

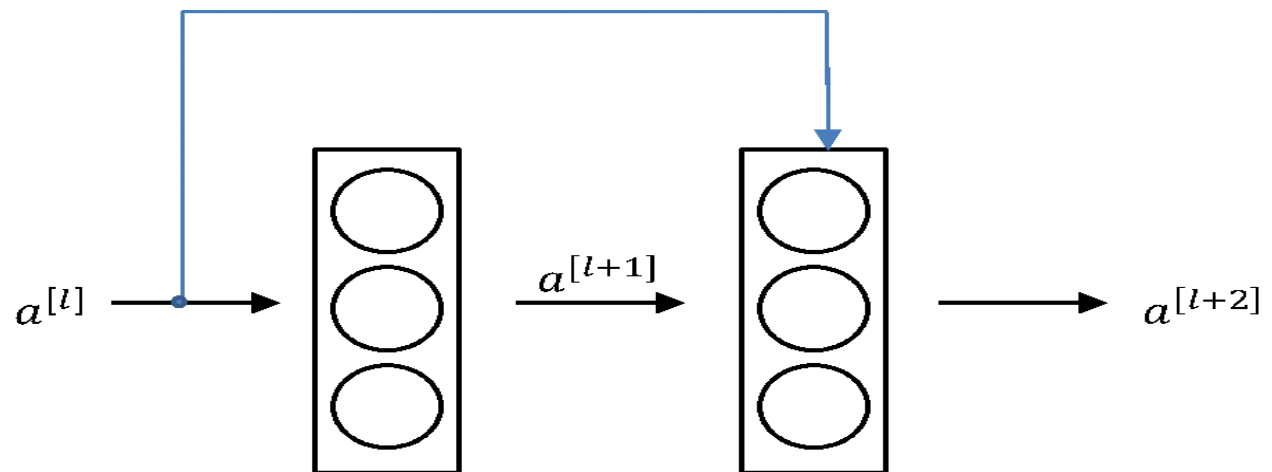
# Face Mask Detector



Capstone Project 2

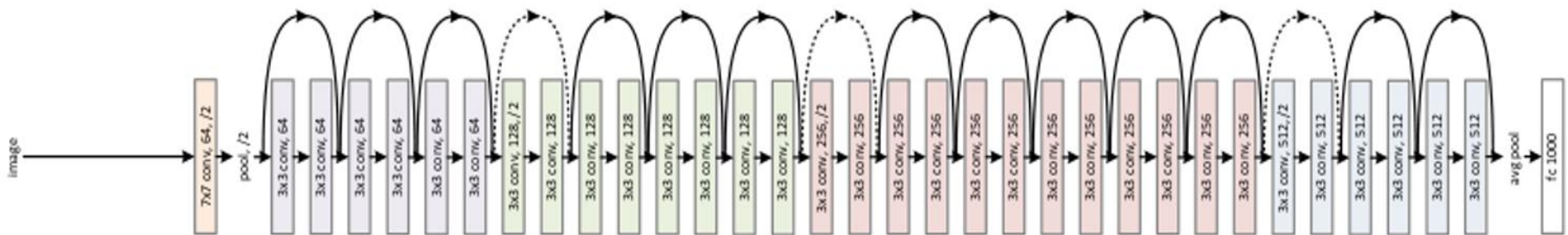
# Residual Networks

- ✂ An effective way to overcome the vanishing/exploding gradients problem to build deeper networks
- ✂ Uses skip connections in residual blocks in order to ensure the performance is not negatively affected in deeper neural networks



