

Task Description

The project is to create classifier for fruits and vegetables. There is given subset of fruits and vegetables: orange, apple, watermelon, cauliflower, broccoli. Additionally there is one more class describing not known objects. Classifier will give an answer of the type of the object on the input and will also be able to tell if it is an object not from the given list of learned objects.

Proposed solution

In order to solve the given problem the following solution was proposed: Features will be extracted from images via SIFT algorithm. Later features will be added to Bag of Words. Finally images will be classified using Support Vector Machine.

Final program

The proposed solution was implemented exactly as it was proposed in the preliminary report. From the given subset of fruits watermelon was removed, because this class was completely not recognized correctly. For the other classes it is visible that classifier works, even though the accuracy is far from perfection.

Testing Images Selection

Due to lack of prepared dataset of already tagged fruits and vegetables imaged, images were gathered from www.image-net.org and www.google.com and thoroughly checked. Then they were divided into six classes: orange, apple, cauliflower, broccoli, other. In total only 307 images were qualified to be train data, and 146 images for test purposes. Most of the data is the class "other" which were taken from MIT Objects 101 dataset.

Example Results

Result Analysis

FAR/FRR + ROC curve
CMC curve

3) results analysis Analysis of obtained results, with some comments regarding negative results Also, include some statistical analysis of your results. Do not forget to write few words about your dataset - how many pictures there was, how many positive/negative samples for each class etc. More info: <https://docs.google.com/document/d/1gcIEGj0NrPgZ3fMfE83-fMdeVYtTt-4HO3JS4uGGi2Y/edit?usp=sharing>



(a) Apple classified as apple



(b) Apple as classified cauliflower

Figure 1: Example of apple classification.



(a) Broccoli classified as broccoli



(b) Broccoli as classified apple

Figure 2: Example of broccoli classification.



(a) Cauliflower classified as cauliflower



(b) Cauliflower as classified other

Figure 3: Example of cauliflower classification.



(a) Orange classified as orange



(b) Orange as classified apple

Figure 4: Example of orange classification.



(a) Other classified as other



(b) Other as classified apple

Figure 5: Example of other classification.

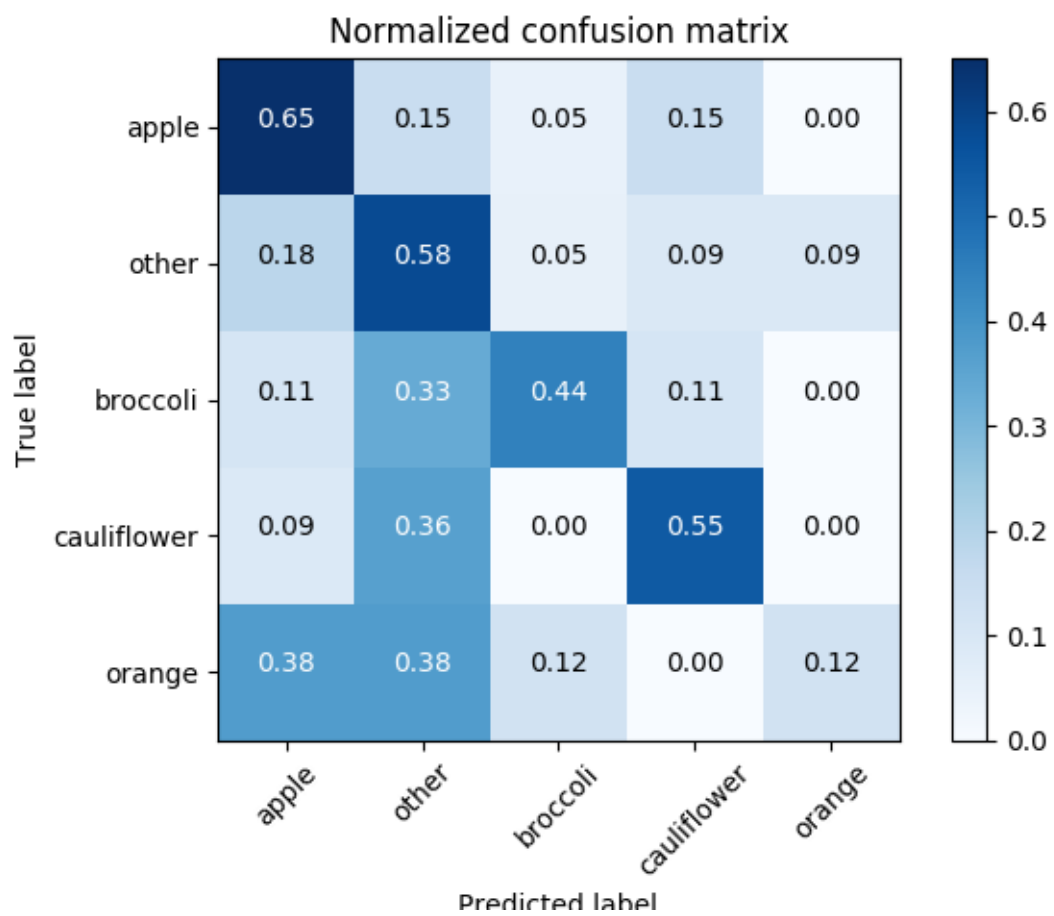


Figure 6: Confusion Matrix