**Project Status Report**

**B.Tech CSE and IT 7th Semester**

Note: Please Specify NA if not applicable and AS if already submitted.

1. GROUP NO (If ANY): **CS 4**

2. Department/Program: Computer Science and Engineering

3. Title of the Project : Face Mask Detector

4. Mentor Name: Dr. Ranvijay

5. Status of the Project: Ongoing

We started with reading Research Papers and understanding Deep Learning concepts. We identified the underlying challenges and prepared a suitable methodology to implement the project. We have scrapped images for the dataset. We have collected and processed the dataset. We have implemented the face extractor from photo/video frames. We have also loaded the MobileNet Model for training.

6. Origin of the Project

(Technicality and motivation behind this work should be elaborated)

In these tough COVID-19 times where social distancing and wearing a mask is prior to everything for safety.We came up with our project where we can alarm or detect the people without masks in image/video feeds.

We will train our deep learning model in such a way it itself will identify the person from a video or a photo whether he/she is wearing a mask or not.

7. Other Similar ideas available on internet (Please mention origin of sources like website addresses, ftp address etc):

Other similar ideas to this are: France is using AI to check whether people are wearing masks on public transport(<https://www.theverge.com/2020/5/7/21250357/france-masks-public-transport-mandatory-ai-surveillance-camera-software>).

8. Importance of the proposed project in the context of current status and its relevance to computer science and engineering (Highlight what is the new area or gap which will be solved in the project in relating to what is already known.)

` Our project can be used in numerous mobile applications and in numerous public places. Sporting a mask may be necessary in the near future, considering the COVID-19 crisis and this method to detect if the person wears a face mask may come in handy. This project can be deployed on low power mobile and embedded devices to alarm people not wearing masks thus increasing safety and help reduce spread of any disease in future.

9. Work Plan (Prepare a time chart to show Time Schedule of activities)

1. Methodology:

We are using Agile software development methodology.

Our project has two distinct phases. In the first phase we would train our DNN based face Mask detector Model using the obtained dataset. In the second phase we would extract the faces and bounding boxes from the images/frames and apply our trained model to determine if the face has a mask put on. The dataset we obtained consists of around 3800 images belonging to two classes with\_mask: 1900 images and Without\_mask: 1900 images. The images used were real images of faces wearing masks. The images were collected from the following sources: Bing Search APIs, RMFD dataset (Real-World Masked Face Dataset).

In our project we first extract the faces with their bounding boxes and apply our face detector model on the extracted faces. We use the DNN based face recognizer available in OpenCV. We chose this over other available options like Haar feature-based cascade classifiers for its superior latency on video feeds with greater accuracy.

For detecting if a face has a mask on we would use our dataset to tune the MobileNet model trained on ImageNet dataset. It is a streamlined architecture that uses depth-wise separable convolutions to build light weight deep neural networks. It is suitable for low power for Mobile Vision Applications with low computational power. It has a lower number of parameters with high accuracy making prediction to be low in latency thus making MobileNet useful for our project.

The tech stack that we are using is: tensorflow, keras, imutils, numpy, opencv-python, matplotlib, scikit-learn, Python 3.8

1. Time Schedule of activities

1. Studying about Deep learning (Aug-Sept)
2. Studying Relevant research papers (Aug-Sept)
3. Identifying challenges (Aug-Sept)
4. Identifying Methodology (Aug-Sept)
5. Finding dataset (Aug-Sept)
6. Code for using search Engine API to add diversity in dataset (Oct)
7. Code for extracting faces from images (Oct)
8. code for loading MobileNet for tuning (Oct)

TO DO:-

1. Modify the architecture to fit our use case and dataset
2. Train and tune the model
3. saving the model on disk
4. code for extracting faces from videos
5. code for applying the mask detector model on extracted faces
6. combined working code for face mask detector

1. Outcome expected from the project and its relevance to computer science and engineering.

Our trained model would be able to identify if a person has worn a mask or not in a computationally efficient manner.

1. Summary of roles/responsibilities of all students:

|  |  |  |
| --- | --- | --- |
| Name | Registration Number | Contribution |
| ABHIJEET BISWAS | 20174010 | Studying about deep learning and relevant research papers,Identifying challenges and devising methodology, Finding dataset, Code for using search Engine API to add diversity in dataset. |
| KISHLAY KUMAR | 20174132 | Studying about deep learning and relevant research papers,Identifying challenges and devising methodology, Finding dataset, Code for extracting faces from images. |
| AMAN KUMAR GAURAV | 20174151 | Studying about deep learning and relevant research papers,Identifying challenges and devising methodology, Finding dataset,code for loading MobileNet for tuning. |

Comments (if any):

Suggestions for improvement (if any): \_\_\_\_\_\_\_\_

Signature of Mentor

PANEL COMMENTS

Comments (if any):

Suggestions for improvement (if any): \_\_\_\_\_\_\_\_\_\_\_

Signature of Panel Representative