

# Emotion analysis in video

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# Motivation

[IBM Watson creates an algorithmically perfect movie trailer for Morgan\(2016\)](#)

[Here is the Link to the trailer](#)



That's COOL!!

Method:

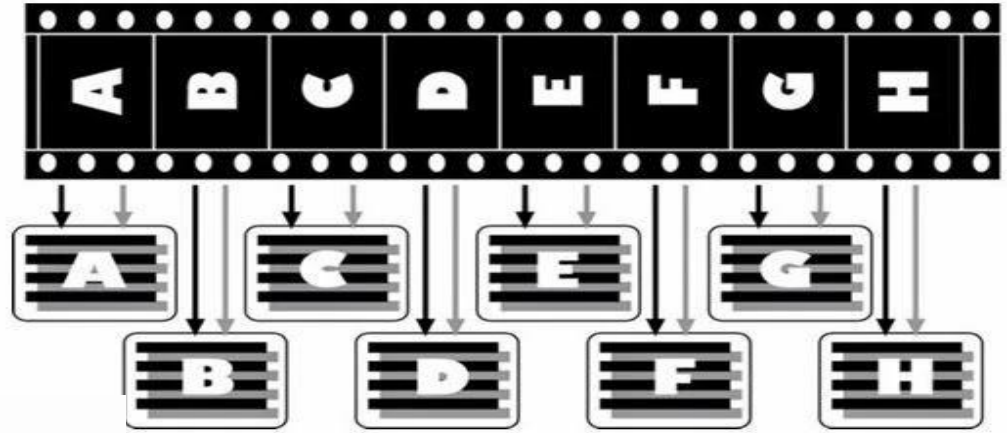
Step1: Divide the Video into Frames

Step 2: Detect the Frames containing faces

Step 3: Extract Faces

Step 4: Train Machine Learning Algorithms and Make Prediction.

# 1. Dividing Video



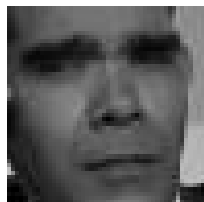
## 2. Detection of Frames containing Faces

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- We used python's dlib library for this task
- Python dlib is HOG(Histogram of Oriented Gradient) based detector combined with linear classifier.
- Drawback :- Looses efficiency with non-frontal human faces.

### 3. Extracting Faces

- Crop detected Faces
- Resize the faces.
- The size we chose is 48\*48 pixels
- Create a raw data from these faces



