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Project Proposal

Project:

- Gender prediction based on handwriting
    - Dataset : Set of images having handwritten texts and a csv file that has writer id and gender(labels) which need to be predicted. (https://www.kaggle.com/c/icdar2013-gender-prediction-from-handwriting/data)
- Emotion detection: We try to predict the emotion expressed by a person in the given image.
    - Dataset: csv files containing emotions column along with pixel values of facial images (labels) . (https://inclass.kaggle.com/c/facial-keypoints-detector/data)

Techniques we will explore:

- For the baseline, we have decided to use KNN for the classification task (but not just limiting us to this. We will also try other algorithms like SVM with a linear kernel (LinearSVC)). We'll further explore techniques for image feature extraction like edge detection, FFT (for feature extraction). Some of the possible ideas for expanding the size of the dataset is:
    1. Rotate the image by 5/10 degrees and append to the training data
    2. Finetune edge detection techniques and feed it in for the classifier.

  If possible, we'll try to explore Convolutional Neural Networks with a Softmax classifier at the end. RBM (Restricted Boltzman Machines) introduced by Hinton et. al. have turned out to be good in MNIST dataset, we think it may be useful here as well since this is a binary classification task.
- For emotion detection, we can apply KNN for a baseline, and then use OpenCV to engineer the features like: angle of smile, extent to which the lips are extended, etc.

Timeline:

- Tasks mentioned above for the baseline : By April 14th
- Choose a baseline score by using KNN or SVM - April 20th
- Introduce feature engineering aspects and further improve the accuracy April 30th
- Try to use Neural Networks to automatically extract/engineer the features