Abhishek Srivastava

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Academic Qualifications

Year	Degree/Certificate	Institute	Performance
2022 - Present	B.Tech, Mechanical Engineering	Indian Institute of Technology Kanpur	7.1/10
2022	CBSE (XII)	Ramagya School, Noida	87.6%
2020	CBSE (X)	Ramagya School, Noida	94.6%

Scholastic Achievements

- Secured AIR **2889** in **JEE Advanced** and AIR **2306** in **JEE Mains** 2022 among **1.027 million** candidates *2022*
- Secured AIR **122** in **NEST** and AIR **387** in **IISER Aptitude Test** 2022 among **22,000+** candidates *2022*

Work Experience

IndusTANTRA | Prof. Nalinaksh S. Vyas | Summer Intern | IIT Kanpur *May'24 - Present*

Objective	• Size estimation of undersized and oversized coal pellets
Approach	• Implemented **YOLOv8** and **UNet2D segmentation model** for detecting oversized and undersized coal pellets • Created a custom labelled image dataset of **3000+** pellets using **OpenCV** and **CVAT** image annotation tool • Used **least-squares fitting approach** on the predicted **probability maps** for accurate circular diameter estimation • Worked out on the camera setup and location in the **on-site steel plant** to capture accurate real time data
Impact	• Developed a system for reduction of repeated processing of the coal pellets by segregating the undersized and oversized pellets

Key Projects

Fault Detection and Classification using Deep Learning | Prof. Nalinaksh S. Vyas | IIT Kanpur *Nov'23 - Feb'24*

- Utilized **vibrational frequency data** from **6** sensors for precise fault detection and classification in rotor bearings
- Redesigned the **CNN architecture**, achieving an **accuracy** of **0.95** in fault detection for real-world applications
- Enhancing neural network interpretability by applying **t-SNE** for visualizing fault segregation
- Built a **Tkinter GUI** allowing users to input custom data and configure CNN model according to specifications given by user

Finment| Self Project | *Jun'24 - July'24*

- Analyzed **5,000+** financial news statements with **FastText** for **End to End sentiment classification**
- Achieved **0.93 precision** and **0.89 recall**, resulting in a highly robust classifier with a response time under **1000ms** per request
- Developed a **Streamlit** web app integrating the ML model with **FastAPI** and **Docker containers** for seamless performance

Autonomous Navigation of Mars Rover | Robotics Club, IIT Kanpur | Summer Project *May'24 - July'24*

- Utilized **Canny edge detection** and **Hough Transform** with **OpenCV** for precise tennis ball detection
- Implemented **YOLOv8** on a custom dataset of **1,500+** annotated images, achieving **0.87 accuracy**
- Estimated the depth of centroids of objects using **RGB depth maps** and **3D point clouds** extracted using **3D ZED Camera**
- Applied **ORB-SLAM library** for **Simultaneous Localization and Mapping on a Mars (SLAM)** terrain simulation

BrainSegmentor | Self Project | *April'24 - Jun'24*

- Analyzed brain MRI scans using the **BraTS-2020** dataset, utilizing **Unet3D** for tumor detection and visualization
- Trained on **1,800+** samples, using custom **tensorflow image generators** and **data loaders** for efficient batch processing
- Achieved an accuracy of **0.98**, **precision** of **0.9852**, **Intersection-Over-Union (IOU)** of **0.77** and **Dice coefficient** as **0.34**

Chirp: Birdsong Recognition | GDSC, IIT Kanpur | Winter Project | *Dec'23 - January'24*

- Extracted the **Mel-Frequency Cepstral Coefficients (MFCCs)** from dataset containing **25000+** audio samples
- Leveraged **transfer learning techniques** for training the well-known **ResNet-50** model on the custom audio data
- Employed the usage of specialized **PyTorch data loaders and generators** for optimal training

Positions of Responsibility

Coordinator | **Robotics Club** *April'24 - Present*

- Managed the budget Worth **INR 2 Lakhs** which was presented to the council and approved by the Senate
- Successfully organized a competition, which saw participation of **30+ students** design and build **four-wheeled, armored sumo bots** featuring two exciting rounds, highlighting the participants' innovation and engineering skills.

Technical Skills

Programming Skills: Python, C, C++	**Frameworks/Libraries:** OpenCV, Numpy, Pandas, Matplotlib, Seaborn, Plotly, Matlab, Pytorch, Tensorflow, Streamlit, Tkinter, Flask, FastAPI
Utilities: MySQL, Docker, Heroku	**Miscellaneous:** Jupyter Notebook, Git, LaTeX

Relevant Courses

***Ongoing**

Dynamics	Theory of Mechanics & Machines	Primary Manufacturing Processes
Introduction to Machine Learning*	Economy, Society & Public Policy	Introduction to Real Analysis