# Transfer learning

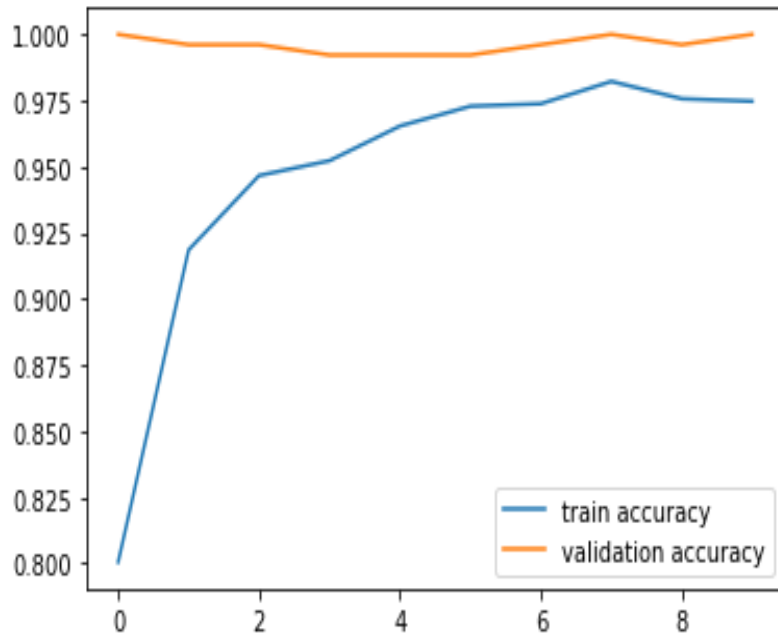
- Freezing the pre-trained weights, so the new data does not change the weights (or lowering the learning rate so the weights do not change drastically)
- Customize the model by building fully connected layers on top of the model and use an output according to the problem



