# Texton Histograms for Image Classification

Javier Perez
Universidad de los Andes
Bogota, Colombia
je.perezl@uniandes.edu.co

## 1. Introduction

## 2. Materials and Methods

We worked with CIFAR-10 dataset [1]. This dataset consists of tiny images of 10 different classes : airplane, automobile, bird, cat, deer, dog, frog, horse, ship and truck. All the size of the images are 32x32x3. The dataset is divided into 5 batches for the training images and the test batch. We choose to work with the third batch because it is almost balanced between the classes.

We create 32 filters that formed the filter bank. The filter are x. We used the same number of images for the 10 classes, and we modified this value several times. This was done to avoid misclassification. After that, we obtained the responds of all the images to the 32 filters. The images were concatenated.

Then, we compute the textons an the texton map based on the filter resoponses, in the case we set a parameter k, that corresponded to the number of cluster in the k-means. The parameter was varied. Next, we assigned the corresponding texton to each pixel of all the images. Finally, we obtained the texton histogram from each image.

With the texton histograms of the used training images, we train two classifiers: k-Nearest Neighbor (kNN) and Random Forest (RF). For the kNN we used the intersection metric. We tested our methods with all the test images (10000 images). Finally, we got the Normalized Confusion Matrix for the kNN and RF classifiers.

## 3. Results

## 4. Conclusions

## References

[1] A. Krizhevsky, "Learning multiple layers of features from tiny images," tech. rep., 2009.

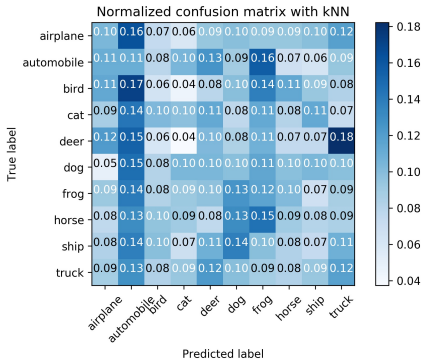


Figure 1. Confusion matrix kNN with k=16

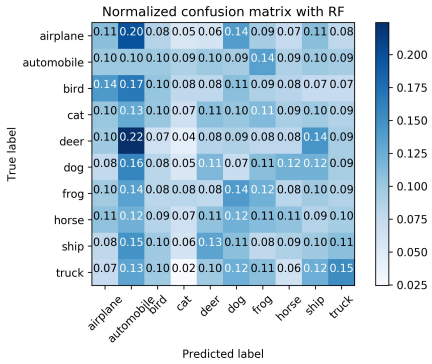


Figure 2. Confusion matrix RF with k=16

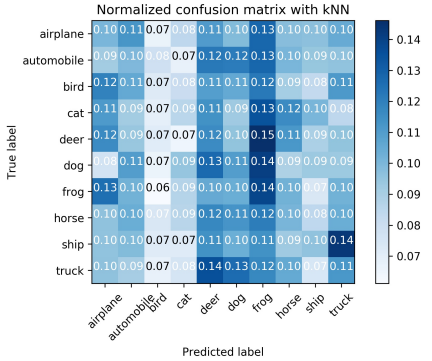


Figure 3. Confusion matrix kNN with k=64