



FAKULTÄT FÜR
INFORMATIK

Selected Topics in Image Understanding

Project Presentation 1

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Project Setup

- Using **Anaconda** as environment (**Python**)
- Using **OpenCV** & **Scikit-learn**
- Using **Git** for sharing code



Data organization:

- Divide each image folder into 10 subfolders to allow 10-fold cross-validation
- Alternative: Use `cross_val_score()` function provided by scikit-learn library

Features

Features we plan on using:

- Edges
- Corners
- Homogeneous Regions

Features we do not plan on using:

- Color
- Object specific size

General Approach

- HoG & ORB filter for feature vector generation
- Dimensionality reduction of the feature space via PCA (figure 1)
- Classification via Support Vector Machine (figure 2)

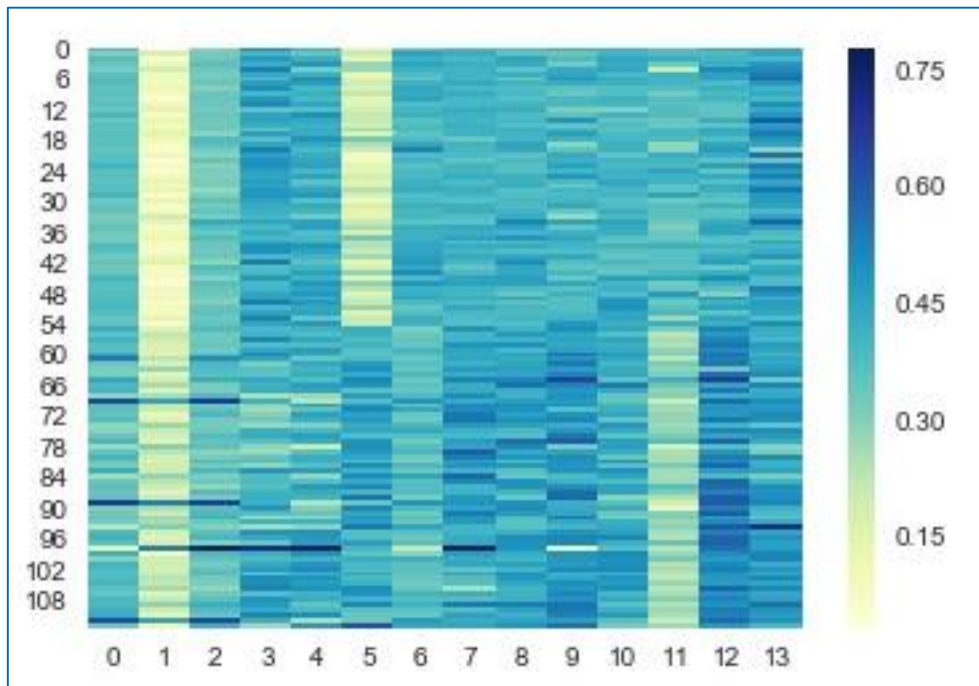


Figure 1: Example feature vectors for two categories

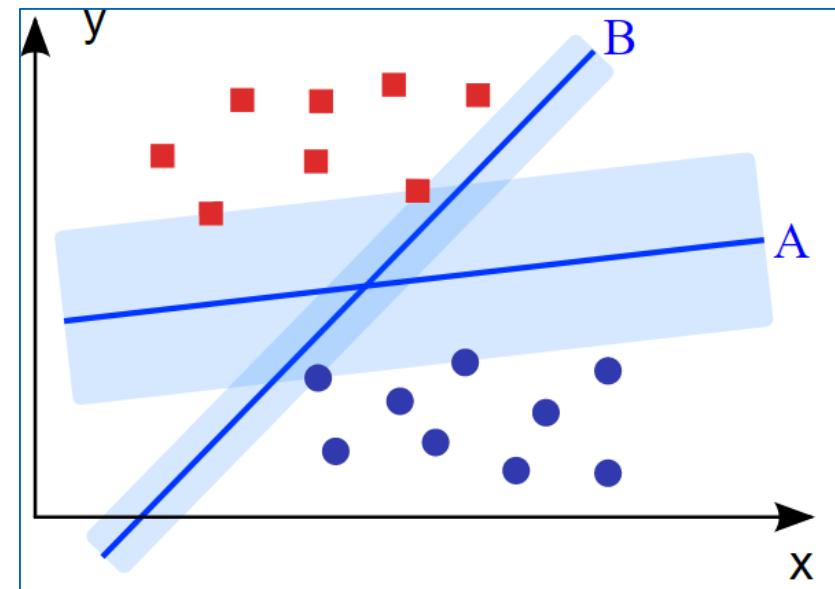


Figure 2: Concept of linear SVM, image taken from Wikipedia

Results (so far)

