**Step1: Preparing the dataset**

Preparing the dataset of facial emotion images from a CSV file, converts each image from pixel values to an image format, and saves the images into categorized train and test folders based on their emotion labels

**Dataset: FER-2013 Dataset :** [**https://www.kaggle.com/datasets/deadskull7/fer2013**](https://www.kaggle.com/datasets/deadskull7/fer2013)

**Emotion Labels**

0: Angry 1: Disgusted 2: Fearful 3: Happy 4: Sad 5: Surprised 6: Neutral

**Technologies:**

Python, Numpy, Pandas, PIL(Python Imaging Library), tqdm, OS Module

**Step2: Data Preprocessing and Augmentation**

* Preprocessing steps: Shuffling the data, One Hot Encoding, Standardization, Reshaping, Train test validation split
* Data augmentation using ImageDataGenerator

**Technologies:** TensorFlow, Keras, scikit-learn, Plotly, Matplotlib

**Step3:** **Build, Train, and Evaluate the Convolutional Neural Network(CNN)**

**Step4: Saving this model to detect and display emotions in real-time from video and storing in CSV File**

Loads pretrained model,

either Start Video Capture or take existing Video

* Preprocessing Each Frame
* Face Detection (Using Haar cascade)
* Face Cropping and Preprocessing
* Emotion Prediction
* Display Prediction

Yet to improve the model, by taking CNN+LSTM and some etc..

Yet to increase the video quality

Yet to do some research work like paper reading by knowing the latest techniques and implemenations etc…­