Introduction

- Human emotion is complex. We express emotions in a variety of ways. Humans also develop emotional detection models to try to detect the cues they are seeing. These models are built over the entirety of their lifetimes.
- We are seeking to build models that can understand human emotional cues delivered through facial expressions.

Dataset

- Since 2000, researchers at Carnegie Mellon University (CMU) have been exploring algorithm development and evaluation of emotion detection through facial expressions. The team sought to build a robust database on which to perform comparative analysis of different predictive approaches. They realized a need to have a training set that spanned the gamut of expressions and emotions. To this end, CMU built an interdisciplinary team across psychology and computer sciences to build such a database through experiments in both 2000 and 2010.
- The dataset we will use is comprised of 593 image sequences from 123 subjects. Subjects were given instructions to perform a facial display associated with one of seven emotions. These emotions were: Anger, Contempt, Disgust, Fear, Happy, Sadness and Surprise. Each image sequence started and ended with the subject in a neutral emotion state, with images capturing the subject working to and away from the "peak" emotion image.

Modeling

- We will use a CNN architecture implemented with the Keras framework. This architecture and framework appear to be robust for all manner of image recognition tasks. Keras has a simplified modeling paradigm. It also has a wide array of additional tools that allow for fast deep learning project creation.
- We are hoping to build a model that has a high accuracy predicting the emotion depicted in an image of a human subject.

References

- http://www.consortium.ri.cmu.edu/data/ck/CK+/