Deepshikhar Gupta

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Education

- **Visvesvaraya National Institute of Technology, Nagpur:** *B.Tech* (*Sep'24*)
  - B.Tech in Metallurgical Materials Engineering, VNIT Nagpur — CGPA 8.33/10
  - B.Tech Project / Thesis: ML-guided optimization of precipitation-strengthened Al alloys
  - Coursework: Artificial Intelligence for Engineers, Computer Programming, Mathematics, Numerical Methods & Computation, Dealing With Materials Data - Collection Analysis And Interpretation
- **St. Xavier's School, Jaipur:** *CBSE(XII)* (*2019*)
  - Scored 89.2% in the Science stream with subjects: Physics, Chemistry, Mathematics, Economics
  - Ranked among the top performers of the batch
- **GGES, Jaipur:** *RBSE(X)* (*2017*)
  - Achieved 90.62%
  - Batch Topper (Nursery – Class X) and consistently ranked 1st throughout school years

Experience

- **KaBloom(Fresh Flower E-commerce):** *Data Scientist* (*Oct'24 - Present*)
  - Built weekly & seasonal demand-forecasting pipeline (LSTM + XGBoost + Transformer ensembles) using 3 years of sales & weather data, improved on-time stock allocation and reduced stockouts and perishable waste
  - Applied clustering and segmentation analysis to identify customer cohorts, increasing repeat purchases through targeted offers
  - Performed sentiment analysis on customer reviews using NLP, surfacing key service and quality issues that informed product improvements
  - Automated data pipelines in Python and SQL for weekly reporting, cutting manual analysis time by 6+ hours per week
  - Designed interactive dashboards (Tableau, Power BI) integrating sales, delivery, and vendor data, enabling management to make data-driven decisions
  - Collaborated with logistics and marketing teams, translating complex ML findings into actionable business insights
- **HiDevs:** *Data Scientist* (*Mar'24 - Sep'24*)
  - Co-built Ragrid, an open-source RAG optimization library [Link] ✇ that automates chunking strategy selection, embedding model choice and vector store config. Added automated evaluation/ablation tests and improved retrieval precision for downstream QA systems
  - Led development of TalentScout, a job–resume retrieval engine combining BM25 + vector search with rank fusion and cross-encoder reranking, returning the top 5–10 most relevant candidates per recruiter query
  - Engineered robust retrieval pipelines with prompt engineering, adversarial prompt testing, and explainable evidence trails, ensuring reliability in real-world recruiter workflows
  - Prototyped a WhatsApp recruiter assistant with multilingual speech-to-text (Whisper-style ASR) for conversational candidate search and screening via text and voice notes

Research Projects

- **Sign Language Recognition** ✇ (*April'24*)
  - Developed ASL Recognition Model: Trained a YOLOv8 model to recognize American Sign Language (ASL) gestures using a custom dataset of 350 annotated images across 7 types of gestures
  - Curated Dataset: Created and annotated a dataset consisting of 50 images per gesture to ensure robust training and accurate recognition
  - Evaluation on held-out test set: Precision 0.968, Recall 0.945, demonstrating the model's effectiveness in recognizing ASL gestures
  - Voice to ASL Conversion: Developed an initial solution for converting spoken language into ASL gestures, facilitating seamless communication between spoken English and ASL users
  - Future Enhancements: Planned future work to leverage Generative AI for automating voice-to-sign language conversion, aiming to create a real-time avatar for ASL interpretation

- **ML guided approach for designing precipitation-strengthened aluminum alloys(Bachelor Thesis Project)** (*Aug'23-May'24*)
  - This project involves the optimization of composition of elements using Machine Learning
  - We take alloy factors and screen them using three methods i.e. Correlation Screening, Recursive Feature Elimination, and Exhaustive Screening
  - Screen out alloy factors used as input to build the SVR model for two properties i.e. Hardness and Electrical Conductivity
  - After training multiple model including Random Forest, Bagging Regresson, Decision Tree, Random Forest achieves R2 score of 0.88