## 4. Testing

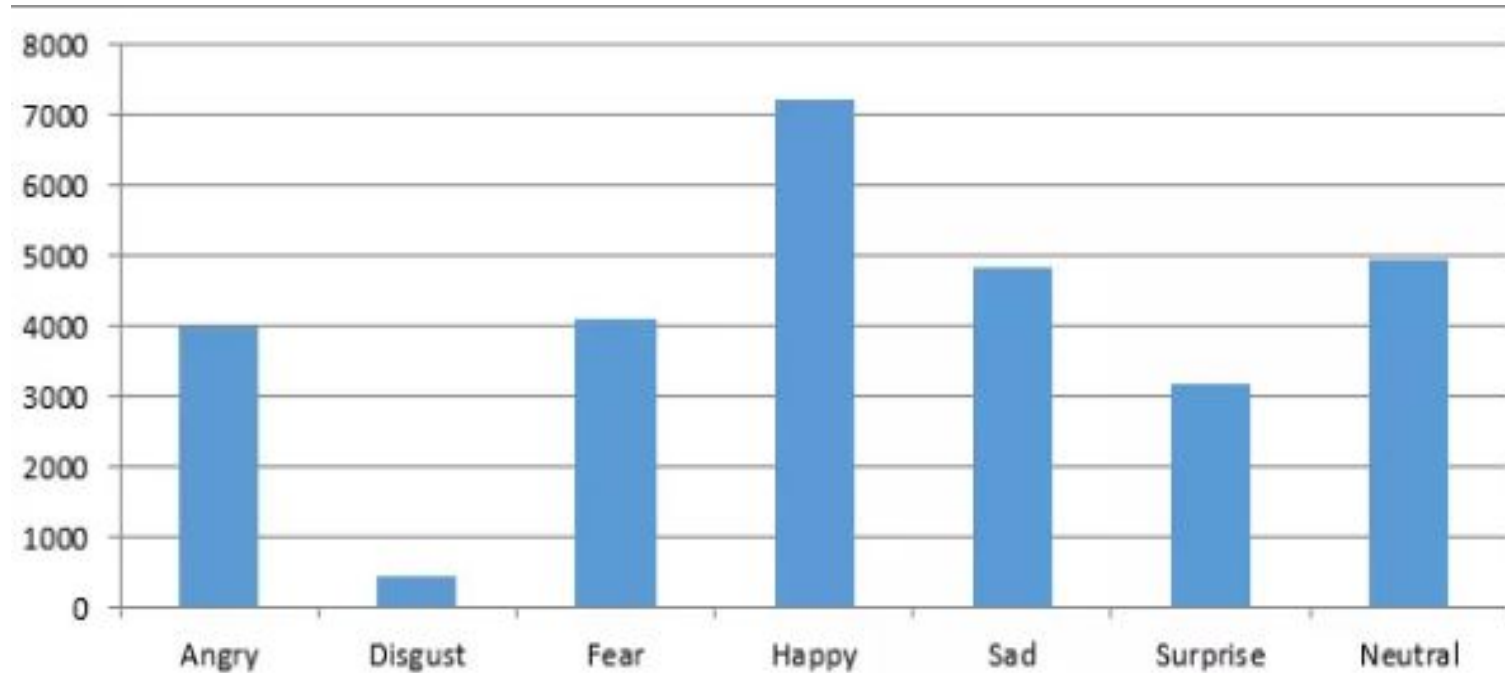
- Standard machine learning processes.
- Classifying image based on the emotion
- Prediction of labels using:
  1. SVM
  2. CNN model

# Training the CNN

- Number of Input parameters = 2304
- Number of Output parameters = 7
- Output - [0,1,2,3,4,5,6] = [angry, disgust, fear, happy, sad ,surprise, neutral]
- Number of Hidden-Layers = 2
- We used standard “fer2013” dataset for training the CNN



- The dataset contains 35887 images of faces with their emotion labels



# Results

- We calculated accuracy of our model using the fer2013 data.

Accuracy:

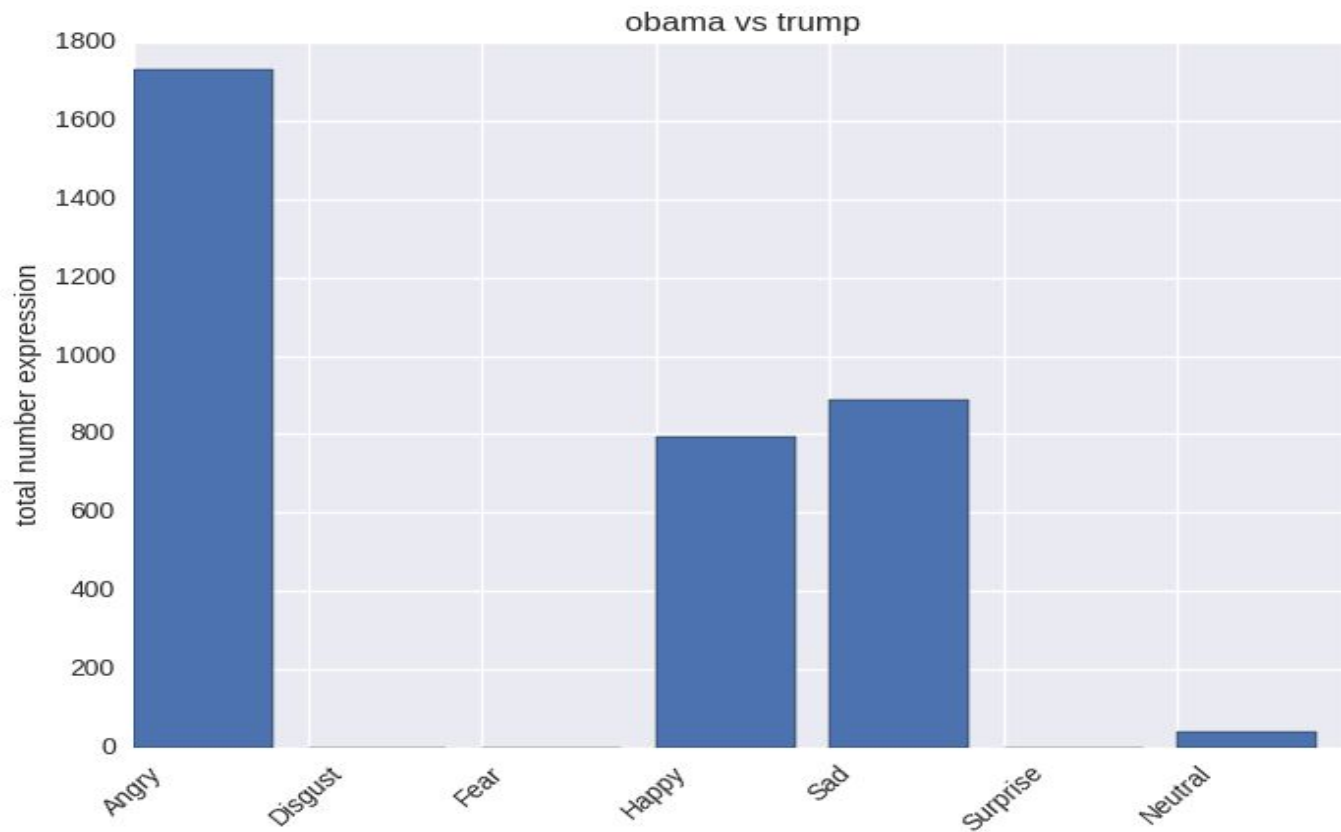
SVM : 47.05%

CNN : 62.63%

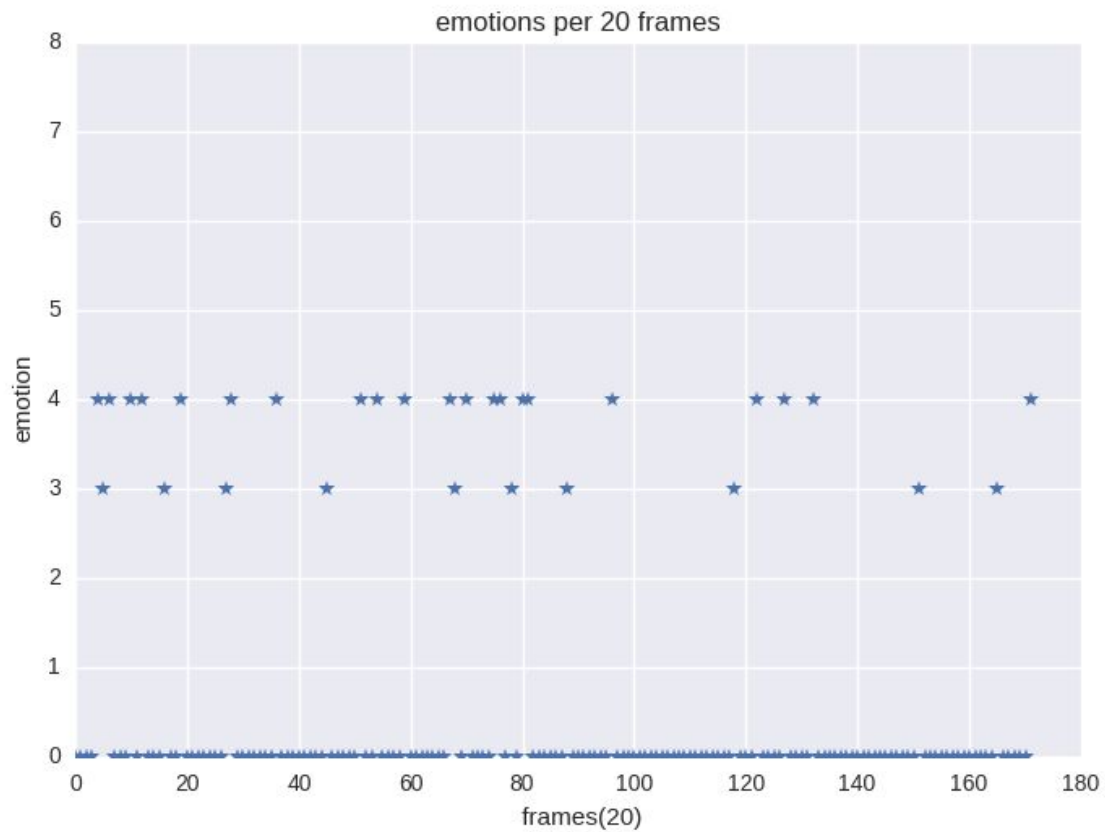
- The maximum accuracy we got is 62.63% (We know! Not very good but we are working on it).

# Testing on videos

- To test our model against real life videos we took some videos from YouTube as an example.
- Following are the results we got from them.



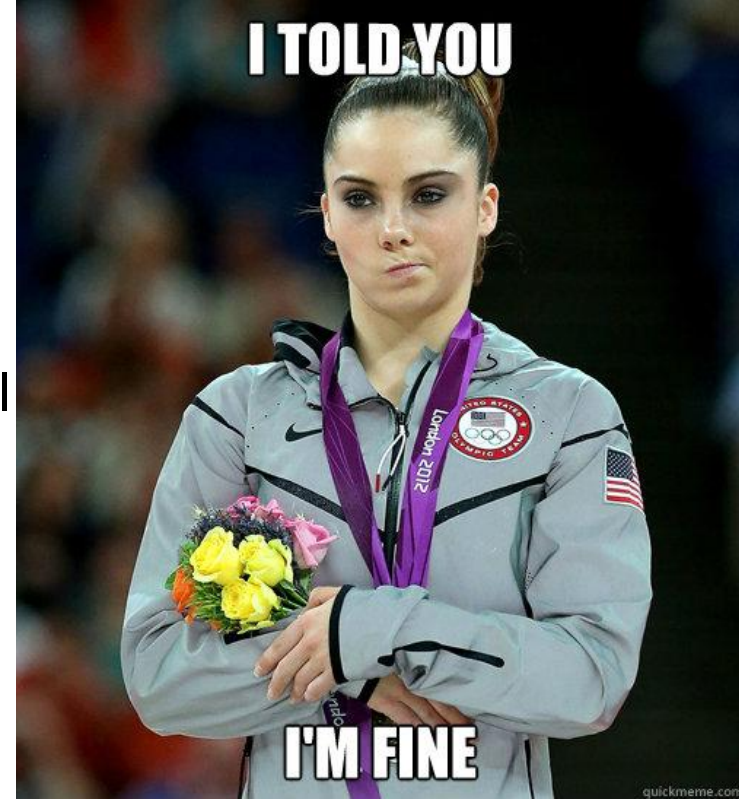
Total counts of emotions detected in the the video.



Emotions distribution throughout the video

# Applications

- Human behaviour studies
- Can be useful for Psychiatrists and Counselors.
- Recognize your partner's true emotional state
- Attention engagement for ads





Car driver →  
detect state and  
**alert** other **cars**

- analyzing the stress levels of drivers and recommending them whether to drive or not.