ERIN AND VIVIAN'S FINAL ADVENTURE:

FACIAL EXPRESSION RECOGNITION

CS 152 – Neural Networks

Fall 2012

PROBLEM STATEMENT:

Looking for someone is no longer a task in Facebook – Facebook has automated the process.  Even an iPhone can recognize faces, but what about detecting a person's emotions? This is something which many humans struggle with, as it requires a deep knowledge base of the signs of a particular emotion. So how could a computer do it? Neural Networks! We plan on using several databases of faces to build our network's knowledge and using these databases to train a network using backpropagation.  Additionally, we may implement a fuzzy logic network that also uses HSV values to recognize skin vs. non-skin.  We believe that this will improve the face recognition abilities as well as the emotion recognition since we would be able to categorize faces based on race and thus utilize our knowledge of variations in facial structures of different races.

As a first step, we will extract facial features from an image consisting of only a face. Then, we will match these features to our database of different emotions to determine which emotion the image corresponds to. If time allows, we will also be implementing a facial identifier for images, in which a face can be extracted from image, such as those from Facebook. Finally, we will link these two components to be better than Facebook (so we can get a job at Facebook after we graduate).

METHOD:

Facial Alignment (MLP)

Feature extraction (math time)

Facial Matching (MLP)

PROGRESS:

11/11: We created the website you are now looking at. We also researched more about the methods available in MATLAB and which neural networks will be most helpful to our project.

FINAL REPORT:

SOURCE CODE:

RESOURCES:

* CMU Database

<http://www.cs.cmu.edu/afs/cs.cmu.edu/usr/mitchell/ftp/faces.html>

* Journal article on an implementation of face recognition

<http://www.hindawi.com/journals/aans/2011/673016/>

* Face recognition using fuzzy logic and HSV

<http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=5698324&contentType=Conference+Publications>

* Facial recognition using neurofuzzy network

<http://www.sciencedirect.com/science/article/pii/S0893608005000377>

* Similarity-based neural network for facial recognition across races

<http://www.sciencedirect.com/science/article/pii/S0167865507000220>

* Human emotional state- using 3-D modeling

<http://www.sciencedirect.com/science/article/pii/S0031320312003421>