Private Eye: An ANN Computer Vision API

Report Name	Outline Project Specification
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1 Project description

This project is concerned with the use of deep neural networks for computer vision tasks. There is a number of proposed datasets that can be used in this project. Including medical imagery from scans, banks of pictures mined from websites as well as artwork. The exact specification here is subject to change as we investigate applications for our neural network and focus on particular interesting problems over the first few weeks of this project.

The task will likely inveolve a report centered around comparing performance of convolutional neural networks for a variety of vision tasks as well as a demonstration of our final neural network with some interesting simple applications as a proof of concept.

2 Proposed tasks

Investigate available APIs for the implementation of deep neural networks, and how to structure my neural network for the proposed project. This will likely involve Google's TensorFlow framework and Convolutional Neural networks. Some other considerations are Theano and Keras for this purpose or a combination of these. Some of our data will already have been used as part of papers with other machine learning or computer vision methods so part of the task might involve comparing our solution's performance against other mainstream computer vision methodologies.

We will scale up our datasets through continuous itteration starting with simple problems like handwriting recognition moving on to more complex tasks as time allows.

Write a report on the effort undertaken during this project and experimental results including benchmarking against existing solutions where possible.

3 Project deliverables

A neural network implementation for computer vision either used for feature extraction or used for image classification.

An API for developing applications using our neural network will be developed to enable us to demonstrate the project. Some demos will also need to be delivered, probaly involving simple websites or even possibly file search plugins for searching through image albums.

A detailed report about the project including documentation of decisions taken during the project, as well as performance and test data for the solution.

Annotated Bibliography

[1] R. N. Keiron O'Shea, "An introduction to convolutional neural networks," *arXivaij*, vol. 1511.08458, 2015.

Helpful primer into convolutional neural networks

[2] Various, "Tensor flow," https://www.tensorflow.org/, Feb. 2016, accessed February 2016.

Site for Google's Tensor Flow machine learning framework