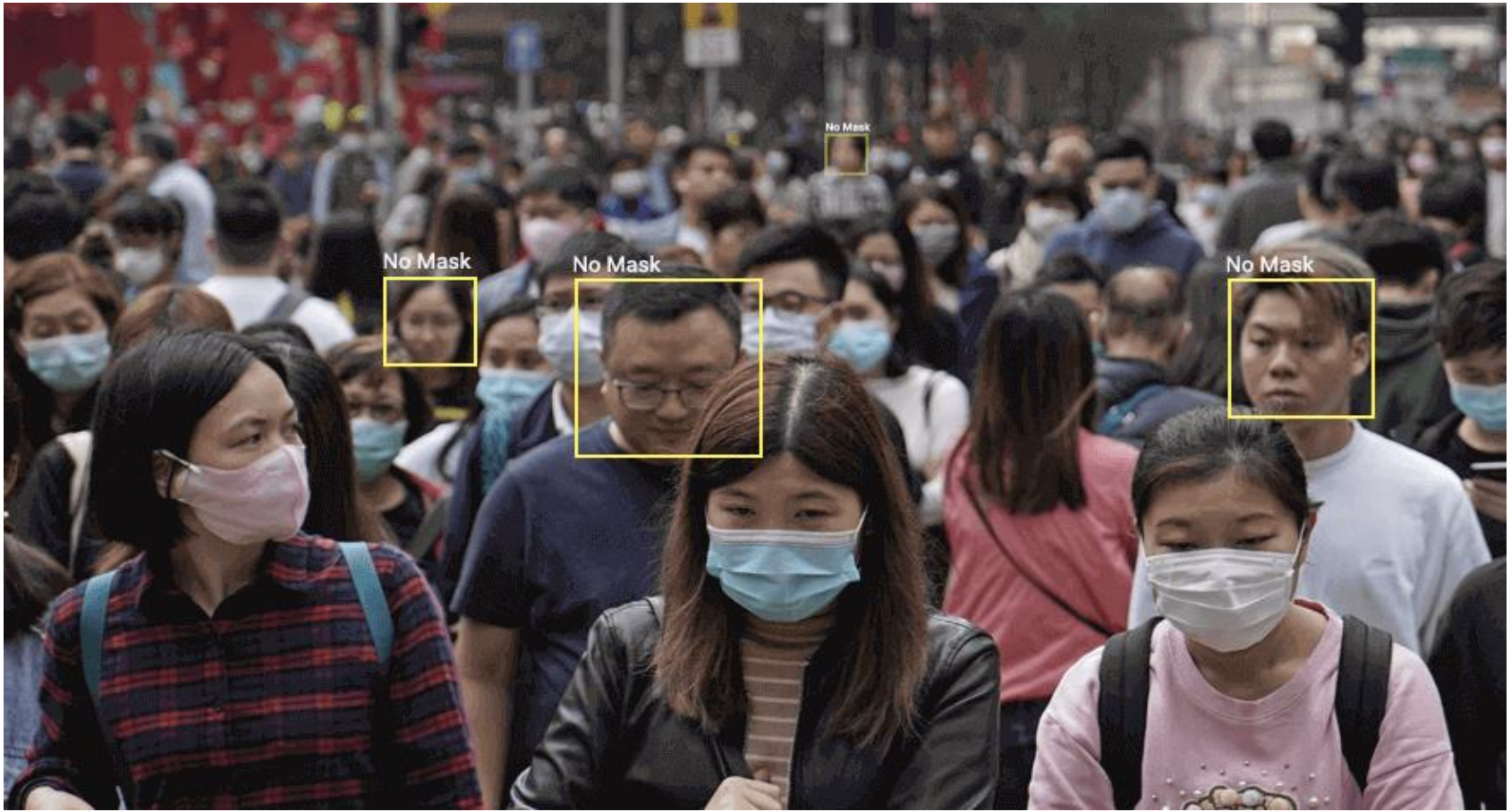
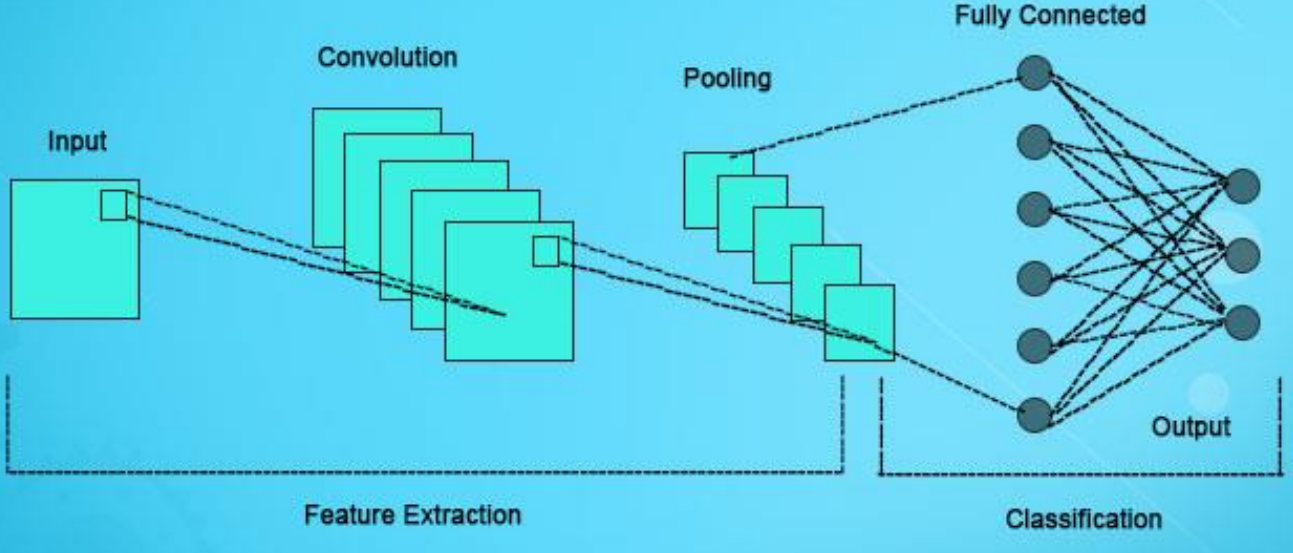
Problem



