10-601b: Mid-term report

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Abstract

In this report, we list the results we've achieved for classifying the subset of the CIFAR-10 dataset. We use the K-nearest neighbours and SVM to achieve an accuracy of X% and Y% respectively.

1 Introduction

- The problem statement
- The Cifar-10 dataset
- Our approaches

2 Exploratory data analysis

- How we intend to test our results
- Distribution of the various labels
- Color variance of the dataset
- Average image of each label class
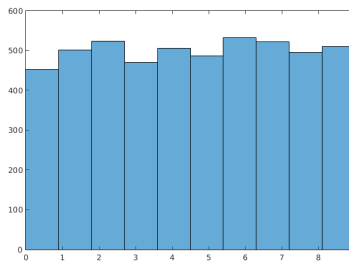- Average HOG in each label class

Figure 1: Distribution of the ground truth labels

3 Classification with K-means and K-Nearest Neighbours

3.1 K-Means

- K-means on raw images

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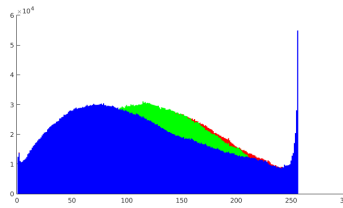096
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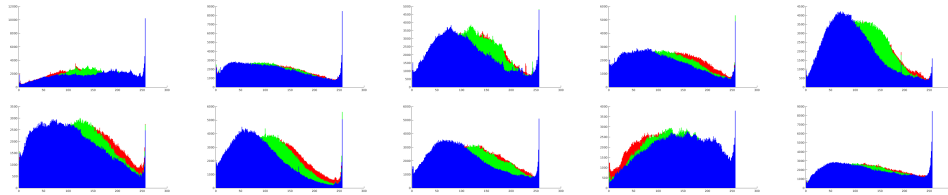Figure 2: Distribution of RGB across all 5000 images

Figure 3: RGB histogram for each class

- K-means on filtered images (filter banks, gabor filters)
- K-means speed as the number of clusters increase

3.2 K-Nearest Neighbours

- Given the terrible training speed
- Using filtered images
- Classification speed
- Switching to HOG classifiers

3.3 Results

4 Support vector machines

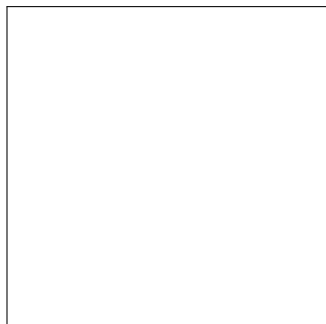- The outline goes here?
- More outline here

4.1 Results

Figure 4: Sample figure caption.

Table 1: Sample table title

PART	DESCRIPTION
Dendrite	Input terminal
Axon	Output terminal
Soma	Cell body (contains cell nucleus)

Acknowledgments

References

References follow the acknowledgments. Use unnumbered third level heading for the references. Any choice of citation style is acceptable as long as you are consistent. It is permissible to reduce the font size to 'small' (9-point) when listing the references. **Remember that this year you can use a ninth page as long as it contains *only* cited references.**

[1] Alexander, J.A. & Mozer, M.C. (1995) Template-based algorithms for connectionist rule extraction. In G. Tesauro, D. S. Touretzky and T.K. Leen (eds.), *Advances in Neural Information Processing Systems 7*, pp. 609-616. Cambridge, MA: MIT Press.

[2] Bower, J.M. & Beeman, D. (1995) *The Book of GENESIS: Exploring Realistic Neural Models with the GEneral NEural SImulation System.* New York: TELOS/Springer-Verlag.

[3] Hasselmo, M.E., Schnell, E. & Barkai, E. (1995) Dynamics of learning and recall at excitatory recurrent synapses and cholinergic modulation in rat hippocampal region CA3. *Journal of Neuroscience* **15**(7):5249-5262.