Ahmedabad University

Mid sem Report

Group : 4

Course: Computer Vision

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Project: Road markings detection and road measurement in aerial imagery

Group Members

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Abstract:

This report presents a methodology for detecting and classifying road markings using deep learning techniques. The proposed approach utilizes a UNet architecture for semantic segmentation. While the training phase is pending, the anticipated outcomes include the evaluation of model performance using metrics such as loss and Intersection over Union (IOU), as well as qualitative assessments of the model's ability to correctly classify road markings.

Keywords:

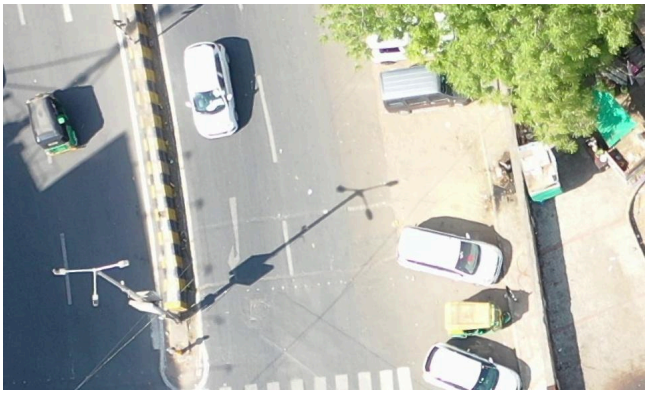
Road Marking Detection, Road Marking Classification, Semantic Segmentation, Deep Learning, UNet, Intersection over Union (IOU).

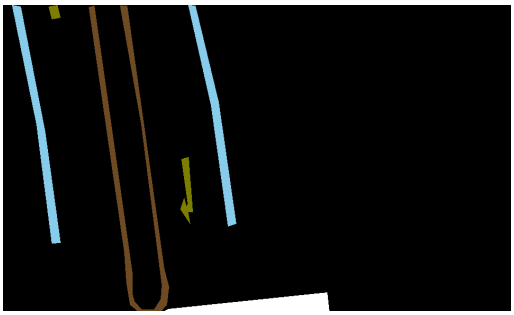
Introduction:

Road markings play a crucial role in ensuring traffic safety and efficiency. Accurate detection and classification of road markings are essential for autonomous driving systems and intelligent transportation systems. In this report, we propose a deep learning-based approach to address the road marking detection and classification problem. We employ a UNet architecture, a popular choice for semantic segmentation tasks, to segment road images and classify different types of road markings.

Methodology:

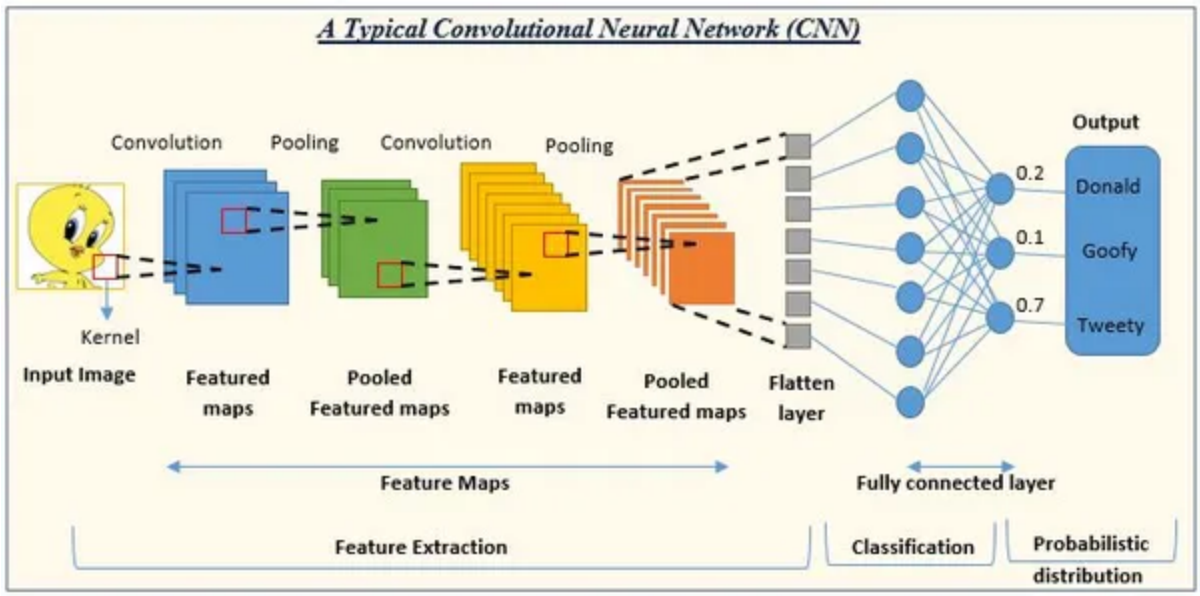
1. Data:
We have a dataset of road images and corresponding masks, where each pixel in the mask represents a specific type of road marking.





2. Data Preprocessing:
We preprocess the data by resizing images and masks, and applying transformations such as normalization and augmentation.

3. Model Architecture:
We use a UNet architecture for semantic segmentation, which consists of an encoder-decoder structure with skip connections.



4. Training:
In the training phase, we aim to train a deep learning model for road marking detection and classification using a UNet architecture. The model will be trained on a dataset consisting of road images and corresponding masks, where each pixel in the mask represents a specific type of road marking. The model will be trained using a combination of pixel-wise Dice Loss and Adam optimizer. The training process involves iterating over the dataset and updating the model parameters to minimize the loss function.

Results

In the results section, we will present the outcomes of training the model, including performance metrics and qualitative assessments.

Conclusion

In conclusion, this report outlines the methodology for training a deep learning model for road marking detection and classification using a UNet architecture. While the training phase is yet to be performed, we anticipate that the proposed approach will yield promising results based on the established effectiveness of the UNet model in semantic segmentation tasks.

Upon completion of the training phase, we will analyze the performance metrics and qualitative assessments to evaluate the model's accuracy and effectiveness in detecting and classifying road markings. The outcomes of this study have the potential to contribute to advancements in autonomous driving systems and intelligent transportation systems, ultimately enhancing road safety and efficiency.

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