

# Shashank Sharma

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## EDUCATION

### M.Tech in Computer Science & Engineering (AI Specialization)

Indraprastha Institute of Information Technology, Delhi

2023 – 2025

CPI: 8.07/10

### B.E in Information & Communication Technology

Adani Institute of Infrastructure Engineering, Ahmedabad (Gujarat)

2019 – 2023

CPI: 9.22/10

## RESEARCH & WORK EXPERIENCE

- **Research & Innovation Engineer** | TCS Research | Guides: Dr. Barnali Basak, Sounak Dey (Sep'25-Present)
  - Working on bridging the gap between General **Neuromorphic** frameworks and hardware-specific framework.
  - Designed and Ported Spiking Neural Networks using **SNNTorch**, **Rockpool**, **Lava** and **Sinabs** frameworks, achieving **96%** accuracy on Timeseries Classification and a performance drop of upto **2%**.
- **Post Graduate Researcher** | MIDAS Labs IIITD | Guide: Dr. Rajiv Ratn Shah (Dec'23-Sept'24)
  - Led three research initiatives in multimedia analysis, contributing to one publication in IEEE MIPR Conference
  - Collaborated with international research teams, resulting in novel methodologies with **8%** improved latency

## PUBLICATIONS

- **Pulse of the Crowd: Quantifying Crowd Energy through Audio and Video Analysis** |  (Sep'25-Present)  
*IEEE 7th International Conference on Multimedia Information Processing and Retrieval (MIPR), 2024.*
  - Multimodal pipeline including **STEERER** model for crowd density estimation and CLAP-based audio embeddings for noise classification .
  - Curated a labeled audio dataset with 50 minute positive audio and 40 minute neutral audio and achieved **0.85** accuracy in positive-noise classification with **ResNet50**.
- **Advanced Smart City Monitoring: Real-Time Identification of Indian Citizen Attributes** |  (Sep'25-Present)  
*arXiv preprint arXiv:2407.03305, 2024.*
  - Developed a **Person Attribute Recognition** pipeline using pretrained transformers, fine-tuned on pedestrian images to detect clothing, pose, and headgear; deployed for real-time use with **YOLOv10** and cascading.
  - Applied **dropout** and **ScaledBCELoss** reducing overfitting, achieving **0.86** accuracy and reducing latency by **98%**.

## PROJECTS

- **Knowledge-Augmented LLMs for Intent Based Summarization** | Guide: Dr. Shad Akhtar |  (Jan'25-Apr'25)
  - Developed a pipeline generating perspective-based summaries using classifier-guided and energy-based losses.
  - Implemented **PEFT** techniques and **Prefix Tuning** on Flan-T5/ LLaMA3; achieving **0.78** BLEU score.
- **Accident Detection using Video Streaming** | **MIDAS Labs, IIITD + TU Darmstadt, Germany Collaboration** (June'24-Sept'24)  
Guides: Dr. Rajiv Ratn Shah, Dr. Manisha Luthra, Avinash Anand
  - Developed two accident detection pipelines, using **YOLO** with **Deep SORT** and **LLaVA-NeXT** model
  - Leveraged OpenCV preprocessing to optimize performance and reduce latency by **8%**
- **Deep Reinforcement Learning for Autonomous Navigation** | Guide: Dr. Sanjit Kaul |  (Sep'24-Dec'24)
  - Re-implemented RL approach to navigate knowledge graphs; policy uses **LSTM** and **REINFORCE** optimization.
  - Achieved **95.10** AUC-PR metric on Countries-S3 dataset, beating other baselines

## TECHNICAL SKILLS & RELEVANT COURSES

- **Languages :** Python, C++.
- **Libraries/Tools & Technologies:** PyTorch, Huggingface, Langchain, ChromaDB, Ollama, Streamlit, SNNTorch, Linux, Windows, Git, Github.
- **Courses :** Machine Learning | Deep Learning | Reinforcement Learning | Natural Language Processing | Artificial Intelligence | Information Retrieval | Data Structure & Algorithms | Operating Systems | Object Oriented Programming.

## POSITIONS OF RESPONSIBILITY

- Served as Teaching Assistant for courses including NLP, DSA, AI, and Intelligent Systems.
- Conducted labs, resolved doubts, mentored students, and evaluated assignments and exams.

## ACHIEVEMENTS

- Secured **2nd Position** in Smart City Surveillance Challenge 2024 (*Vehant Technologies*)
- **Winner** of Smart Product Design Challenge: Ideathon, *TechSpectra 2024*, IIITD
- Qualified with **93.90 percentile** in **GATE CSE 2023**
- Cleared JEE ADVANCED 2020