Computer Vision Course Project

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1 Project Summary

We want to create an app that produces the name of a tree after being provided a picture of one of its leaves. Some algorithms we were considering that were listed in the paper we found about a similar project were: Support Vector Machines for Classification, Expectation-Maximization for Segmentation.

One expected challenge is that of leaf damage/warping. Since the leaf's shape is important to it's classification, any shape-changing damage could affect the accuracy of our program. Another challenge is the similarity of leaves between some types of trees, for instance maple and sycamore or parsley and cilantro, which are difficult even for humans to tell apart. It will be useful during testing to measure precision/recall accuracy using a confusion matrix, to help see whether or not we are accounting for some of these challenges correctly.

2 Reasons for Picking the Project

Identifying leaves presents challenges that, when overcome, will enable us to identify other objects in future work. Leaf image databases will be widely available, allowing for a more comprehensive dataset. Research on the subject is available for reference and results comparison. Since leaves themselves are so readily available, it's also quite easy to work with real-world data. And in addition, since they're easy to damage, it's trivial to test the effectiveness of our algorithms on different qualities of leaves.

If we are successful, it would also be a useful product for real life use, and would make a good candidate for a phone app. Especially considering that the paper we found on the subject is based around the implementation behind an app that has already been developed (and since the existing one has poor reviews and is only available on iPhones).

3 Additional Implementation References

http://neerajkumar.org/papers/nk_eccv2012_leafsnap.pdf

4 Team Website

http://bmw9052.wix.com/leafcategorization