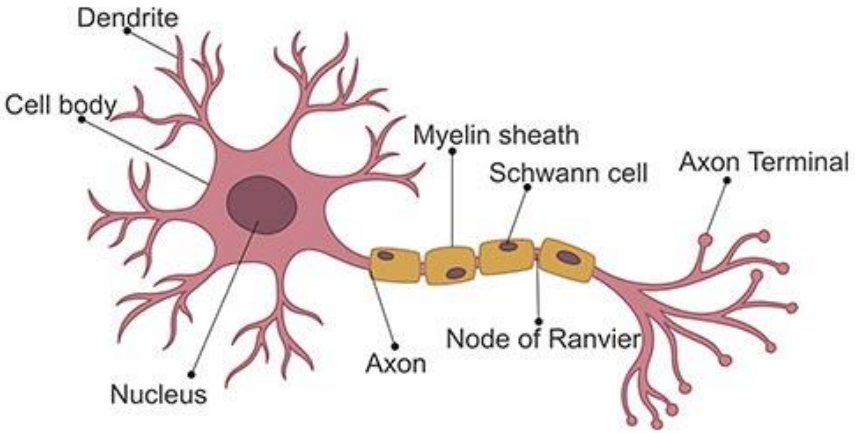
Solution

I decided to build a very simple and basic Convolutional Neural Network (CNN) model using ***TensorFlow*** with ***Keras*** api and ***OpenCV*** to detect if a person is wearing mask or not.

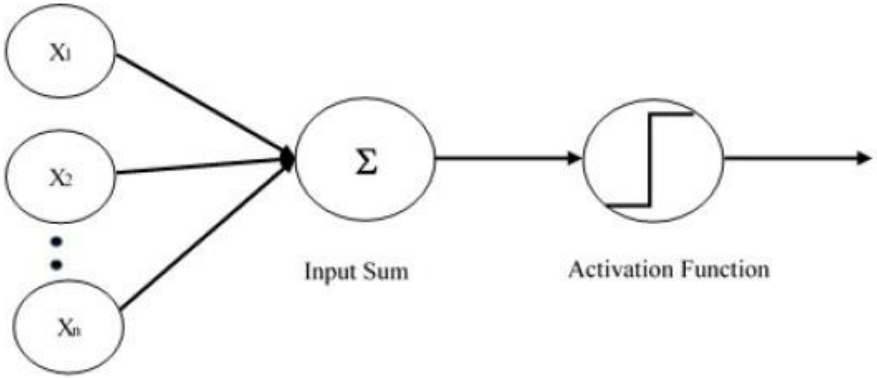
What is Convolutional Neural Network?



