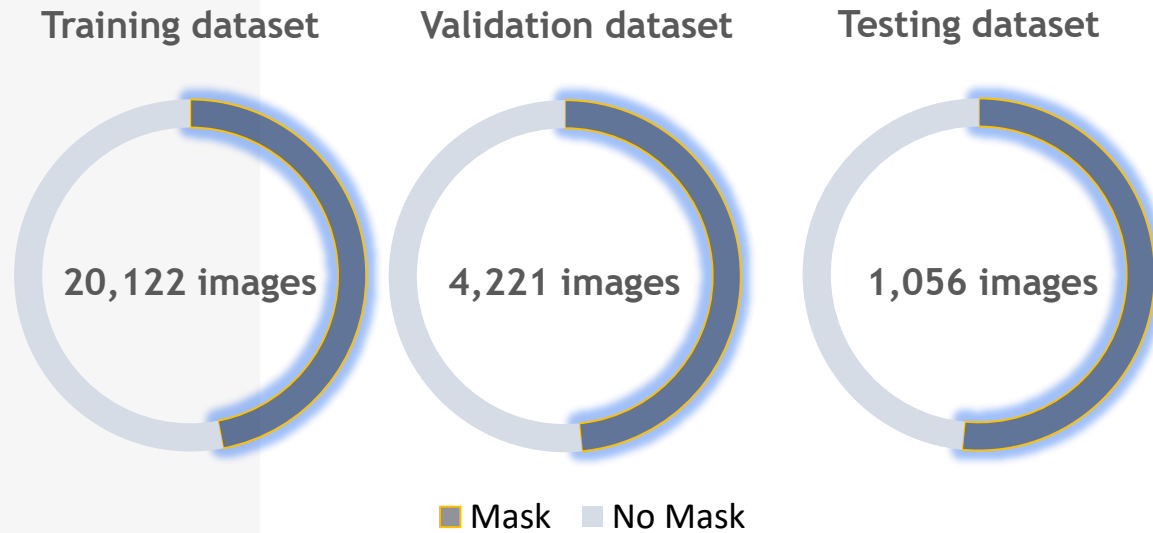# Project

Face Mask Detector

Motivation

- Wearing a face mask is generally accepted to be a simple but effective health and safety precautionary measure for slowing the spread of COVID-19.

- However forgetting to wear a mask, taking the mask off or wearing the mask incorrectly in vulnerable areas can threaten the safety of a given individual, their colleagues and co-workers.

- This project was done with the objective of developing a face mask detector that can help automatically monitor vulnerable areas and identify individuals not wearing a mask or the ones wearing a mask incorrectly such that they can be reminded not to do so in future!

Methodology

Collating the dataset

Training dataset	Validation dataset	Testing dataset
20,122 images	4,221 images	1,056 images

■ Mask ■ No Mask

Sources:
Dataset made available by Cabani et al used to create MaskedFace-Net
Face Mask Project of Mr. Thakshila Dasun - Google Drive Link

Methodology

2 Creating a CNN using "MobileNet V2" as a base

Data Augmentation layers

Google's MobileNet V2 –
Pre-Trained CNN

The top 74 layers of MobileNet V2 was unfrozen and re-trained to recognize masked and no mask or incorrectly masked images

Average Pooling layer

Flattening layer

Dense layer with 128 units and ReLU activation

Random dropout layer with a dropout rate of 20%

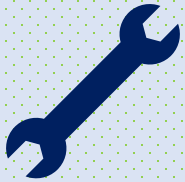Output layer with sigmoid activation function

Methodology

Compiling the CNN and Training

Learning Rate: $10e^{-5}$
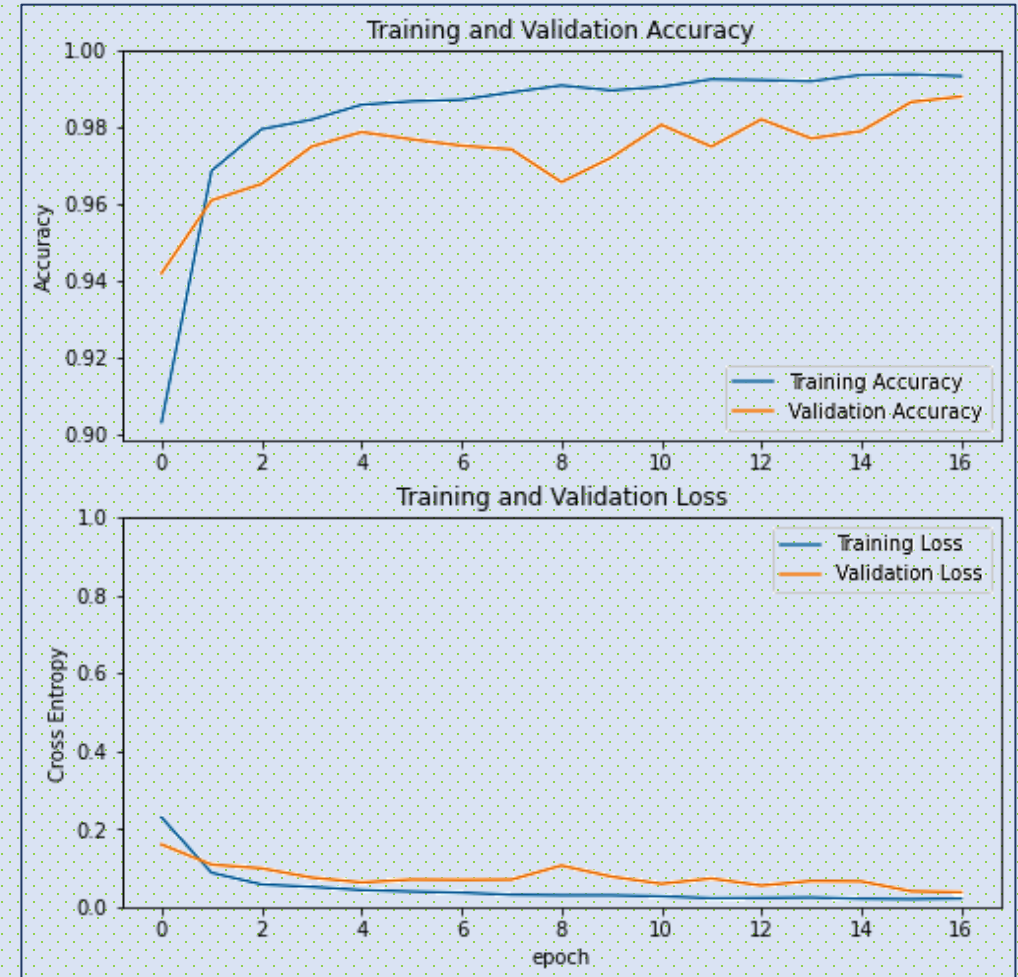
Optimizer: Adam