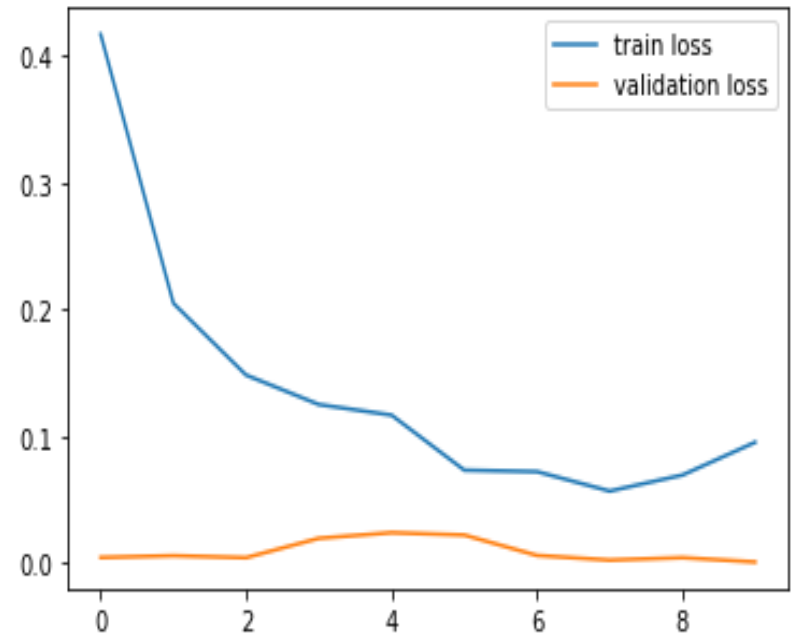
# Classification results

Accuracy and loss on the training and test set after 10 epochs

Accuracy

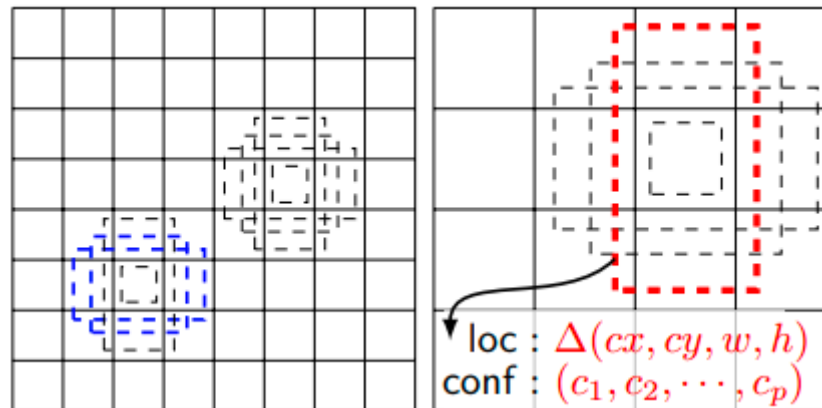


Loss

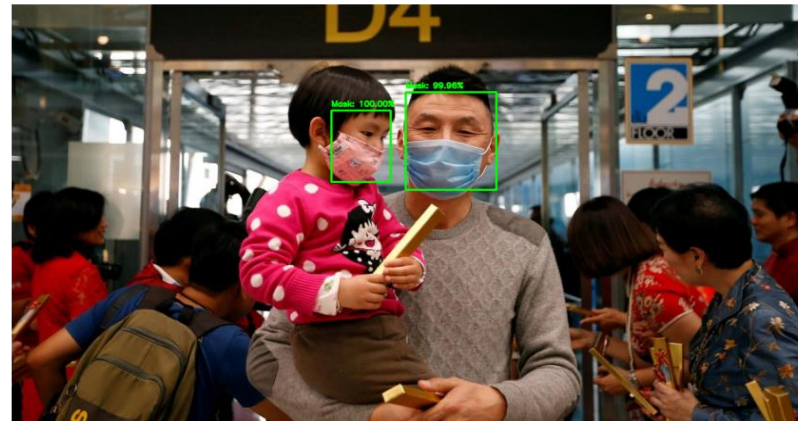
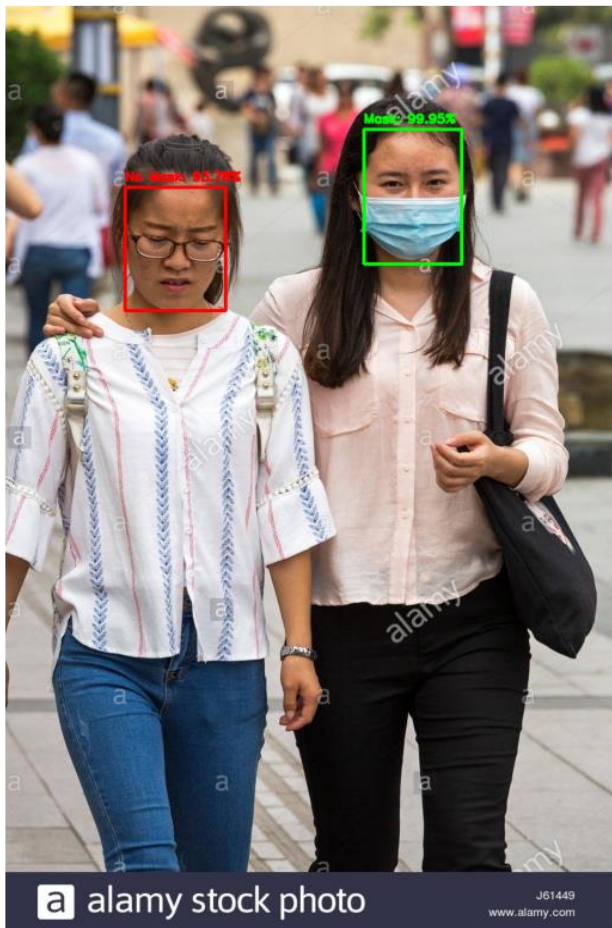


# Face Detection

- Several different face detection models can be used in OpenCV, like Haar feature or SSD models
- This project is built using SSD model, which can detect several objects in the image using one single shot, therefore is a fast algorithm and can be used in real time

