Classifying images of cars by brand

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COM322 Final project

The goal of this project was to build models to classify images of the fronts of cars by brand (Ford, Nissian, Honda, or Toyota). I was able to build three different models which all had varying levels of accuracy.

Files

BOF_main.m

In this file, I created a model using the data collected from bag of features and used the classification learner to train an SVM. The type of SVM I picked was the Medium Gaussian SVM becasue it had the highest accuracy when trying to predict the training set (between 80% and 85%). However, when this model tried to predict the test set, it's accuracy decreased dramatically to only around 25%.

BOF2_main.m

In this file, I created a model using data collected from bag of features and used the Matlab `trainImageCategoryClassifier()` method to train the model. This was a much higher-level approach and it produced better results. The model's accuracy when trying to predict the training set was about 85%. When trying to predict the test set, the model was able to get between 80% and 85% accuracy which is much better than the previous model.

HOG_main.m

In this file, I created a model using data collected from HOG features and I used the `fitceco()` method to create a multiclass model. This model was much better than previous models. The model was able top The model's accuracy when predicting the training set was between 95% and 100%. The model's accuracy when predicting the test set was consistantly above 95% which greatly out performs the previous models.

Dataset: https://deepvisualmarketing.github.io/

The dataset I used was from the "confirmed fronts" dataset from this site. it was a huge dataset which was already labeled and had the background removed from each photo. The dataset contained

20+ car brands each with varying amounts of images.

Images per class

Ford: 3436

Honda: 1303

Nissan: 2384

Toyota: 1776

Heres an example below