Danushkumar V

Data Scientist

As a B.Tech student in Artificial Intelligence and Data Science, I aim to make significant contributions to the world of AI and computer vision. My expertise in computer vision and analytical skills, along with my dedicated and hardworking nature, make me a valuable asset to any team or project.

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EDUCATION

B.Tech
KPR Institute of Engineering and Technology

06/2020 - Present *Coimbatore, Tamil Nadu*

Course

- Artificial Intellegence & Data Science
- 8.4 CGPA

WORK EXPERIENCE

AI Research Internship
CCMPl, Kyungpook National University

10/2022 - Present *South korea*

Achievements/Tasks

- During this internship, I worked on research projects such as construction site safety surveillance using real-time thermal video analysis, the porosity of building materials detection using CT scan images, Rebar frame equal spacing prediction using instance segmentation, and suspicious activity detection that are help in and around the buildings using CCTV footage & object detection.
- My responsibility is to find the best possible way to resolve the stated problem statement using cutting-edge technologies. Each problem statement has a unique solution using computer vision techniques.
- Tech stack - Tensorflow, Pytorch, OpenCV, Detectron2.

Teaching assistant
CCMPL LAB | KNU

11/2022 - 12/2022 *South korea*

Achievements/Tasks

- I provided assistance and support to students participating in the internship, helping them to learn and develop their skills in the field of artificial intelligence and machine learning.
- Guided students with scikit learn to implement ML algorithms for classification and prediction problems.
- Skill set learned - Interaction with team, Collaboration, Organization.

SKILLS

Python | Java | Linux | Git | Computer vision | Machine learning | Deep Learning | Object detection | NLP | Feature extraction | Adroit team leader

TECH STACK

TensorFlow | Keras | PyTorch | OpenCV | FastAI | Detectron2 | Scikit-image | Pandas | Numpy | Plotly

FEATURED PROJECTS

Identity Authentication Based Log Analysis (09/2021 - 11/2021)

- Face recognition and attendance automation using deep learning.
- With a custom deep CNN architecture, we trained a face detection model with 89.7% mAP, 91.7% precision & 82.0% recall.
- By authenticating the person using facial patterns, in & out logs are fetched using which analysis is done.
- Tech stack - Tensorflow , Steamlit.

Heritage Identification using Deep Learning (03/2022 - 04/2022)

- Identification of Indian monuments using deep learning model (Transfer learning).
- Collection of data from scratch & trained a classification model with 95% accuracy.
- Smart India Hackathon sort listed project.
- Tech stack - Tensorflow , Streamlit .

COVID-19 detection using X-ray | CNN | Grad cam visualization (11/2022 - 12/2022)

- The project uses deep learning techniques, specifically convolutional neural networks (CNNs), to detect COVID-19 in X-ray images with a performance measure of 99.85% precision, 99.76% recall & 99.57% F1 score.
- The project employs gradient-weighted class activation maps (Grad-CAMs) to visualize the features in the X-ray images that the CNN model uses to make predictions.
- The goal of the project is to develop a deep learning model that can accurately detect COVID-19 in X-ray images, potentially improving the speed and accuracy of COVID-19 diagnoses.

WORK EXPERIENCE

Data Analyst
Delphi TVs
06/2022 - 07/2022 *Chennai,Tamil Nadu*
Achievements/Tasks

- The project involves the use of data analysis techniques to analyze a large dataset containing sales data from the past 10 years.
- We made an automated visualizer tool to generate graphs and charts that help to illustrate key trends and patterns in the data, such as changes in sales over time, top-selling products, and regional differences.
- Tech stack - Plotly , Streamlit.

ACHIEVEMENTS

Startup Tenkasi (02/2023 - 03/2023)
Our project won first prize of 1 Lakh at the Startup Tenkasi event, where over 210 projects participated. We had a valuable opportunity to discuss this with Sridhar Vembu, founder of Zoho Corporation.

