Aseem Gupta

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EDUCATION

National Institute of Technology Andhra Pradesh — Tadepalligudem, Andhra Pradesh
*Bachelor of Technology, Biotechnology, **CGPA 8.22*** — *Dec. 2021 – Aug. 2025*

DAV Public School — Asopur, Uttar Pradesh
*Senior Secondary Education, **Percentage 91.1%*** — *Aug. 2018 – May 2020*

EXPERIENCE

AI/ML Engineer — July 2025 – Present
Next Big Innovation Labs — *Bengaluru, Karnataka*

- Engineered a **full-stack Real-Time Quality Control-Dynamic Pressure Regulation (RTQC-DPR)** application for 3D bioprinters, automating the entire calibration-to-print pipeline and **reducing setup time by over 50%**.
- Developed the AI core by training a custom **YOLO keypoint model** on an augmented dataset of over **9,000 images** for vision-based Z-axis measurement, and implementing **Scikit-learn/SciPy** models to generate a 3D compensation mesh for automated bed leveling.
- Built the complete system with a **multithreaded Python backend** for asynchronous **serial communication** (G-code) and a comprehensive **PyQt5** operator dashboard with live video and **Matplotlib** data visualization.
- Gained a foundational knowledge of **Marlin firmware** by troubleshooting the G-code control sequence to successfully implement and refine the automatic bed leveling process.

Summer Research Intern — May 2023 – July 2023
IIT Hyderabad — *Hyderabad, Telangana*

- Developed a **deep learning solution** for quantification of fluorescent dots: Application in **diagnosis of Diabetic retinopathy**.
- Implemented and fine-tuned **YOLOv5 algorithm & custom-trained model** using 500+ microscopic images.
- **Improved accuracy to 94%** by leveraging **data augmentation**, **noise reduction**, **model evaluation metrics** and **image scaling** to enhance feature detection efficiency.

PROJECTS

Toxicity Analysis of Dye | *Python, Machine Learning*

- Developed a **predictive modeling system** integrating **fuzzy logic** for **biosorption efficiency analysis** of toxic dyes using *Trichoderma harzianum*.
- Comparative test using models like **SVR, Random Forest, Decision Tree, XGBoost, and ANN.**
- Achieved a prediction **accuracy of 95%**.

Video RAG Q&A Bot | *Python, RAG, LLMs, VectorDB*

- Engineered an end-to-end **Retrieval-Augmented Generation (RAG)** pipeline to transform any YouTube video into an interactive, queryable knowledge base..
- Built a modular data pipeline using Whisper for accurate transcription, spaCy for Named Entity Recognition (NER), and **Sentence-Transformers to create embeddings**, **indexing** them in a **ChromaDB vector store**.

TECHNICAL SKILLS

Languages: Python (Scikit-learn, Tkinter, PyQt5, PyTorch, Numpy, Pandas, Matplotlib), SQL, JavaScript, HTML/CSS
Frameworks: React, Node.js, WordPress
Developer Tools: Git, Docker, VS Code, Figma
Domains: Computer Vision, Deep Learning, Full-Stack Development, Automation Systems, Data Analysis, MLOPs

EXTRACURRICULARS AND AWARDS

- **Senior Outreach Manager**, **Google Developer Groups 2023**, responsible to secure sponsorships for events.
- **Marketing/Communications & Design Lead, TEDx** NIT Andhra Pradesh 2024.
- **Secretary**, Departmental Technical Students Association BEA 2024-25, responsible for organising events.
- **Project Abstract** published in the conference proceedings of the "4th International Conference on Bioprocess for Sustainable Environment and Energy" 2025.