**WE CLAIM**

1. A Standalone software for facial emotion and behavior detection, the system comprises of:

a face mask detection module in software for detecting the people who are wearing a face mask or not who pass through the camera fixed in a social complex;

a social distancing detection module in software for detecting the people who are maintaining social distance who pass through the wide-angled camera fixed in queue line or entrances;

an emotion detection module in software for detecting the people emotions who pass through the camera fixed in the market, shopping, malls, and parks;

an age & gender detection module in software for detecting the people’s age and gender through the camera fixed at most secure areas and private spaces; and

a drowsiness detection module in software for detecting the person who is driving the vehicle sleepy and camera is fixed behind the steering wheel.

1. The system as claimed in claim 1, wherein we wide-angle camera fixed in social areas to observe the emotions and behavior of people who pass through it.
2. The system as claimed in claim 1, wherein the camera captures the images and videos of people in and around the camera range and passed them to each module to predict various features.
3. The system as claimed in claim 1, wherein the captured images are pre-processed and extracted features from images using Region-based Convolutional Neural Networks (R-CNN) & YOLO image processing techniques.
4. The system as claimed in claim 1, wherein implementation of machine learning techniques of Linear discriminant Analysis (LDA), Independent Component Analysis (ICA), Principal Component Analysis (PCA), K-Nearest Neighbors (KNN), Logistic Regression, Decision Tree Approach, and Support Vector Machine (SVM).
5. The system as claimed in claim 1, wherein the processed are passed to the CNN model where it uses the ReLu function, sigmoid function, and max pooling.
6. The system as claimed in claim 1, wherein we use trained datasets and datasets from opensource (Haarcascade and fer2013).
7. The system as claimed in claim 1, wherein the complete software is implemented using python and its modules (OpenCV, Matplotlib, NumPy, SciPy, TensorFlow, Keras & Tkinter).
8. Face Mask Detection is done by using Region-based Convolutional Neural Networks (R-CNN) image processing algorithm and SVM & ICA machine learning algorithms;

Social Distance Detection, we implemented PCA and KNN machine learning techniques. In Gender Detection, as there are 2 genders to identify as they belong to the same class. Hence, we can use binary classification methods ICA, SVM, and Logistic Regression; and

For Age prediction, we use multi-label classification and multi-class classification techniques PCA, Random forests, and Naïve Bayes. For drowsiness detection, we consider eyes that are completely open by excluding all closed and partially closed eyes. Therefore, we found it deals with a single class (i.e., eyes opened completely) as we implement binary classification techniques likely LDA, SVM, and KNN;

We are confident that our model can provide information on Social Distancing, Emotion Recognition, Gender/Age Classification, Driver Drowsiness, and Illegal Behavior with a 96.3 percent accuracy. This model has the potential to inspire large-scale enterprises to incorporate and operate them in a way that maintains stability and robustness.

We would to like improve and sort our algorithms to make them more accurate in the upcoming days. We would like to add few addons that could deliberately improve our model on both sides, Trust & Security, improve hardware config’s: GPU Enhancement, Algorithm Tuning: Improving Stability and Feature Engineering: More Refined and Accurate.