- Accuracy: 50% (mean value calculated with 10-fold cross-validation provided by python library scikit-learn)

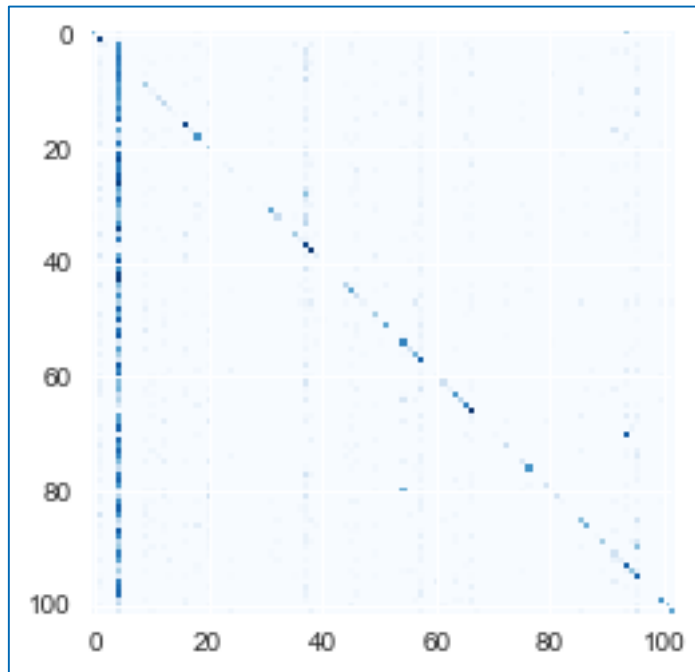


Figure 3: Confusion matrix using unbalanced SVM

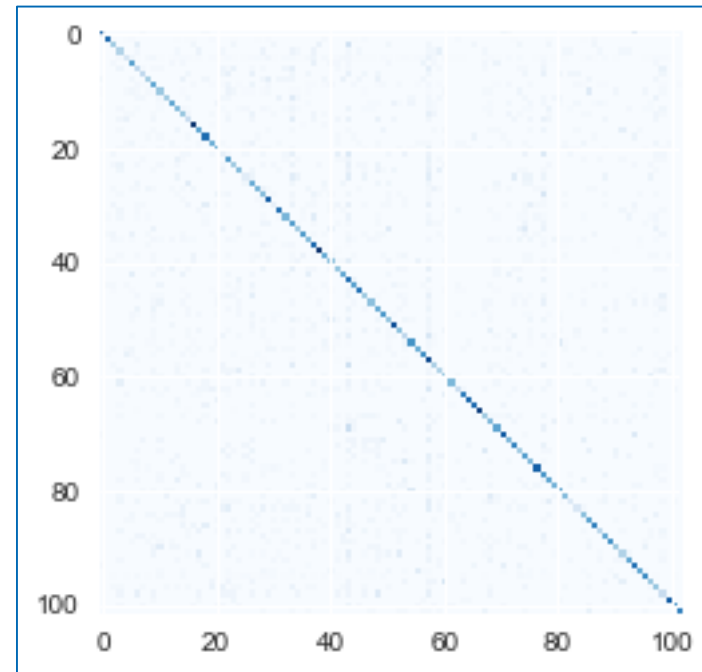


Figure 4: Confusion matrix using balanced SVM

Problems

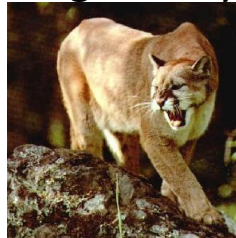
- Different image classes are not balanced
- Images are of different size (scaling needed)
- Images from different image classes can be really similar
- Category „BACKGROUND_Google“ is hard to predict

Cougar Face



VS.

Cougar body



Flamingo Head



VS.

Flamingo

