Flowers Classification using CNN

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**Background:**

We plan to solve the flower classification problem, unlike other obvious objects classification, classification about flowers is a complicated task, because it’s involved in certain problems like similarity and variation. It’s obvious that there’s no same flowers all over the world. In addition, it is tricky to distinguish certain types of differences that are similar in appearance. Besides, samples are usually taken in real environments with different lighting from time to time. Also, the point of view, occlusion, flower image ratio and background will have more changes.

**Literature review:**

All references are at the end of this proposal. In [1] [2], Zisserman and Nils-back made a classification system by using visual vocabularies. In [3], Guru adopted a flower classification system by using KNN classifiers. In [4], SIFT features and feature contexts methods can encode different kinds of information like local and spatial, and classification part is solved by SVM. Kanan and Cottrell [5] designed a model using combination sequential visual attention using gaze and sparse coding.

**Plan:**

In this project, we plan to implement three series experiments to check different techniques’ effect on the above limitations. Firstly, we use the dataset to train and test different VGG networks, to figure out which one has the best performance on The Oxford 102. Secondly, we choose the VGG 11 network to study the impact of learning rate, ranging from 0.001 to 0.05. At last, we set VGG 11 with 0.001 learning rate as a baseline, and compare it with our own simple CNN to learn how our simple CNN performance is. For the above three experiments, we use two factors, accuracy and time to justify the performance of each network.

**Dataset:**

https://www.robots.ox.ac.uk/~vgg/data/flowers/102/

This dataset has 102 different flowers. Every kind of flower has 40 to 258 pictures.

**Reference:**

[1] M. Nilsback and A. Zisserman, ”A Visual Vocabulary for Flower Classification,” 2006 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 06), New York, NY, USA, 2006, pp. 1447-1454.

[2] M. Nilsback and A. Zisserman, ”Automated Flower Classification over a Large Number of Classes,” 2008 Sixth Indian Conference on Computer Vision, Graphics Image Processing,

Bhubaneswar, 2008, pp. 722-729.

[3] D.S.Guru, Y.H.Sharath, and S. Manjunath. “ Texture features and KNN in classification of flower images”, IJCA Special Issue on Recent Trends in Image Processing and Pattern Recognition (PTTIPPR), Vol. 1, pp. 2129, 2010.

[4] Wenjing Qi, Xue Liu, and Jing zhao. Flower classification based on local and spatial visual cues. In CSAE, pages 670-674, 2012.

[5] C. Kanan, G. Cottrell. Robust classification of objects, faces, and flowers using natural image statistics. In Computer Vision and Pattern Recognition (CVPR), 2010 IEEE Conference on, pages 2472-2479, 2010.