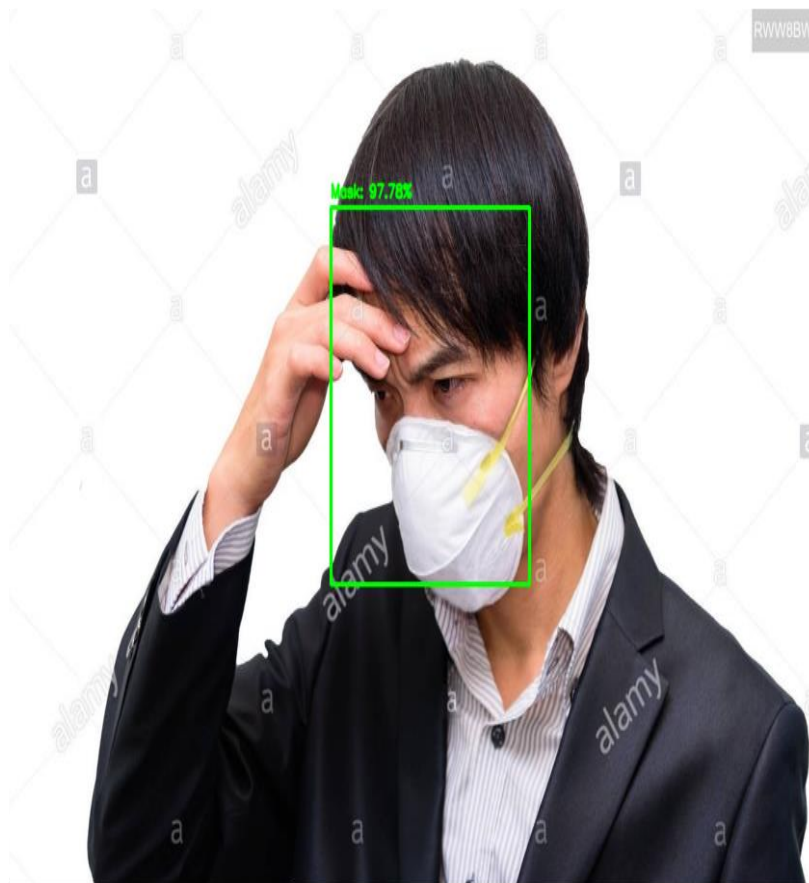


# Results





# Results



# TensorFlow Object Detection API

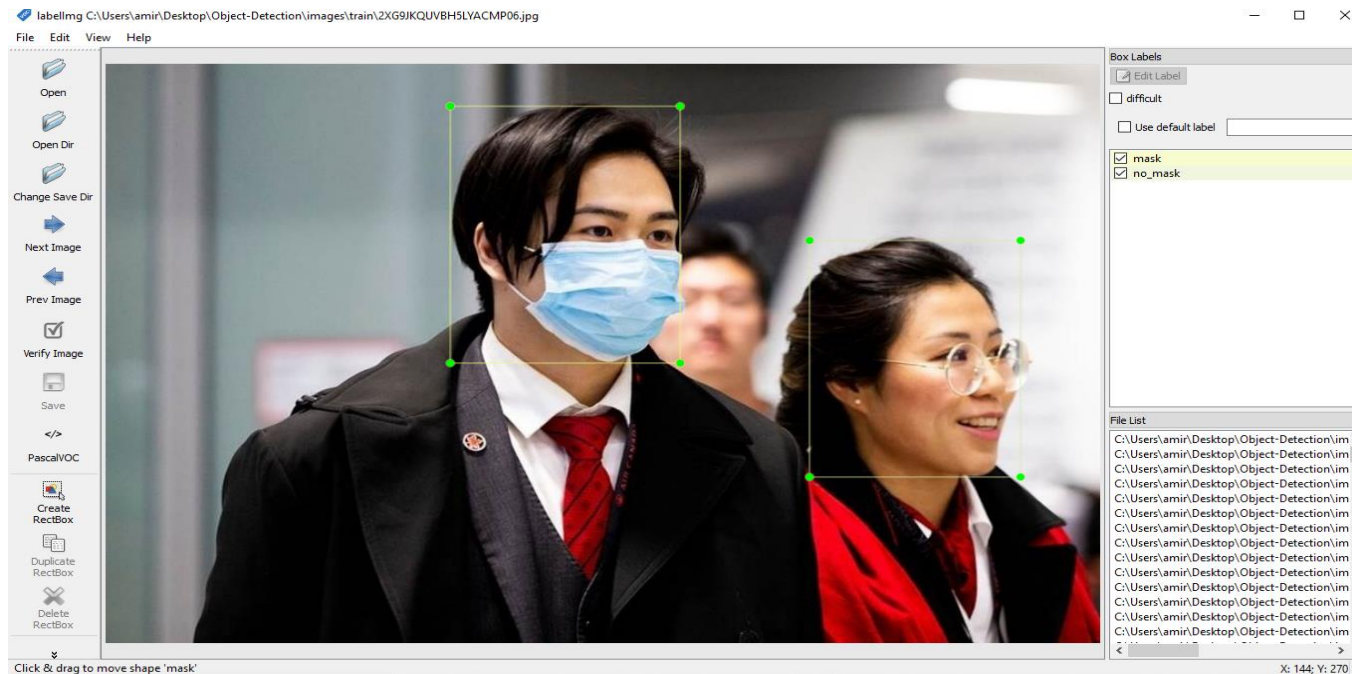
- 🌀 Preparing and labeling the data set
- 🌀 Generating tensorflow records
- 🌀 Training the model