In deep learning, a **convolutional neural network** (**CNN**, or **ConvNet**) is a class of artificial neural network, most commonly applied to analyze visual imagery.



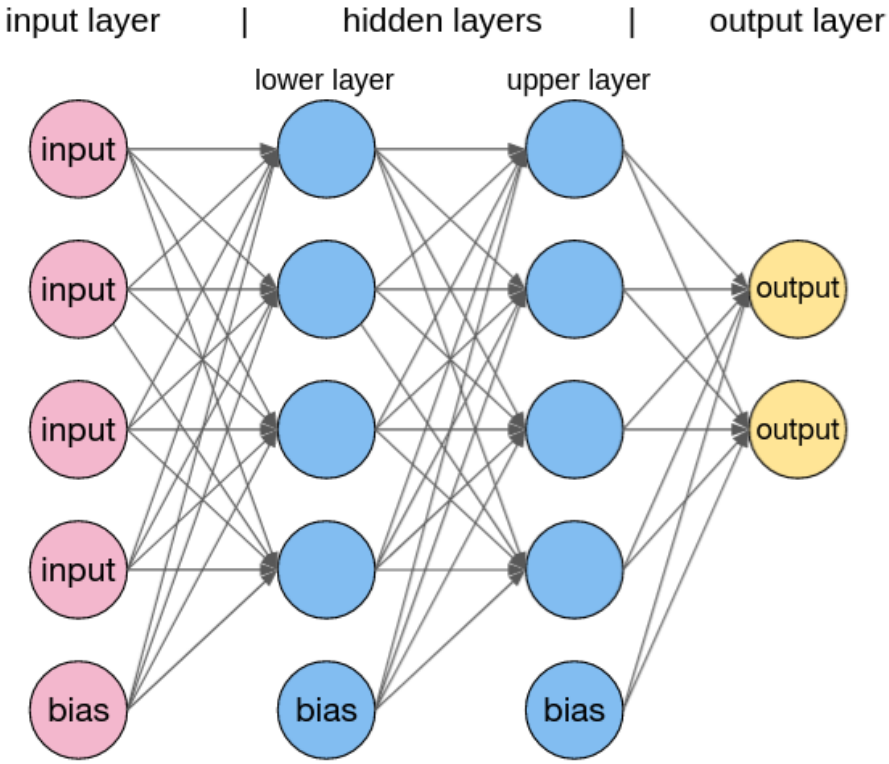
Neuron



Perseptron

Actual Human Brain with millions of neuron’s connected to each other.

What we are going to do.



This is called Multi Layered Perceptron or MLP.

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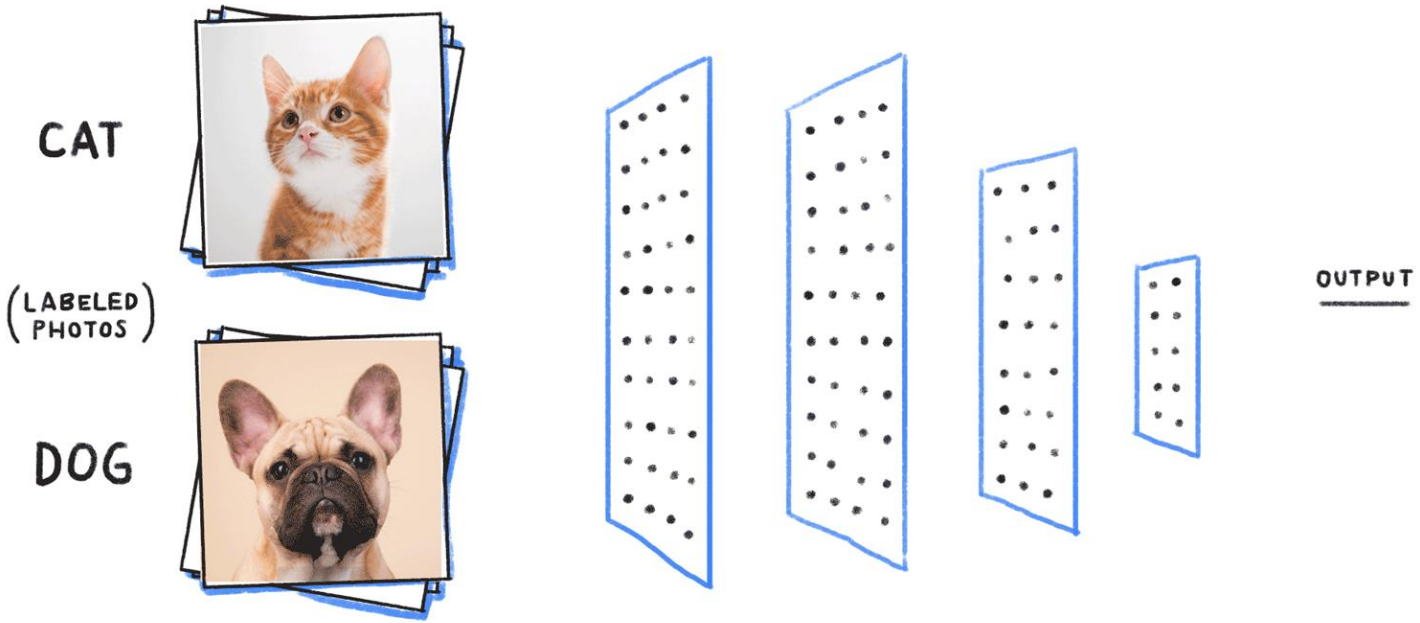
This can also be used to detect any object.



