

**Mask Wear Detector**

Project Architecture

Domain: Deep Learning Technology (Computer Vision)

Creator: Mahammad Ojagzada

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Baku, Azerbaijan

+994 50 4918219

[mahammad.ojagzada@outlook.com](mailto:mahammad.ojagzada@outlook.com)

**Architecture**

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**Architecture Description**

**Data Preparation**

Data Description

COVID-19 pandemic has rapidly affected our day-to-day life disrupting the world trade

and movements. Wearing a protective face mask has become a new normal. In the near

future, many public service providers will ask the customers to wear masks correctly to

avail of their services. Therefore, face mask detection has become a crucial task to help

global society.

COVID-19 mask detector could potentially be used to help ensure your safety and the

safety of others.

Importing dataset

We downloaded the dataset from github.com/cabani/MaskedFace-Net. There are 67,049 images with Correctly Masked Face Dataset (CMFD) at 1024×1024 and 66,734 images with Incorrectly Masked Face Dataset (IMFD) at 1024×1024. However, for time limit, I used only one folder of correctly and incorrectly Masked Face Dataset. Overall, i used 1143 images for training and 286 images for validation.

Data Visualization

Using matplotlib, we visualized images with 4x4 configuration.

Data Preprocessing

In data preprocessing step, using ImageDataGenerator we scaled, shuffled, inserted target size, which was 150x150, and chose appropriate class mode (binary) with specified batch size.

**Model Development**

Model implementation

As we had very few data for reliable model output, I used Transfer Learning method with InceptionV3 model. I imported local weights for the model with TensorFlow Hub. The final model comprised Dense layer with sigmoid activation function. The model is compiled with RMSprop optimizer (learning rate= 0.0001) and Binary Cross Entropy loss function.

Model Prediction

The model was trained with 6epochs. Training process ended with 99.36% accuracy and 0.0285 loss on training dataset and 98.97% accuracy, 0.0396loss on validation dataset. Model was saved as “.h5” file. At the end, I saved the as 'model\_v1.h5'.

Real time face mask detection

That was the interesting part of all coding part. I used my webcam to test the results and the model very well on real time face mask prediction very well. The important point is that using ‘haarcascade\_frontalface\_default.xml’, the model is able to identify faces.