

Deep Learning – Case Study

Face Mask Detection

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1. Introduction

This case study is designed to detect whether a person is wearing face mask or not . It uses the CNN and MOBILENET model.

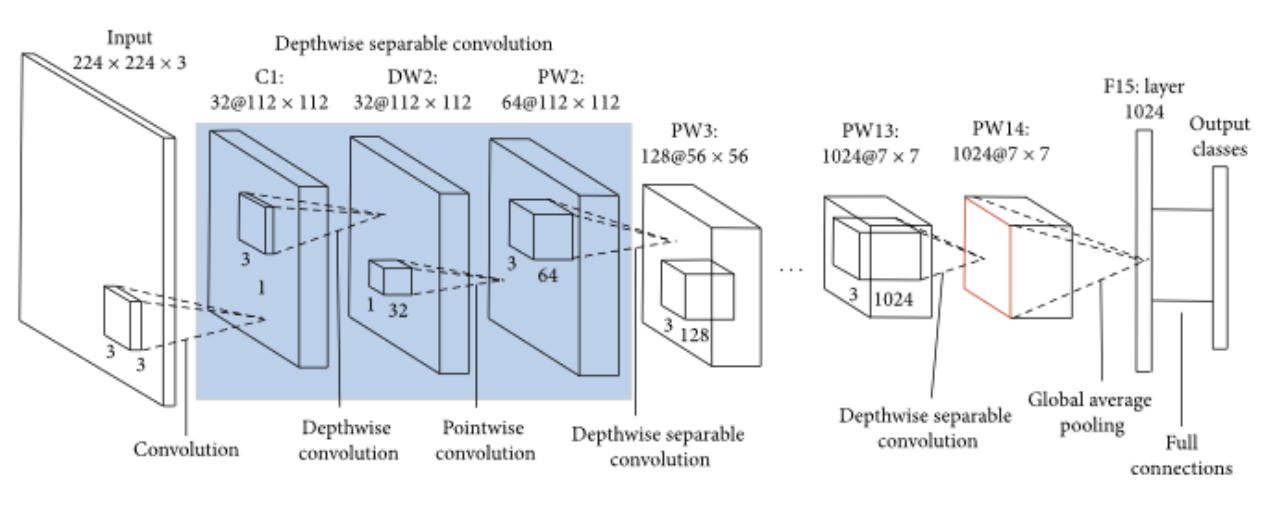
This case study can be used across various sectors where there is a need to detect whether a person is wearing mask or not.

2. Tools and Technologies

Tools and Libraries	Usage
Keras	This library is used for building the network architecture.
tensorflow	TensorFlow is mainly used for: Classification, Perception, Understanding, Discovering, Prediction and Creation
sklearn	It provides a selection of efficient tools for machine learning and statistical modeling including classification, regression, clustering and dimensionality reduction via a consistence interface in Python.
imutils	A series of convenience functions to make basic image processing functions such as translation, rotation, resizing, skeletonization, and displaying Matplotlib images easier with OpenCV
Spyder	Used as a platform to execute code.

3. Model Explanation and Architecture

The model architecture is a Mobilenet and As the name applied, the MobileNet model is designed to be used in mobile applications, and it is TensorFlow's first mobile computer vision model.



MobileNet uses depthwise separable convolutions. It significantly reduces the number of parameters when compared to the network with regular convolutions with the same depth in the nets. This results in lightweight deep neural networks.

A depthwise separable convolution is made from two operations.

1. Depthwise convolution.
2. Pointwise convolution.

MobileNet is a class of CNN that was open-sourced by Google, and therefore, this gives us an excellent starting point for training our classifiers that are insanely small and insanely fast.

4. Working

The images we use daily contains a large dataset of facemask half of the images are with mask and other are without mask , and also here we are defining that we are going to use 20 epochs, also when we load the image then the exected size of the image is mentioned there which is 224×224 and then we have to perform one hot encoder and then construct the training image generator for data augmentation the we have to load the MobileNetV2 network, ensuring the head FC layer sets are left off

then we have to train the model and use this model to predict the output. When we use it and make a frame to open a camera and detect the mask at the end.

5. Code

https://github.com/ishika1011/Face_Mask_Detection

** Code and Report is available in the GitHub repository.

6. Output

