FACE MASK DETECTION

Detailed Project Report

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PROJECT DETAILS

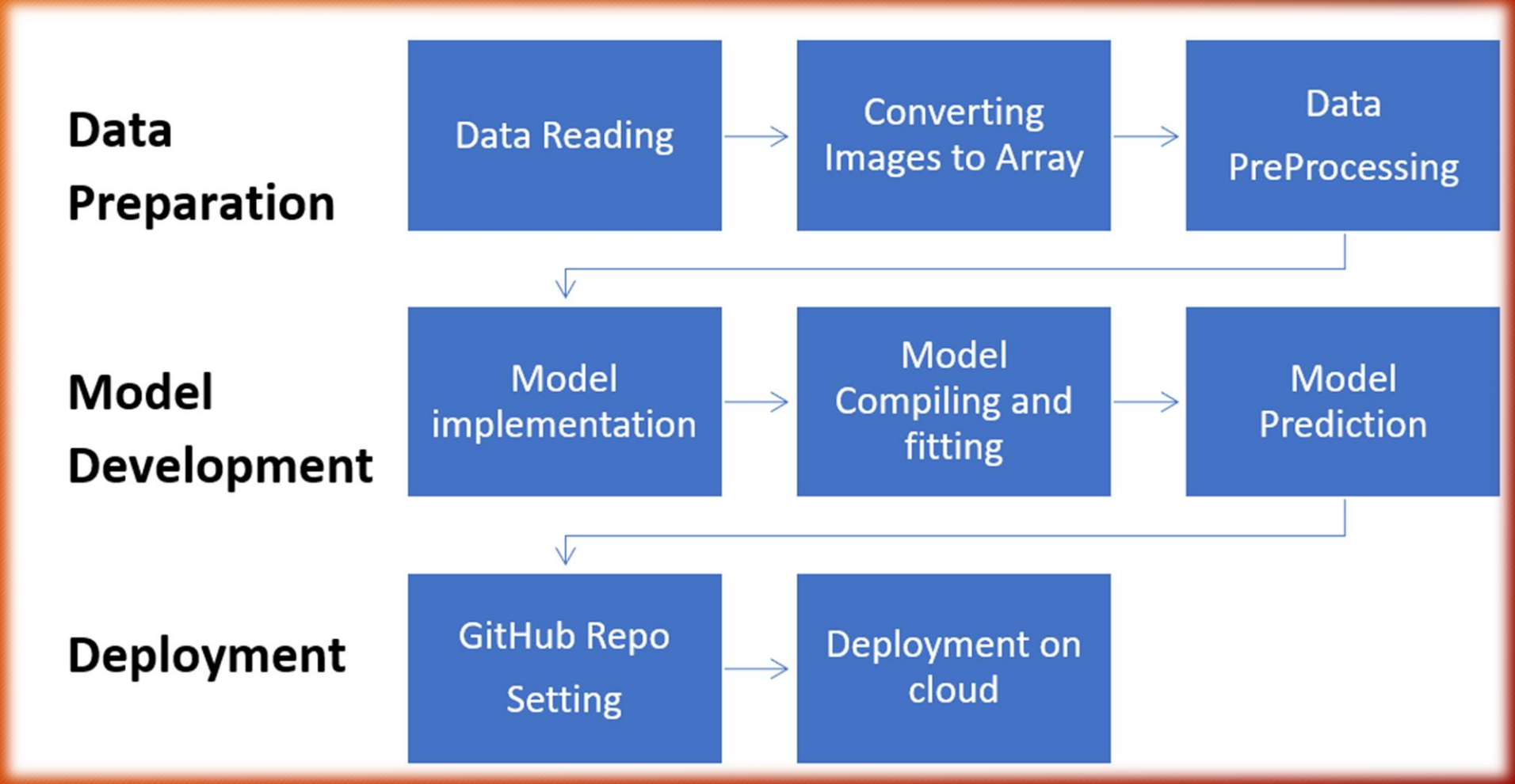
- Project Title : Mask Wear Detector
- Technologies : Deep Learning Technology (Computer Vision)
- Domain : Safety and Security
- Project Difficulties level : Intermediate

- Programming Language Used Python

PROBLEM STATEMENT

- 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.

