CSC2515 Project Proposal
Autonomous Driving: Road-Estimation

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1 Project Overview

The project we propose consists of a comparison of classification algorithms in their ability to accurately classsify what is road and non-road in the autonomous driving: road estimation suggested topic [**?**]. The dataset is the base kit of the road/lane detection evaluation of the KITTI dataset, described in further detail below. As suggested in [**?**], the training data will be split into 60% for training, 10% for validation, and 30% for testing, and preprocessed to conduct the classification on superpixels. The algorithms used for comparison are discussed below, and will be compared in false-positive and false-negative error rates.

2 Dataset

The data used in this project is provided by the KITTI Vision Benchmarking Suite[1] which is widely used in robotics for testing machine learning algorithms. The Road/Lane Detection Evaluation (2013) dataset contains images (pixel color intensity) of urban scenes taken from the top of a vehicle, which ground truth labels for roads. There are three different scene categories, as seen in figure 1:

- urban unmarked roads (uu),

- urban marked roads (um),

- urban roads with multiple marked lanes (umm),

each with roughly 100 training images and 100 test images. The main dataset used will be the urban
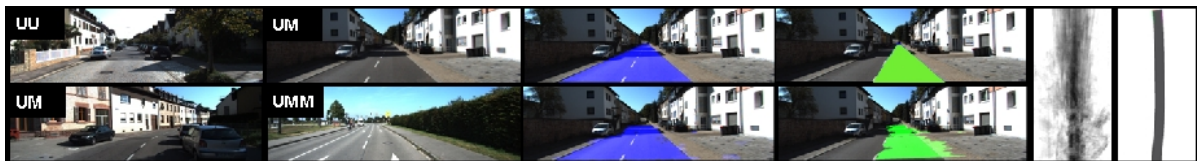

Figure 1: Example of the different scenes in this KITTI dataset with road labels.

marked road dataset as project focuses road estimation and not individual lanes. A possible extension to this project would be to analyze the impact of scene type by evaluating performance on all datasets individually, then combining them.

3 Algorithms

- *k*-means

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[1]http://www.cvlibs.net/datasets/kitti/

- k-Nearest Neighbours

- Support Vector Machines

4   References