Intel® Unnati Industrial Training Project, 2023

REPORT ON:

ROAD OBJECT DETECTION USING DEEP LEARNING

Presented By TEAM UNNATI

AUTHORS:

Krishna Prasad S R (S6 CS dept.)

M Karthik Nair (S6 CS dept.)

OUR GUIDE:

Mr. Jijo Jose

Asst. Prof Dept of EC Department(MBCET)

Mar Baselios College of Engineering and Technology (Autonomous)

Mar Ivanios Vidyanagar

Nalanchira P.O, Thiruvananthapuram,

Kerala, India Pin: 695015

TABLE OF CONTENTS

ABSTRACT:

Road object detection is a critical task in the realm of computer vision, with applications ranging from autonomous driving to traffic surveillance. This report focuses on road object detection using the You Only Look Once (YOLO) deep learning method. The report also examines the training process of YOLO for road object detection.Real-world examples are presented to showcase the effectiveness of YOLO in road object detection. Autonomous driving applications benefit from YOLO's ability to detect and track vehicles, pedestrians, and other relevant objects, enabling safe navigation and collision avoidance. Traffic surveillance systems leverage YOLO for identifying traffic violations, monitoring traffic flow, and enhancing security. Additionally, YOLO proves valuable in pedestrian detection for safety measures, alerting drivers to potential hazards and mitigating accidents.

OBJECTIVE :

Develop a deep learning model based on YOLOv5 to identify cars,bikes,trucks and other vehicles along with pedestrians,animals and sign posts in Indian roads.

FORMAT OF ROAD OBJECT DETECTION:

INPUT:

The dataset collected was IDD_Dataset provided by IIIT Hyderabad and it had a size of 1 GB, the dataset initially had two folders named Images in PNG format and labels. There are also three files train.txt, val.txt and test.txt these contain the path to specific files.

APPROACH:

Training was initially done with the small model configuration having a batch size of 4 and 40 epochs. Using the weights obtained from this training we re-trained on the same dataset using the medium configuration and from the weights obtained from this, we re-trained using the large configuration.

We used a total of 15 labels for training the model. We implemented Validation using the above inputs and labels.We also added a new feature which counts the number of labels present in the demo video input at any given moment and displays them on the output video.

After the training completion,we obtained the maximum precision of 72.9%.

We used random images and videos containing objects in roads for testing the model.They were obtained from sources on the internet.

OUTPUT

The results obtained are contained in the runs folder.The final precision after testing is 0.732 and of that of recall is 0.336.Given below are examples taken from the training set and the validation set.

RESULT: