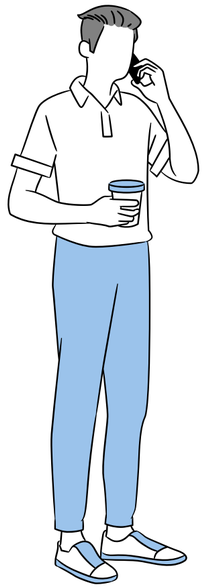
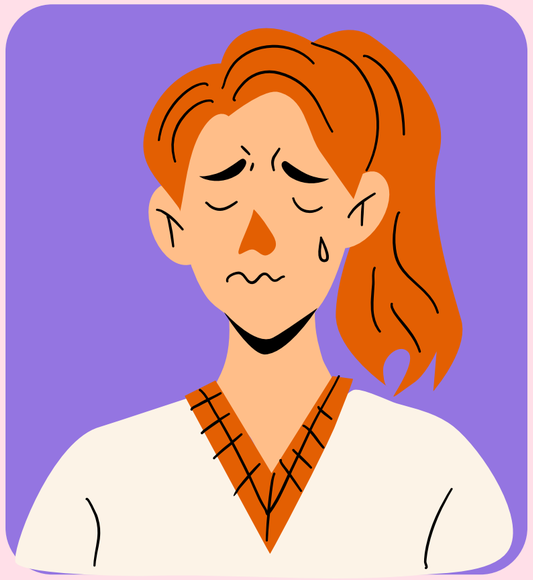
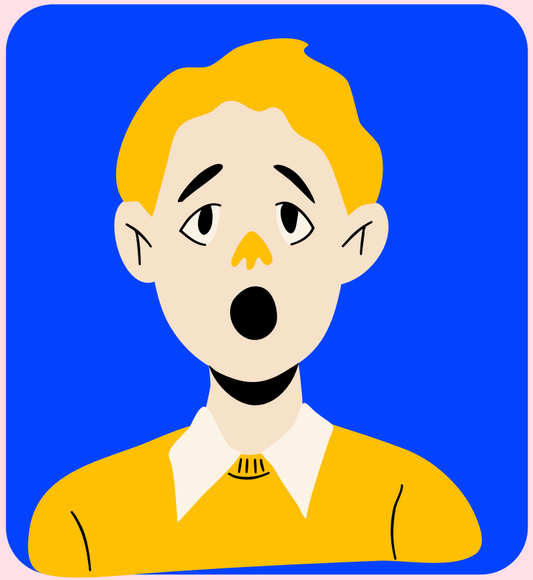


# Emotion Recognition





## Team Members

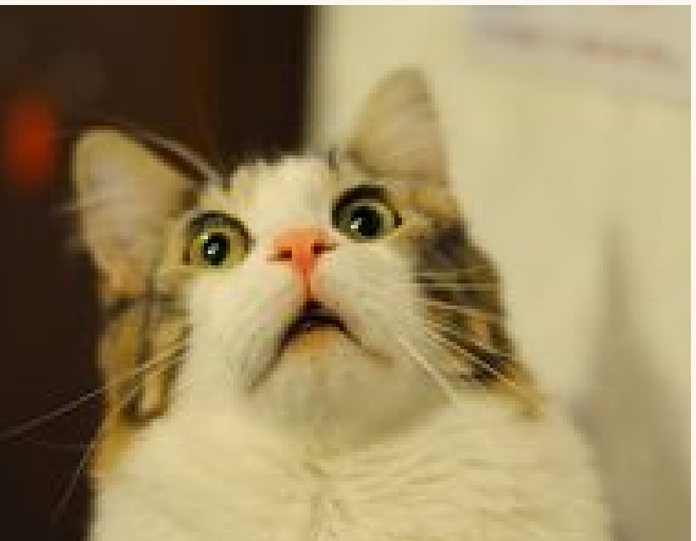

ManiChandana Thumati (AM.EN.U4CSE19169)
Balusu Sree Bhargav (AM.EN.U4CSE19112)
Grandhe Srinivasa Manikanta (AM.EN.U4CSE19122)

# Why emotion detection?

- The motivation behind choosing this topic specifically lies in the huge investments large corporations do in feedback and surveys but fail to get equitable response on their investments.

- Emotion Detection through facial gestures is a technology that aims to improve product and services performance by monitoring customer behavior to certain products or service staff by their evaluation

# Some Companies that make us of emotion detection...



- While Disney uses emotion-detection tech to find out opinion on a completed project, other brands have used it to directly inform advertising and digital marketing.
- Kellogg's is just one high-profile example, having used Affectiva's software to test audience reaction to ads for its cereal.
- Unilever does this, using HireVue's AI-powered technology to screen prospective candidates based on factors like body language and mood. In doing so, the company is able to find the person whose personality and characteristics are best suited to the job.

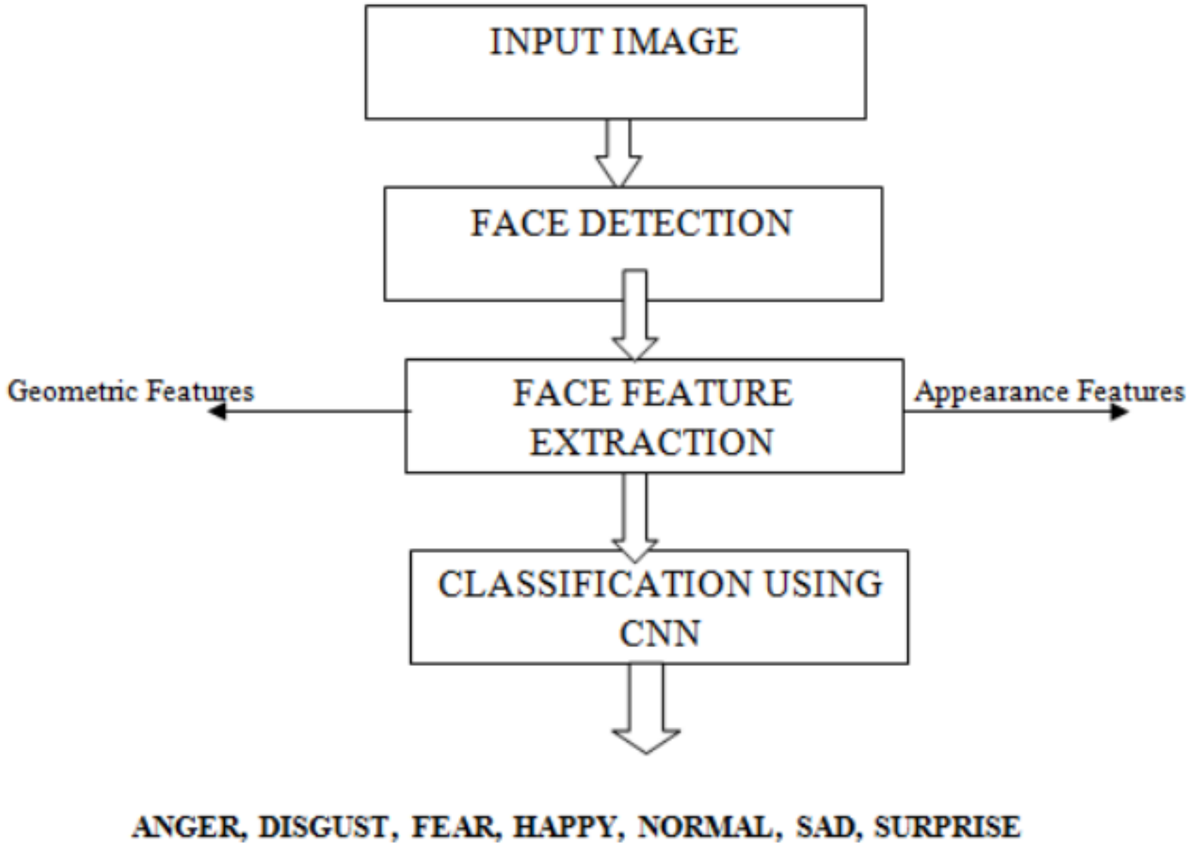
# Dataset Description

The data consists of 48x48 pixel grayscale images of faces. The faces have been categorized into facial expression in to one of seven categories (0=Angry, 1-Disgust, 2=Fear, 3=Happy, 4-Sad, 5=Surprise, 6-Neutral).

The training set consists of 28.709 examples. The public test set used for the leaderboard consists of 3,589 examples. The final test set, which was used to determine the winner of the competition, consists of another 3.589 examples. This dataset was prepared by Pierre-Luc Carrier and Aaron Courville, as part of an ongoing research project.

# Facial Emotion Recognition by CNN

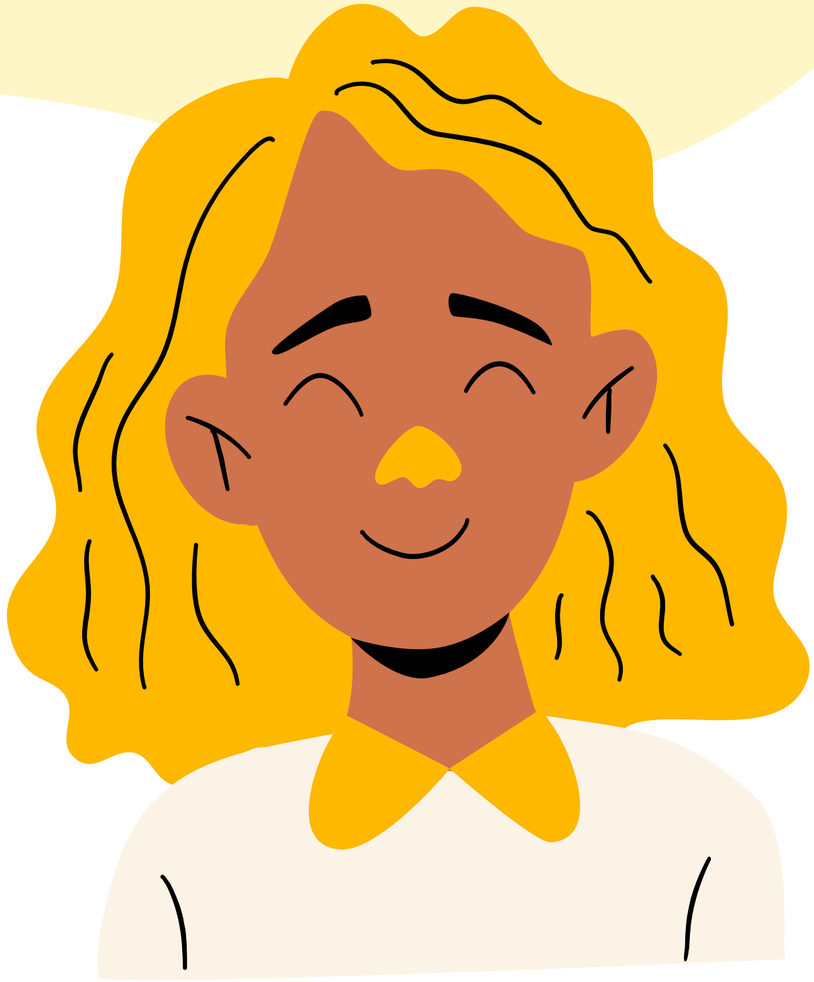
1. Data pre-processing
2. Image Augmentation
3. Feature Extraction
4. Training
5. Validation



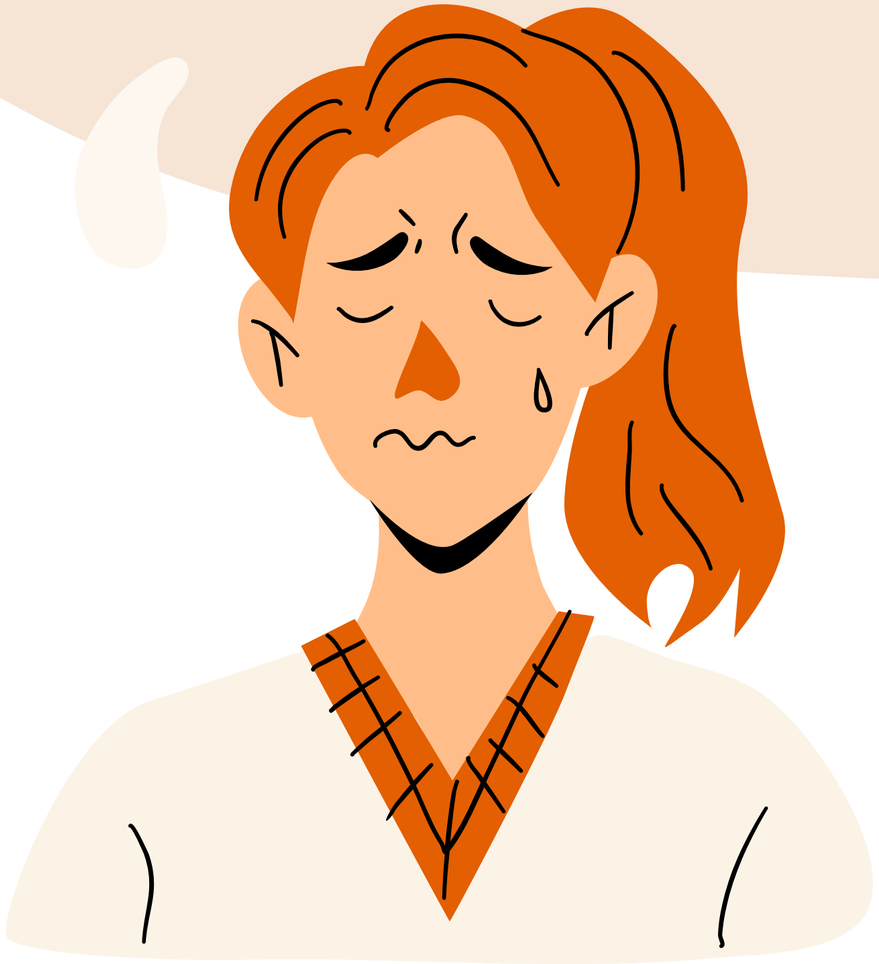
What am I feeling?

# Happiness

Happiness is a feeling of pleasure and positivity. When someone feels good, proud, excited, relieved or satisfied about something, that person is said to be "happy".



# Emotional expressions



What am I feeling?

## Sadness

It is emotional pain associated with, or characterized by, feelings of disadvantage, loss, despair, grief, helplessness, disappointment and sorrow.

What am I feeling?

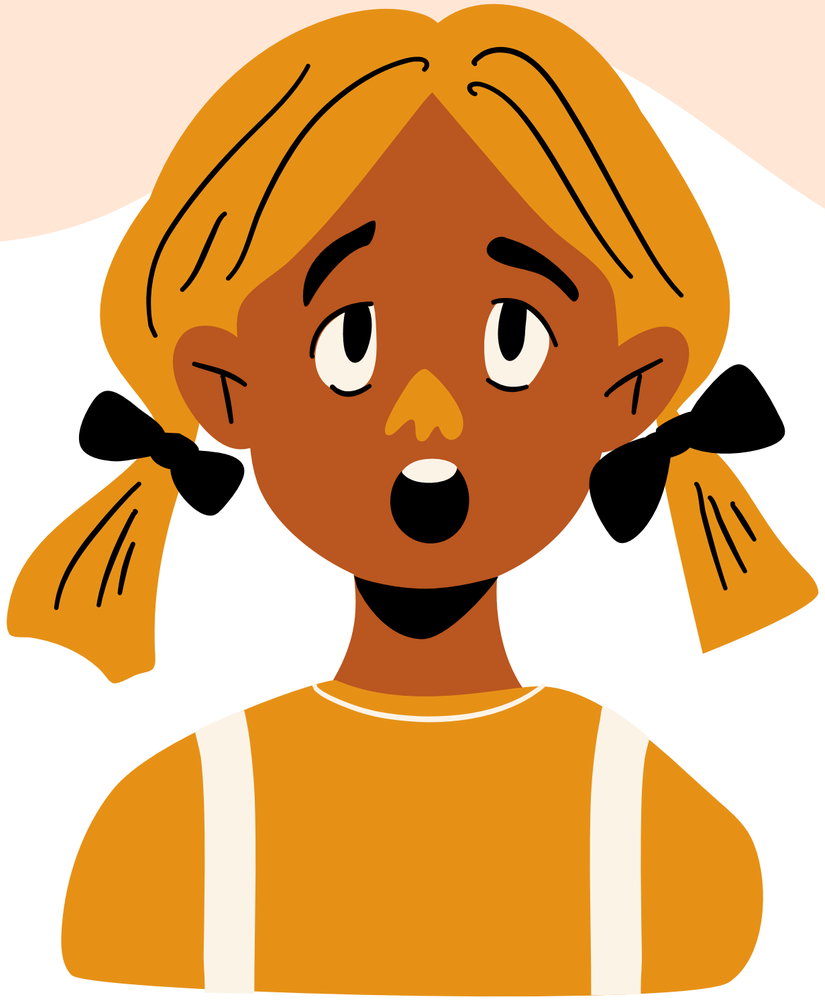
# Anger

a strong feeling of displeasure or annoyance and often of active opposition to an insult, injury, or injustice.

