

ED3S: MACHINE LEARNING PROJECT

Image classification with PASCAL VOC dataset

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1 Definition

1.1 Project Overview

The problem that I have chosen for my project is the object classification task using the Pascal VOC dataset. For the sake of time I focus on building an animal classifier with five object categories; person, dog, cat, horse and other. I will outline the architecture of the implemented deep-neural network that I trained for this purpose, and discuss the data preprocessing.

This particular problem is important to solve because it was numerous real-world applications. For example, self-driving cars use sophisticated algorithms and equipment to map out their environment, in order to take appropriate actions on the road, these cars need algorithms that can classify objects on-the-fly. If the classifier detects animals on the road, it will behave differently depending on the type of animal identified. Small animals, like cats and dogs may have a tendency to run into the road unexpectedly and so the car will drive more carefully than when the animals it identified were horses or humans which are less prone to running onto the road. Of course the usefulness of this type of classifier is not limited to self-driving cars and can be used in other applications, which make this problem useful and important to solve.

The PASCAL VOC dataset contains X pictures, with Y object categories in total. The five categories that I have chosen are a subset

The goal for this image classifier, in the case of the self-driving car example, would be for the self-driving vehicle to supply images via its cameras to the classifier, which will then return the object category to the vehicle on the fly. The algorithms in the vehicles computer system would then take the appropriate actions based on the results. However, in general

2 Analysis

2.1 Data Exploration

2.2 Algorithms and Techniques

3 Methodology

3.1 Data Preprocessing

testing

For this project, I took a subset of the original PASCAL VOC data set. I used 100 images for the first four categories, and 300 images for the “other” category.

4 Results

References

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