

Project - Lane Segmentation for Self-Driving Systems

What we will be covering in this module?

- Introduction to Image Segmentation
- How to solve Image Segmentation problems?
- Approaches for Image Segmentation
 - Use Traditional Methods
 - Leverage Deep Learning
- Understanding Deep Learning Architectures for Image Segmentation
- Project on Lane Segmentation for Self Driving Cars
- What's Next?

Overview of Business Problem

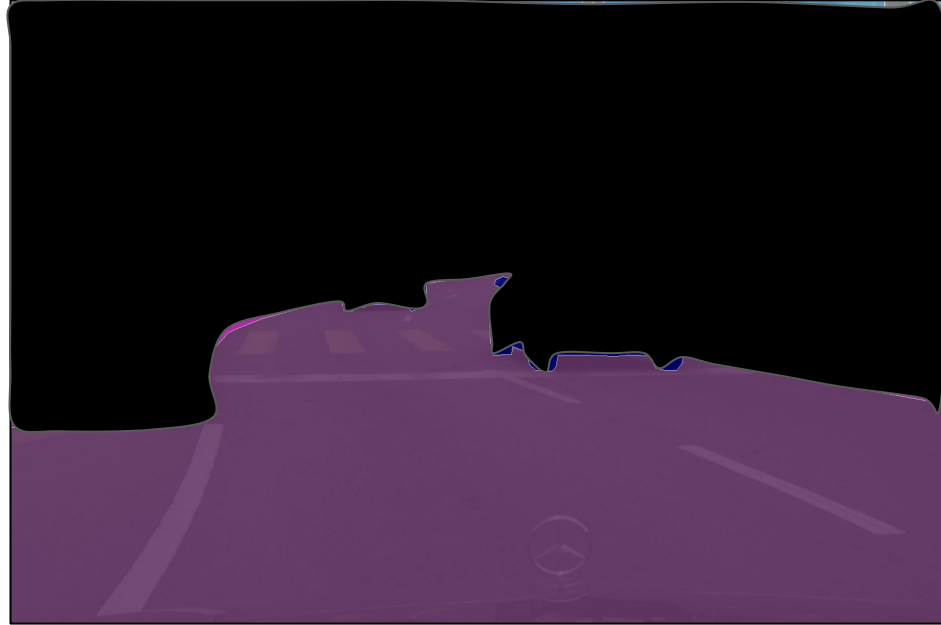


Overview of Data Science Problem



Source: Marius Cordts et al: "The Cityscapes Dataset for Semantic Urban Scene Understanding", 2016

Lane Segmentation problem



Source: Marius Cordts et al: "The Cityscapes Dataset for Semantic Urban Scene Understanding", 2016

Evaluation Metrics for Image Segmentation

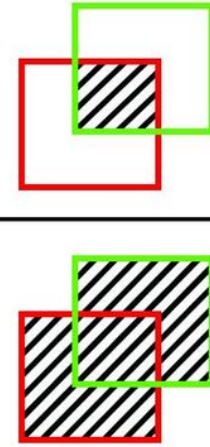
- IoU

- Pixelwise Accuracy

IoU =

Area of Intersection

Area of Union



Evaluation Metrics for Image Segmentation

- IoU

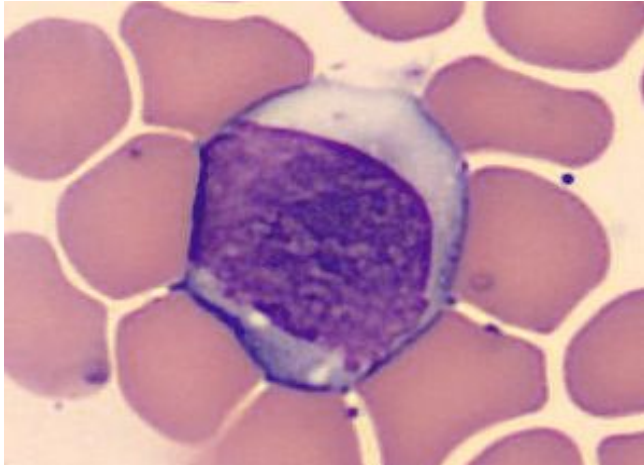
Number of correct predictions

Accuracy =

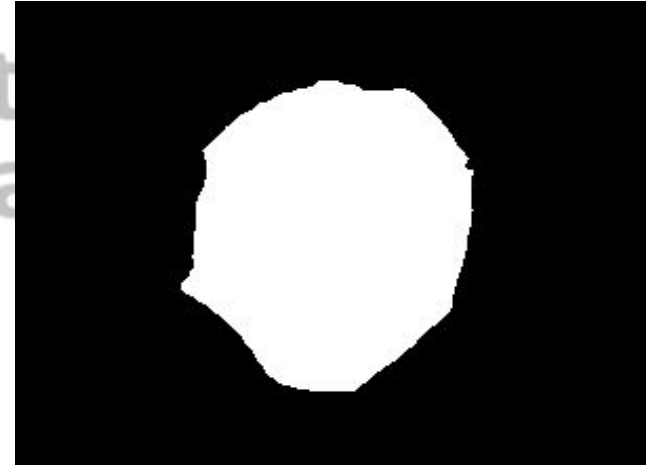
—————
Total Number of values

- Pixelwise Accuracy

Approach to solve Lane Segmentation



Advanced
Deep Learning



Loss Functions to Train DL Models

- Binary Cross Entropy
- Dice Loss



Loss Functions to Train DL Models

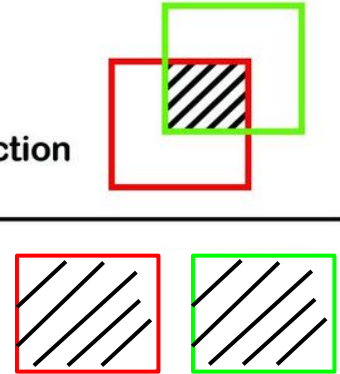
- Binary Cross Entropy

- Dice Score

Dice Score

$2 \times \text{Area of Intersection}$

Total Area





Thank you

Project - Lane Segmentation for Self-Driving Systems

Steps to Solve Lane Segmentation - FCN model

1. Data Loading and Preprocessing

1.1 Load the Data

1.2 Define custom dataset

1.3 Data Exploration

2. Lane Segmentation using FCN

2.1 Define model architecture

2.2 Train the model

2.3 Calculate IoU score



Code Walkthrough of Lane Segmentation using FCN

