – Present*

- **Leadership:** Spearheaded development as the youngest team member (Sophomore), designing core architecture and authoring **100% of the codebase** while guiding Master's-level researchers on integration.
- **Agentic AI System:** Engineered a Digital Twin using **Multi-Agent Reinforcement Learning (MARL)** to simulate UK supply chain disruptions and autonomously predict waste reduction strategies.
- **Impact:** Research accepted for presentation at **19th ISDSI-Global Conference 2025**; led the translation of theoretical models into a deployable Python-based simulation pipeline.

ISRO-IIT Ropar Collaborative Research Project **Ropar, India**
Research Intern | GPS-Denied Autonomy *Aug. 2025 – Present*

- **GPS-Denied Navigation:** Architecting signal-processing subsystems for unmanned aerial systems, utilizing **Software Defined Radios (PlutoSDR)** to navigate in jamming-heavy environments.
- **Signal Analysis:** Orchestrating extensive experimentation with GNSS signals, characterizing frequency-domain signatures to analyze intentional interference and spoofing scenarios.
- **SDR Optimization:** Iteratively developing Python-based SDR pipelines for real-time spectrum sensing and modulation analysis with low-latency constraints.

UbiSys Lab, IIT Jodhpur **Jodhpur, India**
Research Intern | Advisor: Dr. Suchetana Chakraborty *May 2025 – Aug. 2025*

- **Mobile Telematics Engine:** Engineered a Flutter app to harvest raw **IMU sensor streams** and GNSS telemetry, creating a proprietary dataset of real-world driving maneuvers.
- **Sensor Fusion:** Developed backend logic to synchronize asynchronous sensor timestamps, fusing kinematic data (Accelerometer/Gyroscope) with geospatial coordinates for trajectory reconstruction.
- **Contrastive Learning:** Architected a **SimCLR-based framework** to learn robust driver representations from unlabeled sensor data, validating the system for **AAAI 2025**.

Technical Projects

Hybrid Spatio-Temporal ASL Recognition System | *Python, TF, OpenCV* **Jan. 2025 – Aug. 2025**

- **Multi-Stream Architecture:** Engineered a pipeline fusing spatial features (**MobileNetV2**) and skeletal topology (**MediaPipe**) into a **Bi-LSTM** network, achieving **99.56% accuracy**.
- **Edge AI Deployment:** Deployed quantized model on **Raspberry Pi 4B** for real-time inference (¿30 FPS) and implemented **Grad-CAM** for model explainability.

Image De-Raining for Outdoor Vision Systems | *PyTorch, UNet* **Jan. 2025 – Present**

- **Pipeline Engineering:** Engineered a **UNet-based pipeline** to dynamically remove precipitation artifacts from outdoor camera feeds, significantly enhancing structural similarity (SSIM).
- **Robustness Optimization:** Refining data preprocessing workflows to improve vision system performance under diverse real-world weather conditions.

Technical Skills

Languages: Python, C/C++, Golang, SQL, Dart (Flutter), JavaScript, Kotlin
AI & Research: PyTorch, TensorFlow, RAG, LangGraph, Multi-Agent Systems, OpenCV, Reinforcement Learning
Web & Backend: FastAPI, Flask, Express.js, React.js, REST APIs, Microservices Architecture
Tools & Platforms: Git, Docker, Linux, PlutoSDR (Signal Processing), MongoDB

Leadership & Awards

Thapar Venture Club (TVC) | *Technical Coordinator* **Nov. 2024 – Present**

- Architected official event platforms for **E-Summit'25** and **CaseQuest'25** using React/Node.js, handling high-traffic registrations and dynamic content rendering.

MLSC Thapar Chapter | *Technical Coordinator*

- Led technical development for flagship hackathon **Makeathon8**; designed workshops on AI/ML fundamentals

Awards

- **Winner, HackTU 6.0:** Recognized for rapid prototyping and innovative solution design (First Year Hack Award).