Report for Artificial Intelligence

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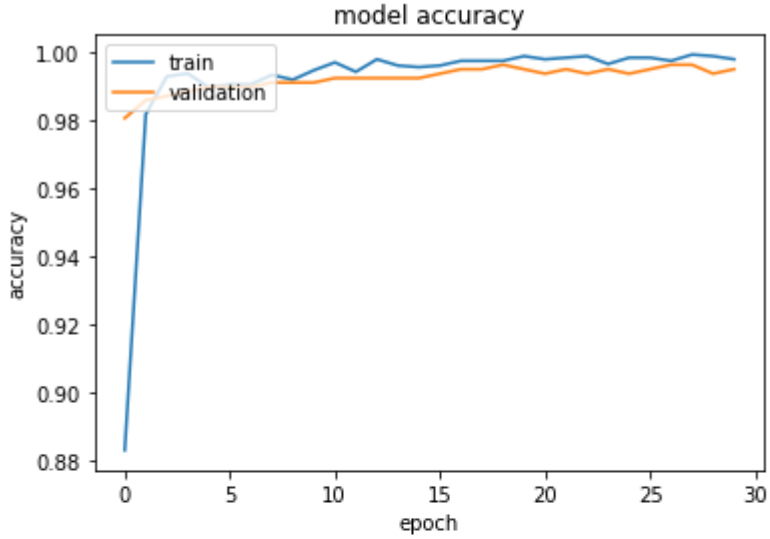
Abstract

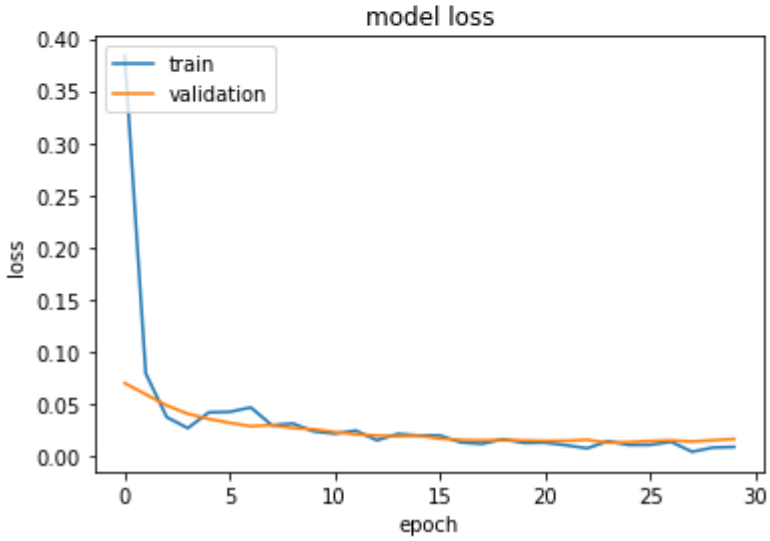
Coronavirus disease (COVID-19) has significantly affected the daily life activities of people globally. To prevent the spread of COVID-19, the World Health Organization has recommended people to wear face masks in public places. Manual inspection of people for wearing face masks in public places is a challenging task. We deploy a computer vision and deep learning framework to recognize if people wears or not mask.

The program we have implemented had 2 important parts: The first one is to recognize the face of a person, and to do that we use python with opencv libraries.

The second part of our project regards the model we use to estimate if a person is wearing a mask. We used the RES-Net 50V2 convolution neural network to create and train our model. Since the model created is very heavy we had to fine-tune it in order to implement it in our program.

The RES-Net 50 model that we created works really well with the dataset that we have used. We split data in 60 - 20 - 20 train-validation-test and the accuracy of the test set is 0.98.



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Accuracy on the Test Set :  0.9934810951760105
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roba usata per il crop dell'immagine, (?)
conclusioni

Future works: Since our model is heavy, also the fine-tuned one, it is possible that not all the device are able to compute it in a reasonable amount of time. In order to develop a program that may be used in a more heterogeneous amount of device we have found other models, thinner than

Resnet50 V2, that may be implemented to scan face faster. This model is called MobileN.

Bibliography:

1) Face mask recognition system using CNN model https://www.sciencedirect.com/science/article/pii/S277252

2) A novel DeepMaskNet model for face mask detection and masked facial recognition https://www.sciencedirect.com/science/article/pii/S1319157821003633

3) COVID-19 Face Mask Recognition with Advanced Face Cut Algorithm for Human Safety Measures https://arxiv.org/abs/2110.04316

4) Faster Region-based Convolutional Neural Network for Mask Face Detection https://ieeexplore.ieee.org/document/9651744

5) Mask wearing detection method based on SSD-Mask algorithm https://ieeexplore.ieee.org/document/9443800

6) Face mask detection using deep learning: An approach to reduce risk of Coronavirus spread https://www.sciencedirect.com/science/article/pii/S1532046421001775

7) The Face Mask Detection For Preventing the Spread of COVID-19 at Politeknik Negeri Batam https://ieeexplore.ieee.org/document/9350556

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