# Preparing and labeling the data set

- 🌀 A data set of almost 165 images of people with or without face mask
- 🌀 Annotate the images using labeling software
- 🌀 Generate TFRecord format files



# Training the model

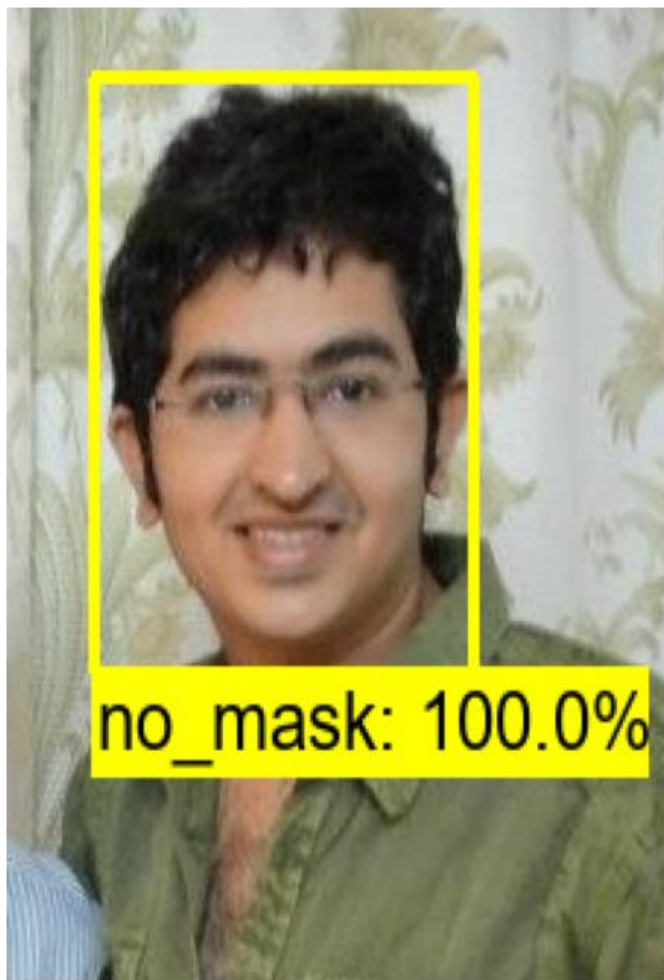
- ✎ Selecting a model from numerous model existing in TensorFlow Model Zoo
- ✎ Change the config file to match the specifics of the situation
- ✎ Training the model
- ✎ Export the model before it can be used

