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**Section :** E

**Semester :** V

**Face Detection and Classification Using Machine Learning and Deep Learning**

**Focus :** Comparative Study between Machine Learning and Deep Learning Approach

**ABSTRACT:**

Face Detection is one of the key applications of Computer Vision and is often used in multiple softwares for verification. There are multiple ways to go about face detection and classification. This project will incorporate HaarCascade Classifier for Machine Learning Part of the Project and for Deep Learning Part, CNN(Convolutional Neural Network).

Object Detection using Haar feature-based cascade classifiers is an effective object detection method proposed by Paul Viola and Michael Jones in their paper, "Rapid Object Detection using a Boosted Cascade of Simple Features" in 2001. It is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It is then used to detect objects in other images.

A pre-trained frontal face and eye model will be used to detect face and consequently match with the database of image for recognition.

Computer Vision and pattern recognition is a major growing field in area of image processing. In that Convolutional Neural Network (CNNs) plays major role in computer vision. CNN is working on many applications in Image Classification and it is the core of most Computer Vision and pattern recognition systems today, from automatic tagging of photo in Face books to self-driving cars, recognizes digits, alpha-numerals, traffic signal boards, and the other object class. We used five layered Convolutional Neural Networks (CNN) model. On them one layers for convolutional, one layers for max pooling or sub sampling, one Flatten layer which converts 2D array into ID array and finally two fully connected layers for classification.

The UI will be a drag and drop interface that will allow user to drag and drop an image and the application will recognize the person in the image.

This will be a comparative study of Deep Learning Approach and Machine Learning approach for image classification and recognition which will be based on Algorithm Accuracy, Error, Algorithm Optimization etc.