Projects

- **Highway Surveillance System** ⬀ *(Jan' 25)*
  - Developed a real-time highway surveillance system using YOLOv11 + DeepSORT to detect, classify, and persistently track vehicles across frames
  - Designed perspective-based speed estimation with dual surveillance zones and robust counting logic to accurately measure vehicle speeds and flows
  - Built an interactive Streamlit dashboard with live video overlay, analytics (counts, vehicle type breakdown, speeds), and performance monitoring for traffic management insights

- **Person Counter** ⬀ *(Nov' 24)*
  - Built a real-time person counting system using YOLOv11 for detection and ByteTrack for multi-object tracking, with support for video streams, webcams, and recorded feeds
  - Designed dual entry/exit counting zones with customizable polygonal areas, enabling accurate flow monitoring in spaces like malls, offices, and public transit stations
  - Implemented a Streamlit-ready pipeline with FPS monitoring and video export, providing actionable analytics for crowd management, facility planning, and safety compliance

- **Deep Research AI Agentic System** ⬀ *(Nov'24)*
  - Developed a multi-agent research system using LangChain, LangGraph, and Tavily for deep online research
  - Designed a supervisor node to dynamically route tasks among research, extraction, LLM, and file management agents
  - Integrated Tavily API to enhance web scraping and research data extraction capabilities.
  - Built an answer drafting agent to summarize collected data into structured responses
  - Implemented file management tools for saving, retrieving, and managing research data locally

- **High-Precision Aerial Image Segmentation with UNet and PyTorch** ⬀ *(April'23)*
  - Developed an Aerial Image Segmentation model using PyTorch that delivered outstanding road segmentation accuracy
  - Utilized cutting-edge deep learning methods, such as the U-Net architecture with 'timm-efficientnet-b0' as the encoder, to tackle the intricate challenge of road segmentation
  - Achieved a precise model through meticulous evaluation, with Train Loss at 0.5181 and Valid Loss at 0.6055, using techniques like Dice Loss and Binary Cross-Entropy Loss

- **Object Detection App** ⬀ *(July'22)*
  - Implemented Faster RCNN algorithm pretrained on COCO dataset for object detection
  - Created a custom filtering function within the threshold range of 0.1-1.0 to eliminate low-confidence predictions
  - Designed a visualization function to draw rectangles and labels around detected objects in images

- **Hand Gesture Controlled Robot:** ⬀ *(July'21-Sep'2021)*
  - Developed a real-time Hand Gesture Recognition algorithm for robot control
  - Controlled the turtlebot3 robot in Gazebo simulation in real-time using hand gestures
  - Libraries used: OpenCV, numpy and rospy in Python3

Technical Skills

Programming: Python (advanced), C++ (beginner), R, SQL
Tool: Git, GitHub, Tableau, Power BI, Streamlit
Libraries & Frameworks: PyTorch, TensorFlow/Keras, scikit-learn, OpenCV & Infra: Pandas, NumPy, PostgreSQL, Docker
Other: ROS, MATLAB (basic)

Scholastic Achievements

- Participated in Flipkart GRiD 5.0– Software Development Track, organized by Flipkart [2023] ⬀
- Engaged in AWS DeepRacer Student's League, modifying reward function of RL Model [2022] ⬀

Positions of Responsibility

- **Event Manager, Axis(Annual Technical fest of VNIT)** *(2023)*
  - Led innovative AI Games event showcasing AI technology in gaming
  - Collaborated with 2 managers and 10 organizers for seamless execution
  - Delivered a successful, engaging, and memorable event

Courses & Certifications

IBM AI Engineering Professional Certifications ⬀	The Data Science Course:Complete Data Science Bootcamp ⬀
Deep Learning Computer Vision ⬀	Introduction to Neural Networks and PyTorch(Honors) ⬀

Extra-Curricular Activities

•**MEMBER OF BLITZKRIEG**(Chess Club of VNIT) •**MEMBER OF IRIDESCENCE CLUB**(Creative Club of VNIT)