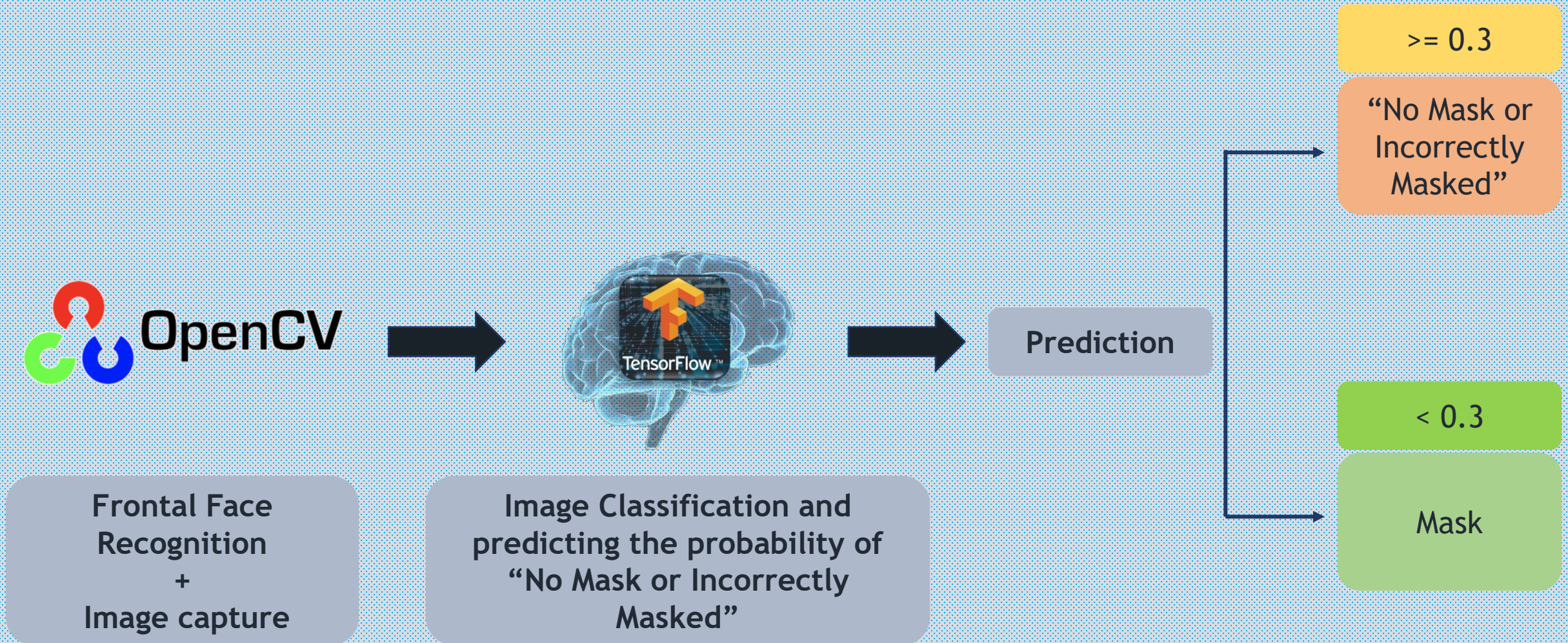Metrics: Accuracy

Epochs: 17

Methodology

Training Results

Training and Validation Accuracy

Training and Validation Loss

Methodology

Using Open CV - Python for face recognition

>= 0.3

"No Mask or Incorrectly Masked"

Prediction

< 0.3

Mask

Frontal Face Recognition + Image capture

Image Classification and predicting the probability of "No Mask or Incorrectly Masked"

Methodology

Using Multi-task Cascaded Convolutional Neural Network (MTCNN) for face recognition

>= 0.3

"No Mask or Incorrectly Masked"

MTCNN

Prediction

< 0.3

Frontal Face Recognition + Image capture

Image Classification and predicting the probability of "No Mask or Incorrectly Masked"

Mask