Abhinav Raj Gupta

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LinkedIn Profile URL • Web Portfolio URL • GitHub

EDUCATION

Texas Tech University, Lubbock, Texas — Expected May 2026
Bachelor of Science in Computer Science — **GPA: 4.0/4.0**
Minor in Mathematics | Minor in Computing Applications for Bioinformatics
Relevant Courses: Data Structure and Algorithm, Software Engineering, Concept of Programming Language

EXPERIENCE

Software Engineer Intern | Part-Time — Summer 2024, June 2025 - Present
Center for Advancing Sustainable and Distributed Fertilizer Production (CASFER**)** — Lubbock, TX

- Engineered CNN-based **object detection system** using **Python, TensorFlow**, and **OpenCV** for automated environmental analysis, improving detection accuracy from **74%** to **88% precision**
- Developed custom instance segmentation model with PyTorch for multi-class particle identification and characterization by shape, size, and color - achieving **81% precision** and **76% recall**
- Optimized image processing pipeline, reducing sample analysis time from **7 hours to under 1 minute** - a **99.8% efficiency** improvement enabling high-throughput data processing

Software Developer | Part-Time — October 2022 – May 2025
Advanced Particle Detector Laboratory (Collaboration with CERN) — Lubbock, TX

- Engineered YOLO-based **deep learning CNN** using Keras and OpenCV for automated defect detection in manufacturing, improving accuracy from **65%** to **98%** and reducing inspection time by **90%**
- Designed and deployed full-stack Django web application with JavaScript frontend across 3 international manufacturing sites (USA, India, China), standardizing quality control workflows and enabling real-time collaboration
- Integrated real-time PyTorch inference engine with performance monitoring dashboards and Unix-based debugging tools, achieving 99.9% system reliability and meeting strict precision tolerance standards

PROJECTS

Movie Ticketing Database | SQL, MySQL | GitHub

- Designed and implemented database system for managing multiple theatres, showtimes, and bookings with real-time seat tracking

Wirebonding Alignment Analyzer | Python, OpenCV, ML | GitHub

- Developed an ML-driven QA system using Hough Circle Transform to detect hole misalignments pre and post wirebonding, reducing shifts within **3µm** range and preventing **68%** of post-bonding defects.

HACKATHON PROJECT: CleanScan | YOLOv5, Flask, JavaScript, HTML, CSS | GitHub

- Achieved **92% mAP** accuracy in real-time waste classification, reducing manual labor by **40%.**

C Compiler Construction | C | GitHub

- Built a lexical analyzer and recursive descent parser, achieving **100% accuracy** in syntactic analysis.

Wine Quality Prediction Using Logistic Regression | Python, Jupyter Notebook | GitHub

- Predicted red wine quality using logistic regression, achieving high accuracy on dataset classification.

TECHNICAL SKILLS

- **Programming:** Python, Java, C, C++, Java, SQL, JavaScript
- **WEB &Tools:** Django, Flask, HTML, CSS, JavaScript
- **Tools:** Git/GitHub, Visual Studio Code, Linux, Jupyter Notebook
- **Deep Learning:** PyTorch, TensorFlow, Keras, CNNs, RNNs, instance segmentation
- **Traditional ML:** Scikit-Learn, logistic regression, clustering (DBSCAN), decision trees
- **Computer Vision:** YOLO, OpenCV, image processing, real-time inference optimization

EXTRACURRICULARS

- **Leadership**: Engineering Senate Rep., Student Govt. Assoc. TTU | Media & Comm. Strategist, Nepal Students' Assoc. TTU, Fundraiser for COVID Crisis, Biomedical Equipment Monitoring (MOT, Nepal)
- **Mentorship**: Mentor for K12, TTU Robotics Club
- **Honors & Awards**: 3x Morrow Eng. Scholarship Winner | TTU Presidential Scholarship | Best UG Research Poster 2023, 2024 | 3x Recipient of TTU Presidential List Honors