Project Walkthrough

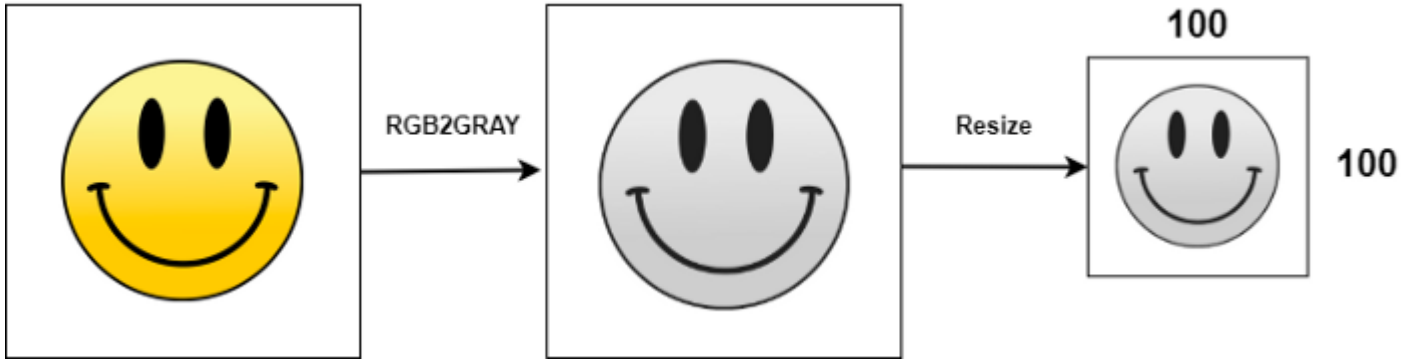
1. Collecting Dataset
2. Data Pre-processing
3. CNN architecture development, training, and testing
4. Model deployment for live webcam feeds

