College name : Computer science and artificial intelligence

Course name : Selected CS-2

Team number : 25

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(Paper Details)

-Paper Name : Human Gender Detection from Facial Images Using Convolution Neural Network

-Publishers Name : Tahmina Akter Sumi , Mohammad Shahadat Hossain , Raihan Ul Islam , and Karl Andersson

-Year Of Publication : AG 2021

- The Datasets used on this paper : 2 dataset which are Kaggle dataset and Nottingham Scan Database

-The Implemented Algorithm : Convolution Neural Network (CNN)

-The Results : After implementation, a highest accuracy 97.44% has been gained using Kaggle dataset and 90% has been gained using No

1) General Information on the selected dataset

-Name of the dataset used: Gender Classification Dataset

-The link of dataset: [Gender Classification Dataset | Kaggle](#)

-The total number of samples in the dataset: 3 samples

-Dimension of images (96 , 96)

-Number of classes & their labels : 2classes

with labels (female , male)
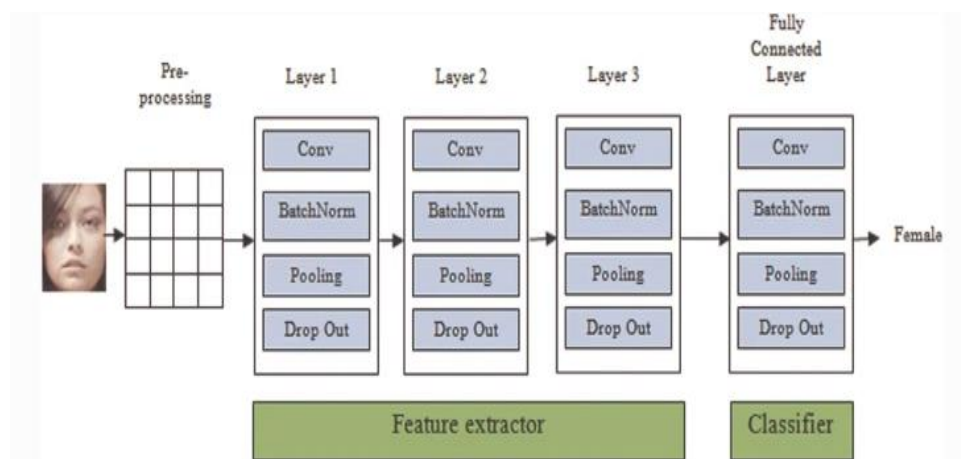
2) Implementation details:

- The ratio used for training, validation, and testing :

Training (85% of the training dataset) = 39959 images

 Validation (15% of the training dataset) = 7050 images

Testing (100% of the testing dataset)=11649 images

-The Block Diagram

-The hyperparameters used in the model

```
In [30]: #the model
         image_input = Input(shape=(96,96,3))

         #The first CNN layer followed by Relu and MaxPooling layers
         x = Conv2D(32,(3,3),activation = "relu")(image_input)
         x = BatchNormalization()(x)
         x = MaxPooling2D((2,2))(x)
         x = Dropout(0.2)(x)

         #The second CNN layer followed by Relu and MaxPooling layers
         x = Conv2D(64,(3,3),activation = "relu")(x)
         x = BatchNormalization()(x)
         x = MaxPooling2D((2,2))(x)
         x = Dropout(0.2)(x)

         #The third CNN layer followed by Relu and MaxPooling layers
         x = Conv2D(128,(3,3),activation = "relu")(x)
         x = BatchNormalization()(x)
         x = MaxPooling2D((2,2))(x)
         x = Dropout(0.2)(x)

         #The Flatten layer
         x = Flatten()(x)

         #The Dense layer
         x = Dense(256,activation="relu")(x)
         x = BatchNormalization()(x)
         x = Dropout(0.5)(x)

         #The Final layer with two outputs for two categories
         image_output = Dense(2,activation="softmax")(x)

         model = Model(image_input,image_output)
```
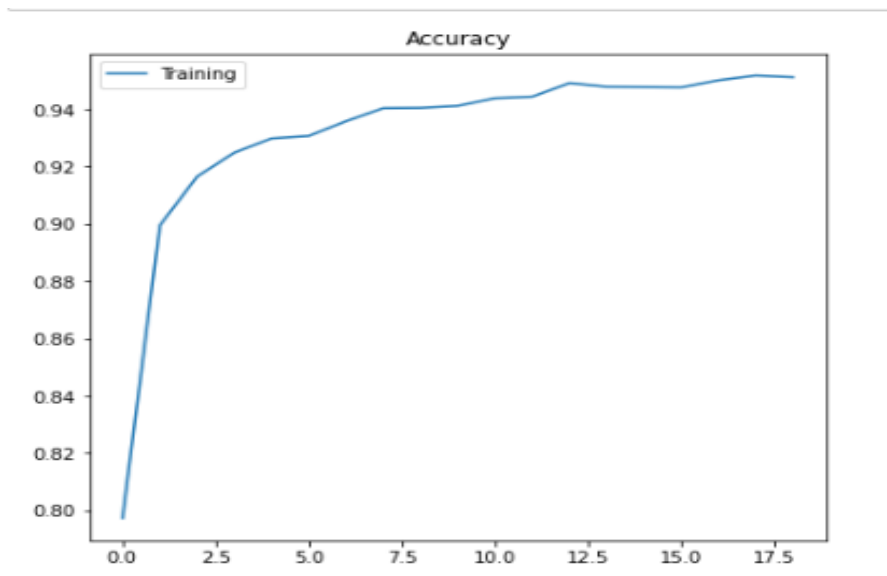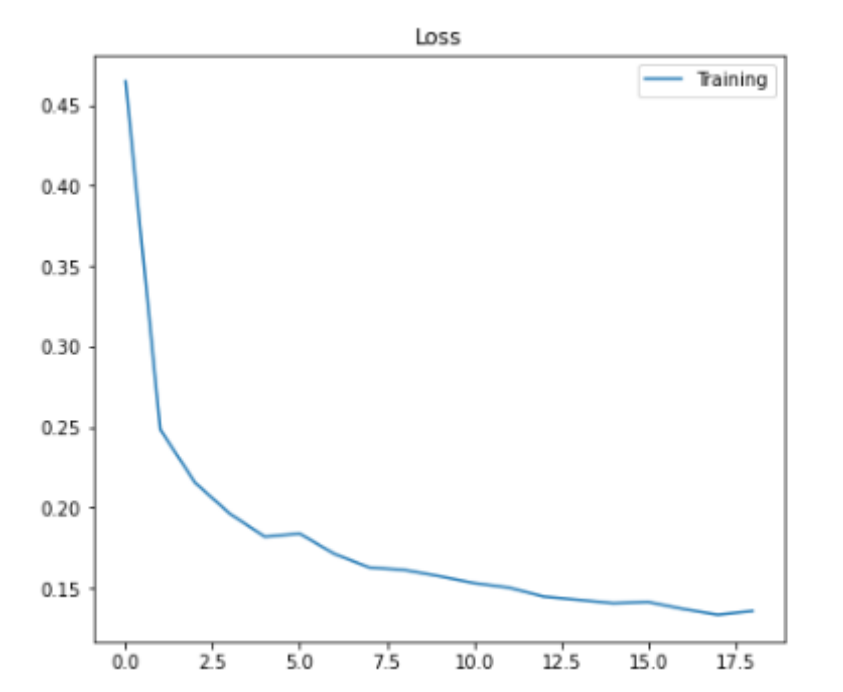
3) Results details:

- The Accuracy : 96%

- The loss : 4%

Loss

- The classification report

```
In [25]: print(classification_report(predicted,y_test))

                       precision    recall  f1-score   support

                   0       0.99      0.93      0.96      6243
                   1       0.92      0.99      0.95      5406

            accuracy                           0.96     11649
           macro avg       0.96      0.96      0.96     11649
        weighted avg       0.96      0.96      0.96     11649
```

- The Confusion Matrix