What am I feeling?

# Disgust

It is a feeling of aversion towards something. We can feel disgusted by something we perceive with our physical senses, by the actions or appearances of people, and even by ideas.



What am I feeling?

# Surprise

An example of surprise is hiding behind a corner and jumping out just as someone walks past.

What am I feeling?

# Fear

Fear alerts us to the presence of danger or the threat of harm, whether that danger is physical or psychological.

# Validation

- In the validation phase, various OpenCV functions and Keras functions have been used.
- The image frame is converted into grayscale and resized and reshaped with the help of numpy.
- This resized image is fed to the predictor which is loaded by keras.models.load_model() function.
- The max argument is output.

```
Epoch 1/10
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:7: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Mo
  import sys
20/20 [==============================] - 22s 1s/step - loss: 0.1052 - accuracy: 0.9669 - val_loss: 0.2001 - val_accuracy: 0.9596
Epoch 2/10
20/20 [==============================] - 21s 1s/step - loss: 0.1060 - accuracy: 0.9693 - val_loss: 0.1689 - val_accuracy: 0.9688
Epoch 3/10
20/20 [==============================] - 21s 1s/step - loss: 0.0841 - accuracy: 0.9811 - val_loss: 0.1973 - val_accuracy: 0.9635
Epoch 4/10
20/20 [==============================] - 23s 1s/step - loss: 0.1018 - accuracy: 0.9661 - val_loss: 0.2042 - val_accuracy: 0.9583
Epoch 5/10
20/20 [==============================] - 21s 1s/step - loss: 0.0854 - accuracy: 0.9724 - val_loss: 0.1916 - val_accuracy: 0.9609
Epoch 6/10
20/20 [==============================] - 21s 1s/step - loss: 0.0816 - accuracy: 0.9732 - val_loss: 0.2024 - val_accuracy: 0.9609
Epoch 7/10
20/20 [==============================] - 21s 1s/step - loss: 0.0900 - accuracy: 0.9732 - val_loss: 0.1796 - val_accuracy: 0.9648
Epoch 8/10
20/20 [==============================] - 21s 1s/step - loss: 0.0775 - accuracy: 0.9787 - val_loss: 0.1752 - val_accuracy: 0.9622
Epoch 9/10
20/20 [==============================] - 23s 1s/step - loss: 0.0821 - accuracy: 0.9724 - val_loss: 0.2050 - val_accuracy: 0.9583
Epoch 10/10
20/20 [==============================] - 21s 1s/step - loss: 0.0894 - accuracy: 0.9724 - val_loss: 0.2061 - val_accuracy: 0.9583
```

# Testing

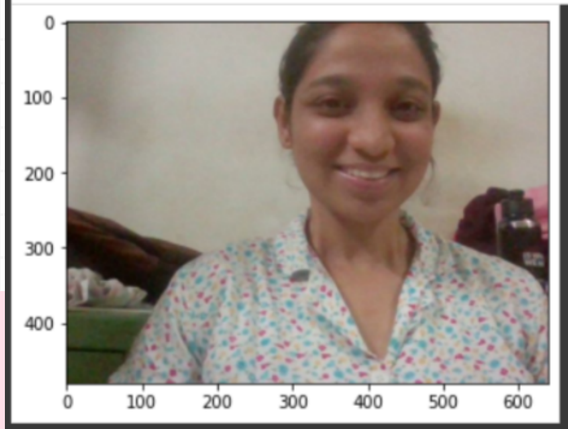
- In this model, epochs are assumed to be 10. If we continue to train our model after it has over the threshold, it will start to provide surprising outcomes and lose accuracy.
- The accuracy we attained for this model on the validation set is 95%.
- In testing phase we used real time image captured by webcam by using this link.

```
[ ]  take_photo()
```

```
'photo.jpg'
```

# Output And Statistics

```
OpenCV(4.6.0) /io/opencv/modules/objdetect/src/cascadedetect.cpp:1689: error: (-215:Assertion failed) !empty() in function 'detectMultiScale'
```

# Output And Statistics

```
OpenCV(4.6.0) /io/opencv/modules/objdetect/src/cascadedetect.cpp:1689: error: (-215:Assertion failed) !empty() in function 'detectMultiScale'
```