# Results

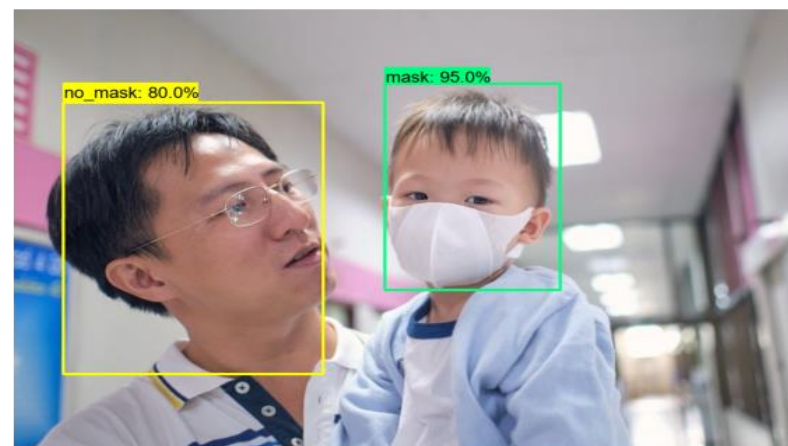




# Results

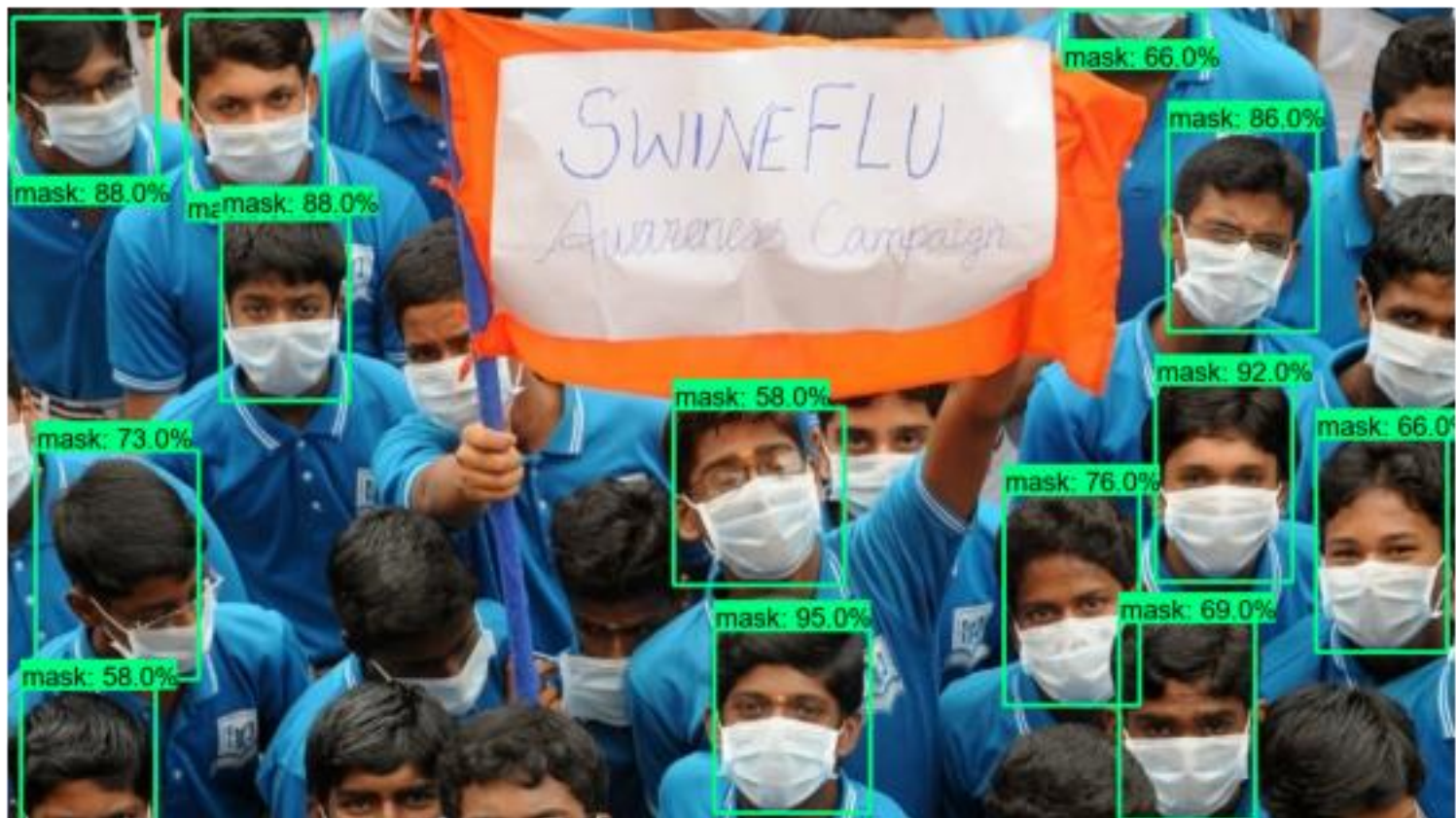


# Results





# Results





Thank you!