Collecting Dataset

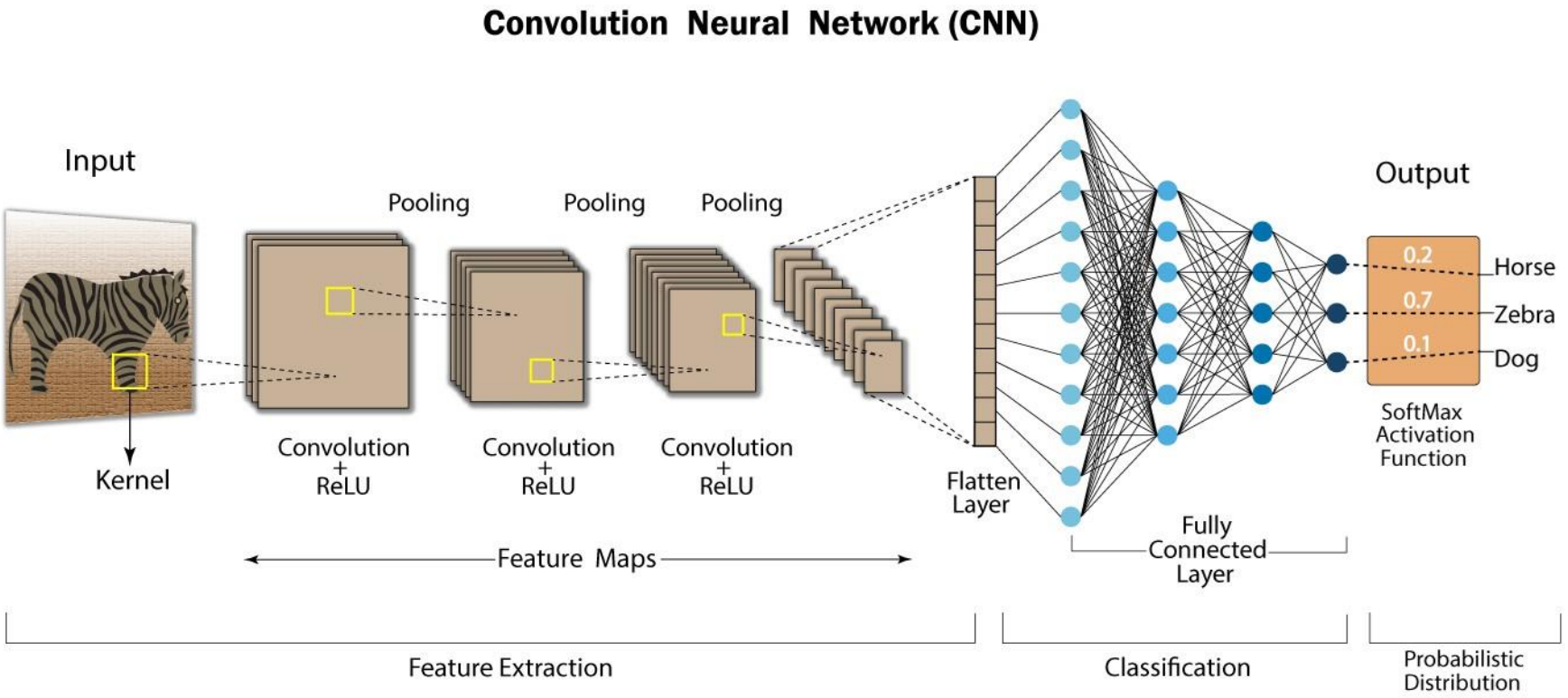
In our case we want images of people with and without mask. This data ca

Data Pre-processing

By Default Images has multiple channels which is not required and can take high computational power, so First, each image was converted from RGB (Red, Green, Blue) to a Grayscale image then rescaling it to 224x224.

