

AUTONOMOUS CAR STARTING CODE PLANNING

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ABSTRACT

This document presents our team's procedure to create the baseline model code for an autonomous self-driving car. ...

1 SETTING UP THE ENIRONMENT

1.1 INSTALLING CARLA

1.2 INSTALLING ANACONDA

2 DATA COLLECTION

2.1 CREATING THE DATA COLLECTION SCRIPT

In CARLA, there are already cars which have an autonomous functionality. We can create data a RGB Camera Sensor attached to this car, while it drives around a designated map. Additionally, we will have ground truth values for the steering angles, allowing us to create a model that can predict the steering angle based on the camera feed.

Procedure:

1. Spawn in a vehicle
2. Attach an RGB Camera Sensor (front-facing) to the dash of the car.
3. Collect image data (20 fps) and steering values for the car.

2.2 COLLECTING DATA IN STABLE CONDITIONS

Data will be collected without traffic in the roads (i.e no pedestrians or cars on the road). The car would have a constant speed and the camera will always be mounted in the same position and angle at the front of the car. The FPS will be set to a constant 20 FPS. We will use the CARLA's autopilot to gain the steering values necessary to be used as ground truth labels. To get a diverse set of data, we will collect data in different maps and weather conditions.

2.3 CLEANING THE DATA AND SAVING DATASET

To ensure the data is clean, we will remove any images that are all black (indicated by the small file size)

3 CREATING BASELINE MODEL

3.1 BUILDING THE MODEL

3.2 EVALUATING THE MODEL

4 TRAINING NEURAL NETOWRK

*Quantitative Results: Training Loss (MSE) and Validation Loss

4.1 MODEL TRAINING SCRIPT

4.2 LOGGING

4.3 OUTPUTTING RESULTS

5 EVALUATING WITH INFERENCE

*Qualitative Results: Using model for actual driving in CARLA

5.1 RUNNING MODEL IN CARLA USING LIVE CAMERA FEED