COVID-19 Face Mask Detector

Project Proposal

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Introduction

The goal of our project is to identify whether a person is **correctly** wearing a mask or not. A person correctly wears a mask when the mask completely covers his mouth and nose.

Problem Statement

COVID-19, as we know, is a pandemic that has claimed millions of lives in the year 2020. Wearing a face mask has been identified as a successful method of preventing the spread of COVID amongst people. It is strongly recommended to wear a mask in public places.

Most people follow the guidelines and wear masks. Some people do not wear it while others wear it incorrectly which doesn't cover their nose/mouth as it should. Our project aims to train a model on images of people wearing masks and develop an app/tool to identify faces of people wearing the mask correctly or wearing it incorrectly.

Dataset

We will be using images of people wearing a mask and those wearing it incorrectly to train the model for this project. The dataset can be found https://github.com/cabani/MaskedFace-Net.

The size of the dataset is 40GB with 20GB of images with mask worn correctly and 20GB of images with mask worn incorrectly.

Network and Framework

For the purposes of this project we are planning to use Convolutional Neural Networks, in their standard form. We will also explore pretrained models like ResNet, VGG and Xception. For implementing the network, we will be using Pytorch because of its robustness.

References & Metrics

The following references will be used to enrich our understanding of the topic and implementation of the model.

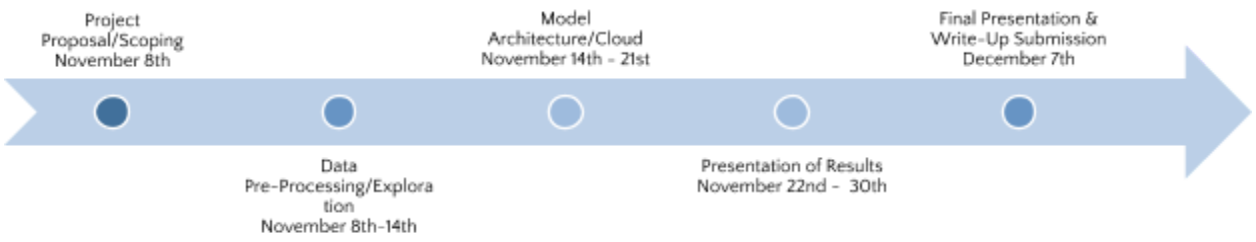
- Real-Time Facemask Recognition with Alarm System using Deep Learning: https://ieeexplore.ieee.org/abstract/document/9232610?casa_token=2_ejtG90C3gAAAAA:2cf7iwAxwNApjnWcwikVtBr-uLoR8c4U2i1myMUlj-w8H4brPsnYmzp0H_hvQZeJxAH3U17V2A

- A hybrid deep transfer learning model with machine learning methods for face mask detection in the era of the COVID-19 pandemic https://www.sciencedirect.com/science/article/pii/S0263224120308289

- COVID-19: Face Mask Detector with OpenCV, Keras/TensorFlow, and Deep Learning https://www.pyimagesearch.com/2020/05/04/covid-19-face-mask-detector-with-opencv-keras-tensorflow-and-deep-learning/

For assessing the performance of the network, we will be using the following metrics – Accuracy and F1 Score.

Project Timeline



Given above is a tentative timeline for our project. This is subject to changes based on our requirements.