**Final Year Project Proposal**

**Design and Implementation of a Face Mask Detection System**

**BY**

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Introduction

By the end of 2019, infectious coronavirus disease (COVID-19) was reported for the first time in Wuhan, and it has become a public issue in China and even worldwide. This pandemic has devastating effects on societies and economies around the world causing a global health crisis. Therefore, to prevent rapid COVID-19 infection, many solutions, such as confinement and lockdowns, are suggested by the majority of the World’s governments.

However, the World Health Organization (WHO) advised that the wearing of face masks should be mandatory and Nations, Academic institution and Organization around the world followed the recommendation by making law to administer this mandate. This brought about problem with enforcement of these laws.

* 1. Statement of the Problem

Wearing of face masks are essential in the fight against COVID-19 and rules were made and enforced to a certain degree but due to Human error or public apathy, these rules were not well imposed.

With the Introduction of a face mask Detection system, this issue can be solved with more proficiency.

* 1. Literature Review

Deep learning technique has been useful for big data analysis and has its applications in computer vision, pattern and speech recognition, etc. Various works have been done and several studies carried out on face mask detection systems. However, a few research studies have been found on face mask detection based on the technology of Artificial Intelligence (AI) and Image Processing.

Parul Maurya’s COVID-19 Face Mask Detection of the 2nd International Conference on Advanced Research in Science, Engineering and Technology (March 2021) for one was focused more on Alerting the User to wear their mask thereby focusing less on the accuracy. While, Madhura Inamdar and Ninad Mehendale’s Real-time face mask identification adopted some advanced deep learning networking techniques to work with a very large dataset.

This project intends on building on previous works thereby creating a fastest and more accurate system

* 1. Aim and Objectives of the Project

The aim of this project was to develop a system to detect whether a person is wearing a face mask or not. The objectives of the project are to:

1. formulate a model for a face mask detection system;
2. design the model formulated above;
3. simulate/implement the model; and
   1. Methodology of the Project

This study involved reviewing relevant literatures in areas of a face mask detection system to formulate the model. It also involves train the model using Keras with network architecture. Training the model is the first part of this project and testing using webcam using OpenCV is the second part.

* 1. Scope of the Project/Study

This study involves developing the face mask detector model for detecting whether person is wearing a mask or not with Python.

* 1. Significance of the Project/Study

With everyday that goes by, the world become more and more technologically inclined. Because of this, people are taking advantage of this in problem solving and the issue of wearing of face mask needs to be solved in the same manner.

Therefore, creating a face mask detection system allows and aims for simplicity and efficiency.

* 1. Expected Result

The likely outcome of this project is to produce a real time face mask detection with a good degree of accuracy.

* 1. Expected Contribution to Knowledge

As the technology is booming with emerging trends therefore the face mask detection system which can possibly contribute to public healthcare. The model is trained on an authentic dataset. I used OpenCV, tensor flow and keras libraries found in Python to detect whether people were wearing face masks or not. The models were tested with images and real-time video. The accuracy of the model is achieved and, the optimization of the model is a continuous process and we are building an accurate solution by tuning the hyper parameters. This specific model could be used as a use case for edge analytics. By the developing this system, we can detect if the person is wearing a face mask and allow their entry would be of great help to the society.

* 1. Reference

1. World Health Organization et al. Coronavirus disease 2019 (covid-19): situation report, 96. 2020. - Google Search. (n.d.).
2. Inamdar M., Mehendale N. Real-Time Face Mask Identification Using Facemasknet Deep Learning Network. *SSRN Electron. J.*2020 doi: 10.2139/ssrn.3663305
3. M. Jiang, X. Fan, Retinamask: A face mask detector, arXiv preprint arXiv:2005.03950 (2020)