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Final Project Topic Proposal

For the final project, our group will build a neural network to recognize facial expressions of a portrait photo: “happiness, sadness, fear, anger, surprise, disgust, and neutrality” ([2000] A six-unit network is all you need to discover happiness). We got inspired by the four papers listed in the References. The framework we are going to use is Torch 7. For data, we will either ask the authors of the cited papers or collect a dataset by ourselves. One paper referenced a dataset available from Yale University (the Yale Face Database).

The goal of this project is to have a hands on experience with Machine Learning and Artificial Neural Networks. Beating the results that the previous authors have achieved is not our first priority; instead, we will try different neural network configurations to see how they work and to compare their performances. Based on the architecture proposed by the other authors, we will try to build most of the learning system by ourselves. Our final deliverable will be our codebase with our facial expression recognition system, along with some sample data (photos of different facial expressions) and what our system categorized them as.

References

A Neural Network Facial Expression Recognition System using Unsupervised Local Processing
http://ieeexplore.ieee.org.proxy.seattleu.edu/stamp/stamp.jsp?tp=&arnumber=938703

Recognition of Facial Expression Using Centroid Neural Network
http://ieeexplore.ieee.org.proxy.seattleu.edu/stamp/stamp.jsp?tp=&arnumber=5616993

[2000] A six-unit network is all you need to discover happiness
https://redhawks-my.sharepoint.com/personal/tranh14_seattleu_edu/_layouts/15/guestaccess.aspx?guestaccesstoken=bu3wcZUF8VtC9ejNa5vyzTU0LO06xcnIi8RIsIoUIpA%3d&docid=024586566203f48629a1dadbc0c16ba2b

This is a good reference but their algorithm is very expensive computationally
Facial Expression Recognition Using 3D Convolutional Neural Network:
http://thesai.org/Downloads/Volume5No12/Paper_15-Facial_Expression_Recognition_Using_3D.pdf