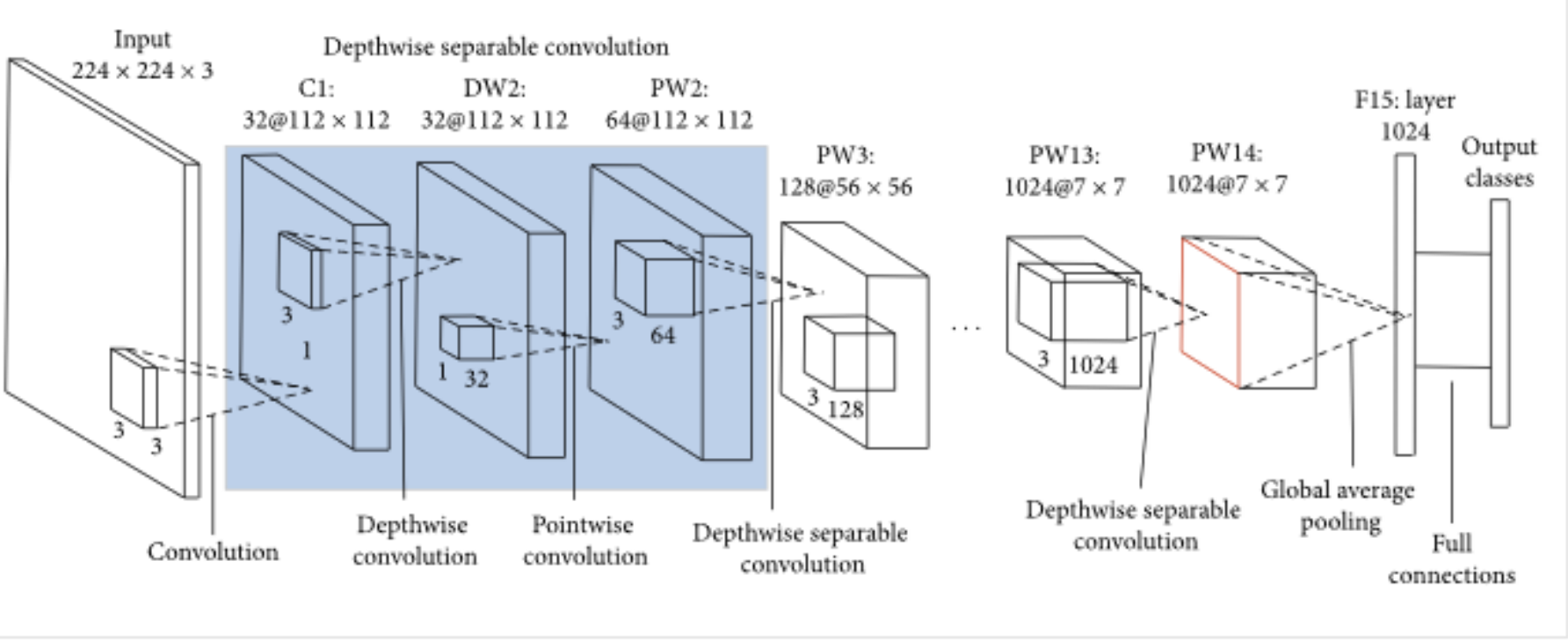


CNN architecture development, training, and testing



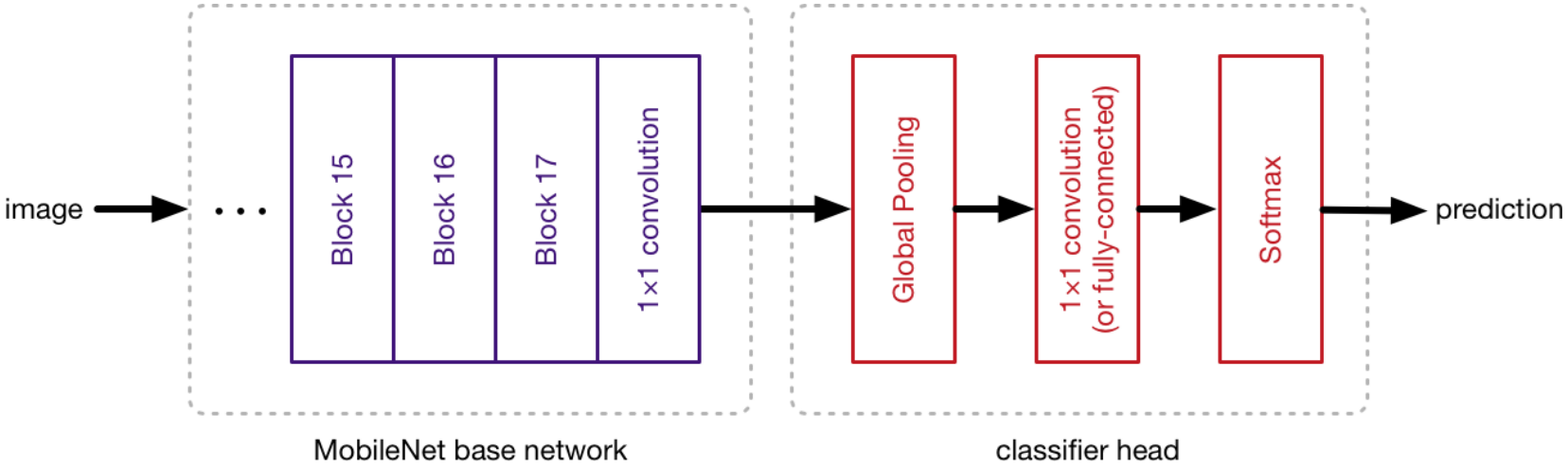
How MobileNet works

MobileNet, trained on ImageNet dataset.



