Pedestrian Detection Using Deep Learning: Report

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1 Introduction

This project focuses on detecting pedestrians in images by utilizing deep learning techniques. The main goal was to build a model that identifies pedestrians and draws bounding boxes around them, adhering to the provided assignment guidelines.

2 Methodology

2.1 Dataset Preparation

The dataset provided consists of pedestrian images with annotations of bounding boxes. These bounding boxes indicate the areas where pedestrians appear in the images. The dataset was unzipped and organized into training and validation sets to facilitate the training process.

2.2 Model Development

A custom deep learning model was implemented using libraries like OpenCV for image processing and Matplotlib for visualizing bounding boxes. A pre-trained deep learning model was used to enhance the accuracy of pedestrian detection by applying transfer learning techniques.

2.3 Bounding Box Visualization

Bounding boxes for detected pedestrians were drawn using OpenCV. The results were visualized using Matplotlib to show the accuracy of the pedestrian detection.

3 Results

The pedestrian detection model was successfully trained, and the visualizations clearly showed the model detecting pedestrians and drawing bounding boxes around them. The model performed well within the scope of the provided dataset and assignment requirements.

4 Challenges

Though I attempted to integrate the **DINO** and **COCO** models into the project, I faced several technical challenges, including:

- **Dependency issues** with setting up DINO and COCO libraries.

- **Model loading errors** while attempting to use DINO for object detection.

- Other **compatibility issues** between libraries, which slowed down progress.

Due to these challenges and time constraints during examinations, I was unable to fully utilize DINO and COCO in this iteration of the project.

5 Future Work

Post-examinations, I plan to revisit this project and integrate DINO and COCO models for more advanced pedestrian detection techniques. This will likely enhance the model's performance by leveraging state-of-the-art object detection methods.

6 Conclusion

This project demonstrates a solid implementation of pedestrian detection using deep learning. The model performs well, but there is scope for improvement by integrating more advanced models like DINO. Despite challenges, this iteration of the project achieves the primary objectives and adheres to the assignment requirements.