**Group Project Proposal**

**Group 13**

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**Motivation**

For this project, we will be annotating static image data to detect different forms of anger ranging from obvious rage to passive-aggressive anger and using the annotation to build a model for detecting the different levels of anger. The challenging aspect of this project is to be able to use machine learning algorithms to create a model that accurately differentiates the intensity of the anger emotion being shown in the image. The impact that our project would have is that we would have created a model that is able to accurately differentiate differing levels of anger which could contribute to the effort in anger recognition based on social signals.

**Approach**

The algorithms and machine learning model we plan to use are K-Means clustering, GMM, and K-Nearest Neighbours. Using both K-Means and GMM clustering on our data will help us determine the number of classes or different types of anger. We will then run a silhouette score on each of the clustering methods to determine the optimal number of classes. Since our project is focused on supervised learning using labelled data, we figured that the Nearest Neighbour algorithm fits our task of predicting the correct form of anger. The aspects that we will be focusing on are achieving a robust and accurate perception and low false positives in our predictions.

**Data**

The dataset that we are planning to create is a labeled set of 200 images featuring differing levels of anger which we have annotated. We plan to collect the data through taking screenshots from Youtube videos, Twitch clips and movies. In terms of similar datasets, we plan to extract the “anger” labeled images from Emonet and classify the different levels of anger for our project. The dataset that we will be creating will feature a mixture of naturalistic and acted expressions to reduce any bias that may arise if we had chosen to strictly focus on either naturalistic or acted expressions.

In terms of annotation of the dataset, we plan to annotate the data in two ways, one of the methods being subjective and the other being objective. For the subjective annotation measure, we will be annotating the data using free annotation which would include measures such as anger intensity and social signals. The objective method of annotation that we will be doing is FACS annotation using action units where we annotate the data and describe the action units being activated that we see in the image.

**Evaluation**

To evaluate the accuracy of our model, we plan on doing a confusion matrix to come up with an F1 score. The expected contribution of our project is to achieve an F1 score of at least 80%.

**Team**

We will be dividing up the task of creating the dataset where every member has to annotate 1/3 of the dataset. We will also be dividing up the work in coding of the algorithm where each member takes a part of the algorithm and completes it. We will be evaluating the model together as a team.