Design Document

### **Goals:**

**Long Term Overall-** To successfully construct a model to accurately create a facial emotion recognizer.

**Intermediate Goals:**

* To create a model that produces an accuracy score of above 85%.
* To minimize and avoid possible group attribution bias.
* To complete the project by Jul 25, 2021

### **Data Acquisition and Preparation**

#### **Part 1**

1. Download data set from Kaggle
2. Import necessary libraries
3. Turn dataset into data frames.
4. Exploratory data analysis (displaying each emotion, length of models, min and max , etc.)
5. Define Train and Validation (which is used to test the data)
6. Create a Convolutional. Neutral Network
7. Create the model, and tune parameters.
8. Fit model to training data.
9. Get predictions for train data.
10. Plot the accuracy and lost graphs
11. Make predictions, compute the f1 score
12. Print random pictures of emotions to prove the model works.

#### **Part 2**

1. Start with state of data frame after part 1 step 3.
2. Repeat steps (part 1) 6 through 11.

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### **Project Roles**

Alliayah Ottley : Program Leader

Schedule to start: Throughout the CapStone

Femi: Lead Code Designer

Schedule to start: Throughout Code Development Process

Thomas : Note Taker/Auditor

Schedule to start: Throughout the CapStone/Once code is complete

Brehanna Fox : Presentation Designer

Schedule to start: Once we have all our findings from implementation of the model/code

### **Problem Space**

We want to create a model that will accurately categorize each emotion into seven categories. This will be ultimately be determined by creating a Convolutional Neutral Network, tuning the parameters to fit the model. The challenge we need to face is finding what hyperparameters gives the highest testing and training accuracy. Not only do we want to find multiple models to determine the categories but the main goal is to find the most efficient model that’s just as accurate, if not more than previous models.

**Motivated Questions**

* What differentiates each face?
* What other existential factors will produce bias and how can we mitigate them?
* What model best suits the data provided?
* How can our findings improve future research?
* What to do if faces resemble different emotions?
* How can we use this model with other instances in a work environment?
* What is the best model to accurately depict each emotion?