PSG - Techsonance'23 (02/2023 - 03/2023)
Participated in Techsonance'23 that was held in PSG Institutions, Coimbatore and won 1st prize in Project Presentaion.

Kongu - Repowis'23 (02/2023 - 03/2023)
Participated in Repowis'23 Paper presentation that was held in Kongu Engineering College, Perundrai and won best paper award

Innovesense-22' (05/2022 - 06/2022)
With the Identity authentication project, I lead my team to a victory of 2nd place in the innovesense 22' held in our college

Kaggle 3x Expert (Ranking - 244)
Note book expert - Highest ranking : 402 / Dataset expert - Highest ranking : 244 / Discussion expert - Highest ranking : 458

Kaggle competition participation
I've participated over 28 kaggle competition with top 1% in many competetions.

CERTIFICATES

Kaggle Courses (07/2021 - 09/2021)
Intro to machine learning, Intermediate machine learning, Data Visualization, Intro to Deep Learning, Computer Vision

Neural Networks & Deep Learning (06/2022 - 07/2022)
Learned to build, train, and apply fully connected deep neural networks; implement efficient (vectorized) neural networks.

Machine Learning 101 (03/2021 - 04/2021)
SVM-Building and Tweaking in classification mode Working on Decision Tree module What is Overfitting and how to avoid Overfitting

Foundations: Data, Data, Everywhere (04/2021 - 05/2021)
Organizations need data analysts to improve processes, identify opportunities, launch new products, and make decisions.

LANGUAGES

English
Full Professional Proficiency

Tamil
Native or Bilingual Proficiency

FEATURED PROJECTS

Number Plate Detection and Text Extract (06/2022 - 07/2022)

- Vehicle number plate detection and text extract project.
- Preformance measure (Object detection) - 93.4% mAP, 95.2% precision, 91.5% recall.
- Tech stack - object detection model using tensorflow and TransformerOCR for text extraction.

Colorizing the black and white images (06/2022 - 07/2022)

- Using the concept of auto encoder, built a colonizing model.
- Tech stack - Tensorflow, Streamlit.

RESEARCH WORKS

Object detection
Real-Time Thermal Video Surveillance for Construction Site Safety
05-2022 to Present
This system is designed to improve safety on construction sites by providing real-time monitoring and alerts, enabling timely intervention to prevent accidents or injuries. It utilizes thermal cameras to capture real-time video footage of the construction site and uses deep learning algorithms to analyze this footage in order to detect patterns and trends that could indicate potential safety hazards or incidents. We made a custom object detection model with a optimised parameters. The performance of the model with mAP 96.9%, precision 95.4% & recall 94.4%.

Image processing
Porosity prediction of Construction Materials
12-2022 to Present
We developed a computer vision tool that uses object detection and image thresholding to predict porosity in construction materials. We have implemented a stacked modeling approach to predict the porosity of the materials. It uses an improvised YOLOv8 model for object detection, and an adaptive threshold to the detected material by with poros present in the image can be segmented & calculated. The performance of the material detector is 99.76% mAP, 99.21% precision & 99.4% recall.

Image segmentation
Rebar Frame Spacing Prediction with Instance Segmentation
02-2023 to Present
We aimed to predict equal spacing between rebar frames using instance segmentation. We trained a YOLOv8 model to detect spaces and calculated pixel variations to identify similar and dissimilar spaces. This approach has the potential to significantly streamline and automate the quality control process for rebar frames, ultimately leading to improved construction site safety and efficiency.

Machine Learning
Airfoil self-noise prediction
12-2022 to Present
Airfoil self-noise prediction estimates the amount of noise generated by an air fo il moving through the air. It involves using analytical models, computational fluid dynamics simulations, and wind tunnel testing to design or modify air foils to minimize self-noise and improve aircraft performance. With the help of NASA's self-noise dataset, we have developed a predictive model using the CatBoost algorithm with optimal hyperparameters. MAE - 1.1378, R2 - 0.9414.