ABHINAV RAJ GUPTA

Software Engineering Intern – Technical Automation, Research and Development

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Proficient in Python, C/C++, Linux, and command line, with AWS training and database experience. Proven leader in technical automation and project management. Open to relocation and eager to contribute to innovative projects.

Work Experience

Technical Automation Lead

Oct 2022 - Present

Advanced Particle Detector Laboratory, Texas Tech University | *Lubbock,TX*

Implemented state-of-the-art anomaly detection techniques with YoloV5 and Roboflow, significantly improving the detection capabilities of anomalies in silicon hexa-boards

- Achieved predictive accuracy, precision, and mapping consistently over 98%
- Deployed the trained module across 5 assembly centers in 3 different countries
- Developed a solution adaptable to various assembly environments, ensuring consistent high performance globally.

Student Research Assistant

Jun 2024 - Jul 2024

Center for Advancing Sustainable and Distributed Fertilizer Production (CASFER) | *Lubbock, TX*

Utilized object detection with YOLO to characterize microplastics, their shape and size, in wastewater, achieving high precision and recall while reducing inspection time and costs. Demonstrated significant improvements over manual methods.

- Implemented YOLO algorithm, achieving 94% recall and 95% precision in microplastics detection.
- Reduced manual inspection time from 7 hours (for a 10ml sample) to under a minute using the model.
- Potential for further application in visual microscopy and Raman spectroscopy for microplastics detection and size estimation.

Core Skills

C/C++, YoloV5, Roboflow, Tensorflow, Tinkercad, Visual Studio Code, Linux Terminal, Graphics and Designing : Canva, Adobe Illustrator, Amazon Web Services : Amazon EC2, Community Engagement, Python (Machine Learning), MIT App Inventor, Communication: Social Media Management, Data Mining and Visulaization, Computer Engineering, Collaboration Skills

Education

Texas Tech University

Aug 2022 – December 2025

Bachelor's Degree: Computer Science with minor in Mathematics
GPA 4.0

Publications

Use of Deep Learning-Based Object Detection Technique in Quality Control of Wire Bonds in a Silicon Detector

European Organization for Nuclear Research (CERN)

Applied YOLO-based object detection to automate quality control of wire bonds in silicon detectors for the CMS high granularity calorimeter. Developed a web-based tool to enhance human inspection and support ML-based quality control.