Face Mask Detection

Agenda

- Problem Statement & Framework(s) used
- Dataset
  - Datasets used & distribution
  - Data Augmentation
- Model setup
- Model Evaluation and results
- Model Deployment

Problem statement

- Imagine a scenario where a state-of-the-art AI system automatically monitors and identifies individuals not wearing masks in real-time.
- This technology can enhance public safety measures, streamline enforcement efforts, and contribute to healthier communities.
- By leveraging advanced Deep learning techniques and robust neural networks architectures, this project aims to develop an automated solution for mask detection using computer vision.

Frameworks used

OS

TensorFlow

After version 2.11 , TF don’t support GPUs on windows , use Linux instead

Dataset (datasets used & distribution)

4 data sets were used:

MaskNet dataset (133,782 images)

Face Mask Lite (20,000 images)

Real-time-face-mask-detection (11,042 images)

Face Mask Detection ~12K Images Dataset (11,792)

Train

Validation and **test**

5400

5482

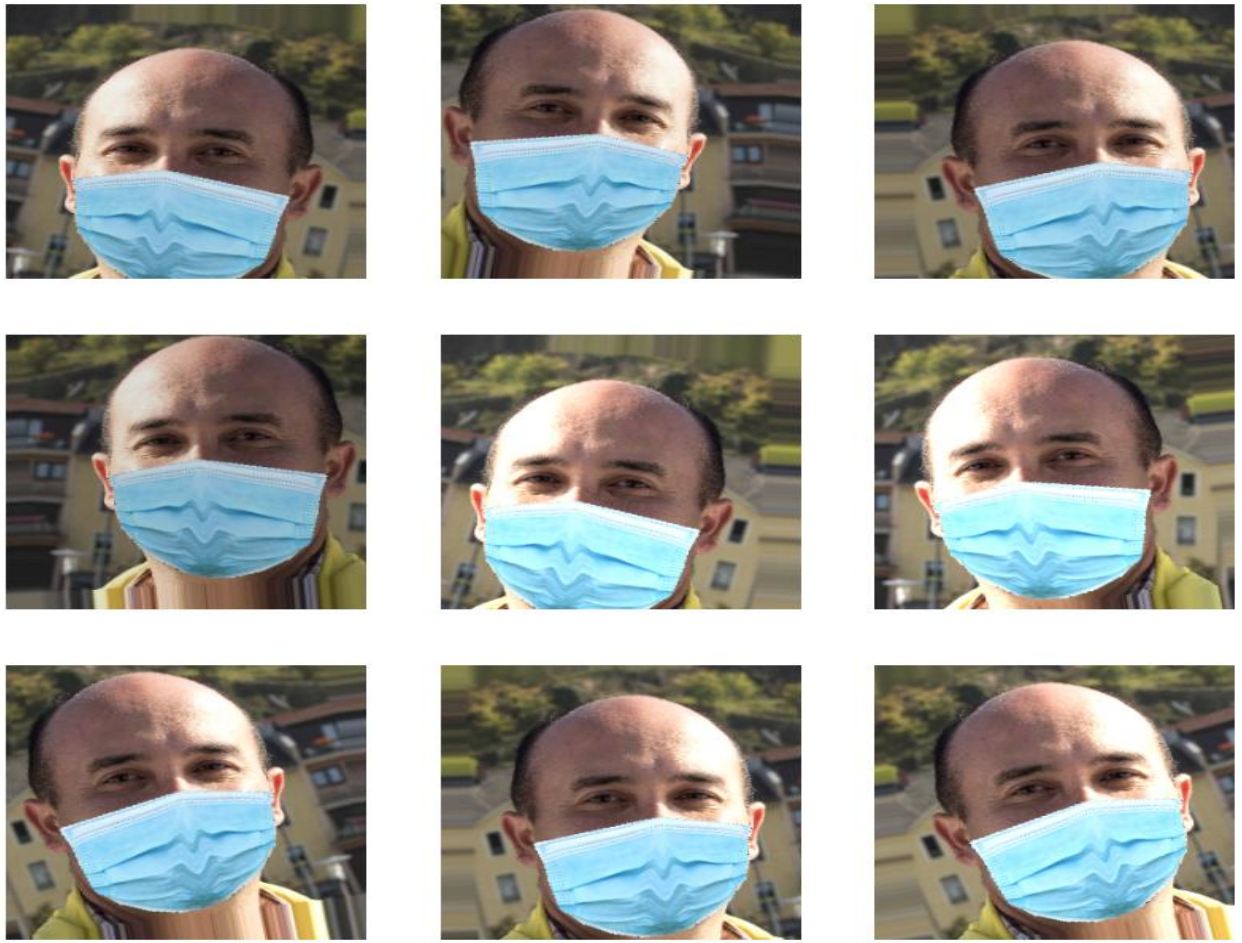
Total images :

176,616

Dataset Distribution

93.36% Train , 3.10% Validation , 3.06% Test

Dataset (Data Augmentation)



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- height_shift_range=0.1,
- horizontal_flip=True,
- brightness_range=[0.8, 1.4],
- shear_range=0.2,
- channel_shift_range=0.1

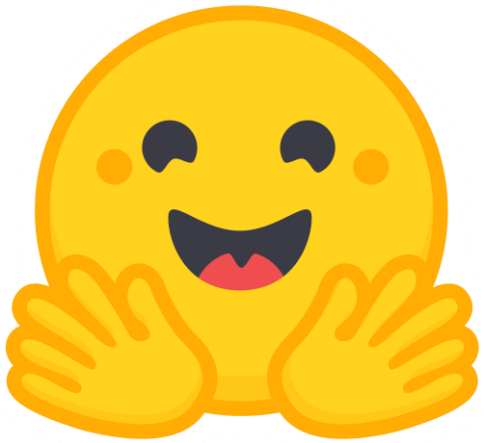
Model Setup

- ResNet50V2 pretrained architecture
  - *Avg pooling layer*
  - *128 neuron layer*
  - *Drop out (0.5)*
  - *Output layer for binary classification*
- **Batch size** : 32
- **Optimizer** : Adam
- **Learning rate** : 0.001
- **Loss function** : binary cross entropy
- **Early stopping** : patience set to 5 (val_loss)
- **Epochs** : 40

Model Evaluation

	Accuracy	Loss
Train	0.9993	0.0026
Validation	0.9619	0.1490
Test	0.9775	0.0676

Model Deployment



Streamlit

Thank You !