Course Name: 19AI 621

Course Title: Computer Vision

Title: Face Mask Detection.

## **Team Members and Roles:**

|  |  |  |
| --- | --- | --- |
| Roll No | Name | Role |
| CB.EN.P2AID20013 | Arjun K | Spatial Domain |
| CB.EN.P2AID20015 | Athira Krishnan | Spatial Domain |
| CB.EN.P2AID20016 | Athul Mathew Konoor | Spatial Domain |

## **Dataset – Image dataset.**

|  |  |
| --- | --- |
| Type | Color Image |
| Size | Multiple sizes |
| Row \* Column | NA |
| Resolution | NA |
| Color Model | RGB |
| Format | PNG |
| Data Acquisition | Web, Camera |
| No of classes | 3 |
| No of Images | 853 |
| Annotation | PASCAL VOC format. |

## **1.3 Dataset Description:**

This dataset contains 853 images belonging to the 3 classes, as well as their bounding boxes in the PASCAL VOC format. The classes are:

* With mask.
* Without mask.
* Mask worn incorrectly.

The dataset contains images of different sizes.

## **2.1 Analysis:**

1. How many individuals are there in the scene?
2. How many masked individuals are there in the scene?
3. How many un-masked individuals are there in the scene?
4. How many individuals are wearing mask improperly?
5. How does factors such as various angles and lighting conditions affect classifications?
6. What is the accuracy of the model in these classifications?
7. Do people with spectacles tend not to wear mask properly?
8. Which age group usually wears masks correctly?
9. Is the current environment upholding covid regulations strictly (% of users wearing mask in a crowd)?

## **2.2. Analytics:**

1. Are there any social distancing violations in the scene?
2. Do people wear mask correctly all the time?
3. Is there any particular time in a day people usually tend to remove mask?
4. Do people use mask when they are on phone.
5. Can we identify users who are not or improperly wearing the masks?
6. Do people use multiple masks during a day?
7. Does weather have any impact on the behavior of wearing masks?
8. Who usually fails to wear masks (Men or Women)?
9. Do children wear masks correctly?
10. Do people wear mask correctly when they are engaged in a conversation?

## **3. Products similar in the market**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No. | Product (Company) | Features | Reference |
| 1 | Face Mask Detection Software- Aerialtronics. | 1. Receive real time notifications if people are not wearing a mask or wear it badly.  2. Can Be deployed across unlimited locations on any type of camera | <https://www.aerialtronics.com/en/products/face-mask-detection-software> |
| 2 | Face Mask Detection System using Artificial Intelligence - Leewayhertz. | 1. App users can also add faces and phone numbers to send them an alert in case they are not wearing a mask.  2. If the camera captures an unrecognized face, a notification can be sent out to the administrator. | <https://www.leewayhertz.com/face-mask-detection-system/> |
| 3 | Face Mask Detection - Xovis. | 1. Sensors count all people and recognize whether a person is wearing a face mask or not. | <https://www.xovis.com/en/products/detail/face-mask-detection/> |

## **4. Industry/Research Labs:**

|  |  |
| --- | --- |
| **Features** |  |
| Nose |  |
| Eye |  |
| Mouth |  |
| Mask. |  |

## **5. Problem statement:**

Given a dataset of individuals the aim of this case study is to determine a model that will perform the following:

1. Detect Faces.
2. Detect if the individual wears a mask or not. If yes, is it proper?

## **6. Reference**

1. Kaggle Dataset: <https://www.kaggle.com/andrewmvd/face-mask-detection>

2. Papers

a.) Face mask detection for covid\_19 pandemic using pytorch in deep learning:

Sneha Sen and Khushboo Sawant 2021 IOP Conf. Ser.: Mater. Sci. Eng.1070 012061

b.) RETINAFACEMASK: A FACEMASKDETECTOR:

[arXiv:2005.03950v2](https://arxiv.org/abs/2005.03950v2) [cs.CV]