TASK-3 : CV: Facial Recognition and Emoji Generation

1. What is image preprocessing ?

Image preprocessing are the steps taken to format images before they are used by model training and inference. This includes, but is not limited to, resizing, orienting, and color corrections.

2. Describe techniques you would use for classification.

I would first import libraries such as ‘numpy’ ,’cv2’,’tensorflow’ and ‘keras’.

Supervised Machine Learning:

Supervised learning, also known as supervised machine learning, is a subcategory of machine learning and artificial intelligence. It is defined by its use of labeled datasets to train algorithms that to classify data or predict outcomes accurately.

Unsupervised Machine learning:

Unsupervised learning, also known as unsupervised machine learning, uses machine learning algorithms to analyze and cluster unlabeled datasets. These algorithms discover hidden patterns or data groupings without the need for human intervention.

CNN( Convolutional Neural Network )

Is a supervised type of Deep learning, most preferable used in image recognition and computer vision. Image classification can be accomplished by any machine learning algorithms( logistic regression, random forest and SVM). But all the machine learning algorithms required proper features for doing the classification. If you feed the raw image into the classifier, it will fail to classify the images properly and the accuracy of the classifier would be less. CNN ( convolution neural network ) extract the features from the images and it handles the entire feature engineering part. In normal CNN architecture, beginning layers are extracting the low-level features and end level layers extract high-level features from the image. Before CNN, we need to spend time on selecting the proper features for classifying the image. There are so many handcrafted features available( local feature, global feature), but it will take so much time to select the proper features for a solution( image classification) and selecting the proper classification model. CNN handles all these problems and the accuracy of the CNN is higher compared with the normal classifier. In some scenarios still, handcrafted based classification gives promising results.

Object-Based Image Analysis (OBIA)

Supervised and unsupervised classification is pixel-based. In other words, it creates square pixels and each pixel has a class.

This as a supervised learning problem overall, where you have been given images of people showing various emotions.

Three popular ML algorithms, **SVM, RF, and kNN** were used for emotion intensity recognition. A comparative study and implementation of algorithms for measuring facial emotions and their intensities based on the different AUs (Action Units) are presented.