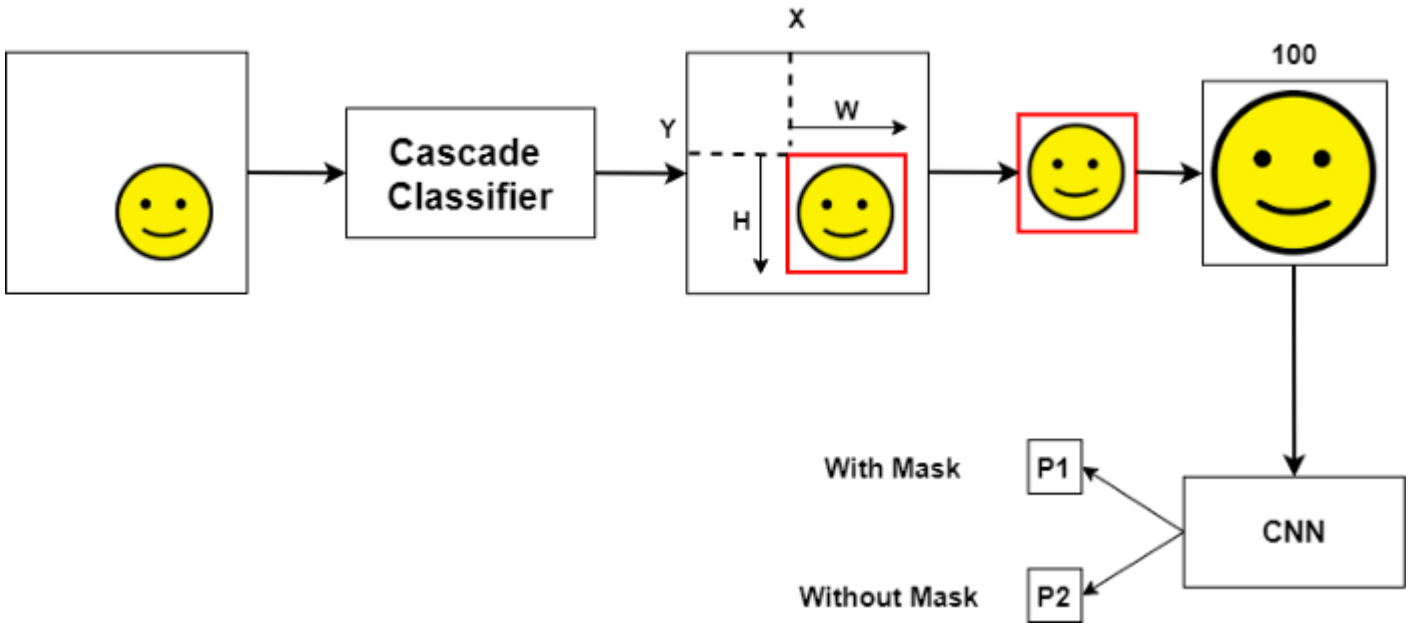
CNN architecture development, training, and testing

We are going to add our own layer of classifier on top of MobileNet.

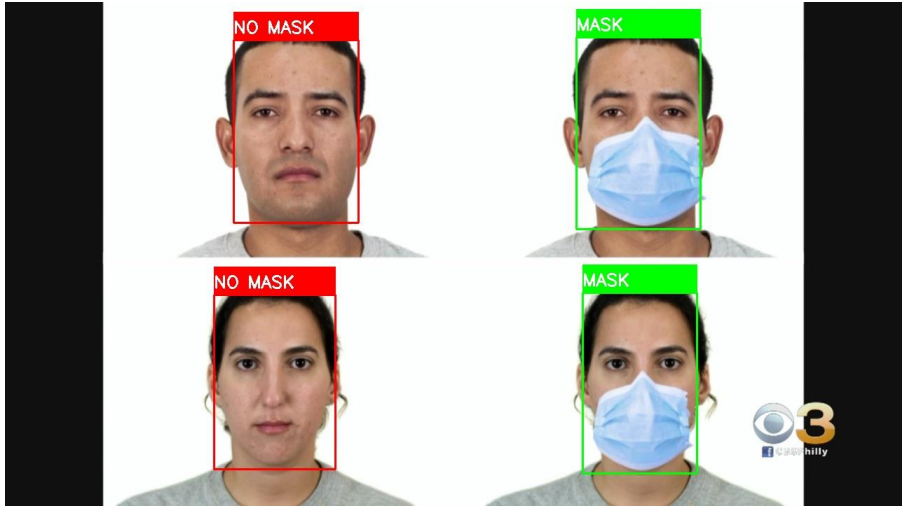


Model deployment for live webcam feeds

Images from Camera contains a lot of extra information than a simple Face.



Result



References

- Tensorflow
- Keras API
- MobileNet Research Paper
  https://arxiv.org/abs/1704.04861
- OpenCV