ARCHITECTURE



MODEL USED

FACE MODELS

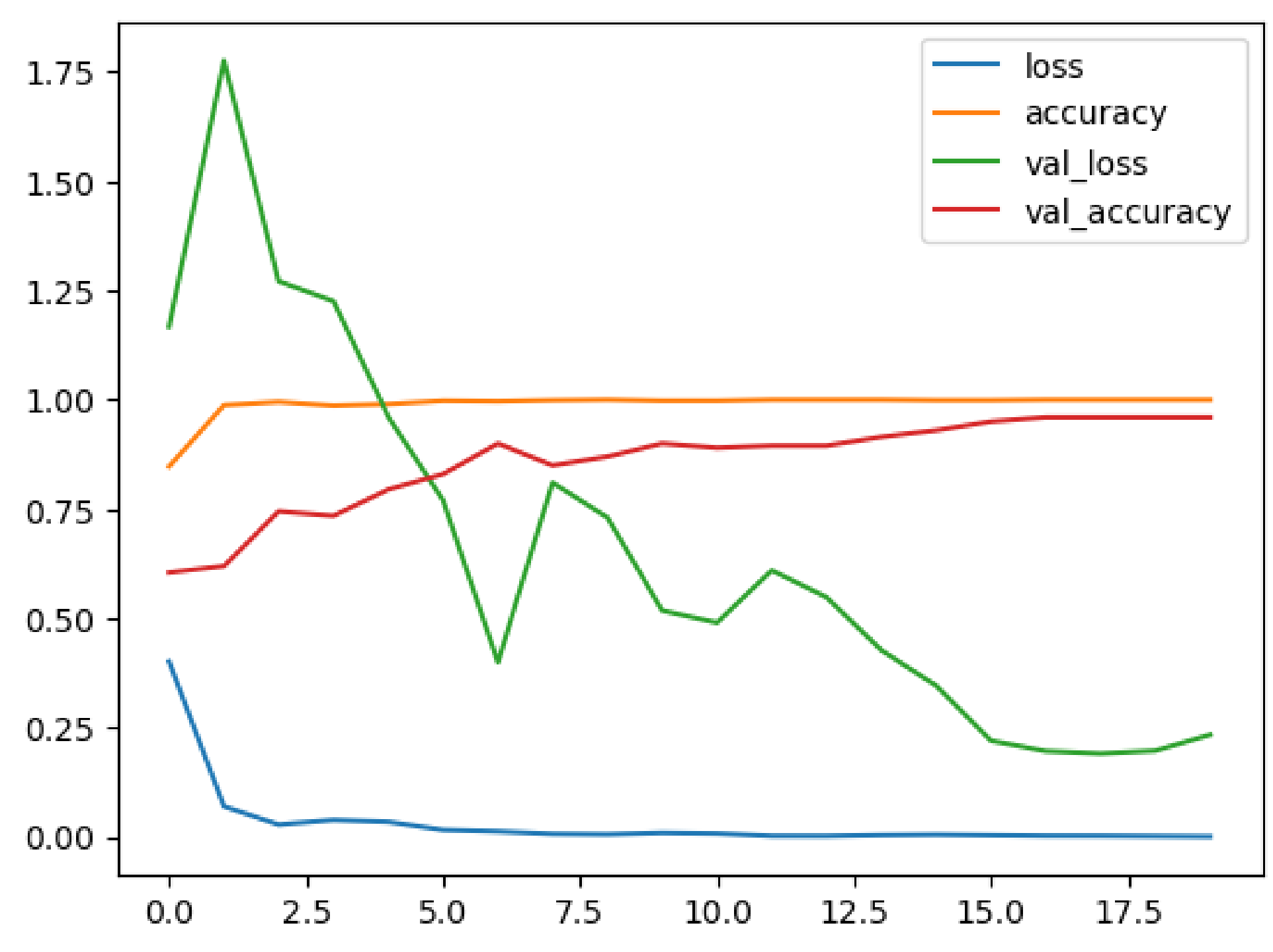
prototxt = r"../artifacts/FaceModels/deploy.prototxt"
weights = r"../artifacts/FaceModels/res10_300x300_ssd_iter_140000.caffemodel"

1.prototxt is the path to the deploy.prototxt file, which contains the network architecture or model definition. It defines the structure of the deep learning model, including the layers, their configurations, and the flow of data.
2.weights is the path to the .caffemodel file, which contains the pre-trained weights of the face detection model. These weights are learned during the training process and contain the knowledge necessary for the model to perform face detection accurately.
3.cv2.dnn.readNet(prototxt, weights) loads the model architecture and weights using OpenCV's deep neural network (dnn) module. The readNet function reads the model from the specified prototxt and weights files, and creates a network object called Face_Model. This network is now ready to perform face detection tasks.

MODEL USED (MASK MODEL)

- **Base Model:**
- The base model is a pre-trained convolutional neural network (CNN), which is used for feature extraction from input images. It is not explicitly shown in the code, but it is assumed to be initialized earlier with a pre-trained CNN, such as VGG, ResNet, or MobileNet. The specific base model used is referenced by baseModel.

- **Head Model:**
- The head model is the custom part of the network that is added on top of the base model. It takes the output of the base model and further processes it to perform mask detection. Here's a breakdown of the head model architecture:
- The model is designed to take an input image, process it through the base model for feature extraction, and then pass the extracted features through the head model to predict whether the person in the image is wearing a mask or not. This type of architecture is commonly used for transfer learning, where a pre-trained base model is combined with a custom head model for a specific task.



TRAINING METRICS PLOT

THANKS FOR LISTENING