بسم الله الرحمن الرحيم

ML Project 2024 of “Machine Learning”

Submitted by:

Name:	ID:
Ahmed Ali Ahmed Ismail	20206005
Mohamed Alaa Mohamed	20206068
Yassin Magdy Abdulghani	20206087
Youssef Abdelrahman Youssef	20206094
Omar Waleed Zenhom	20206130

Group:

Group 1

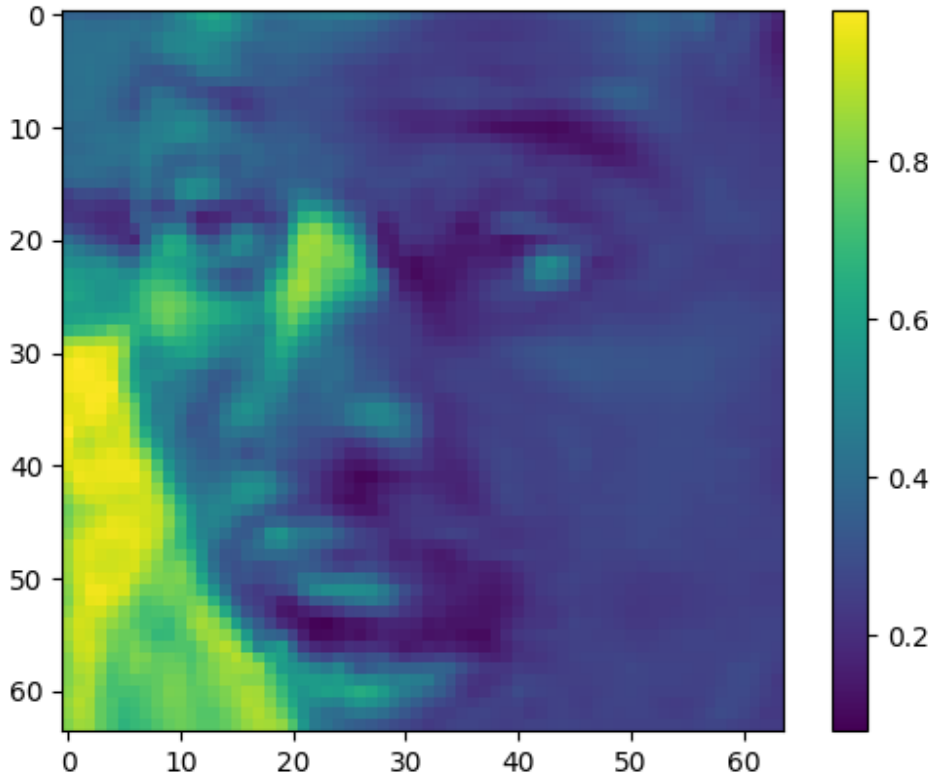
S4

The Chosen Dataset:
https://www.kaggle.com/datasets/cashutosh/gender-classification-dataset

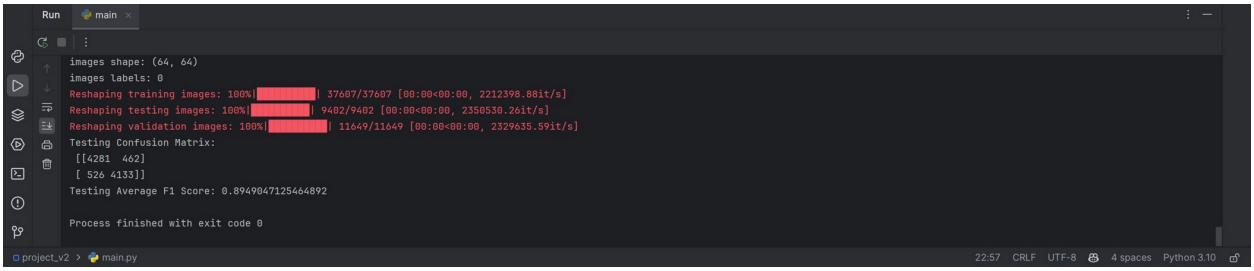
Gender Classification Dataset

Code and Graph Screenshots:

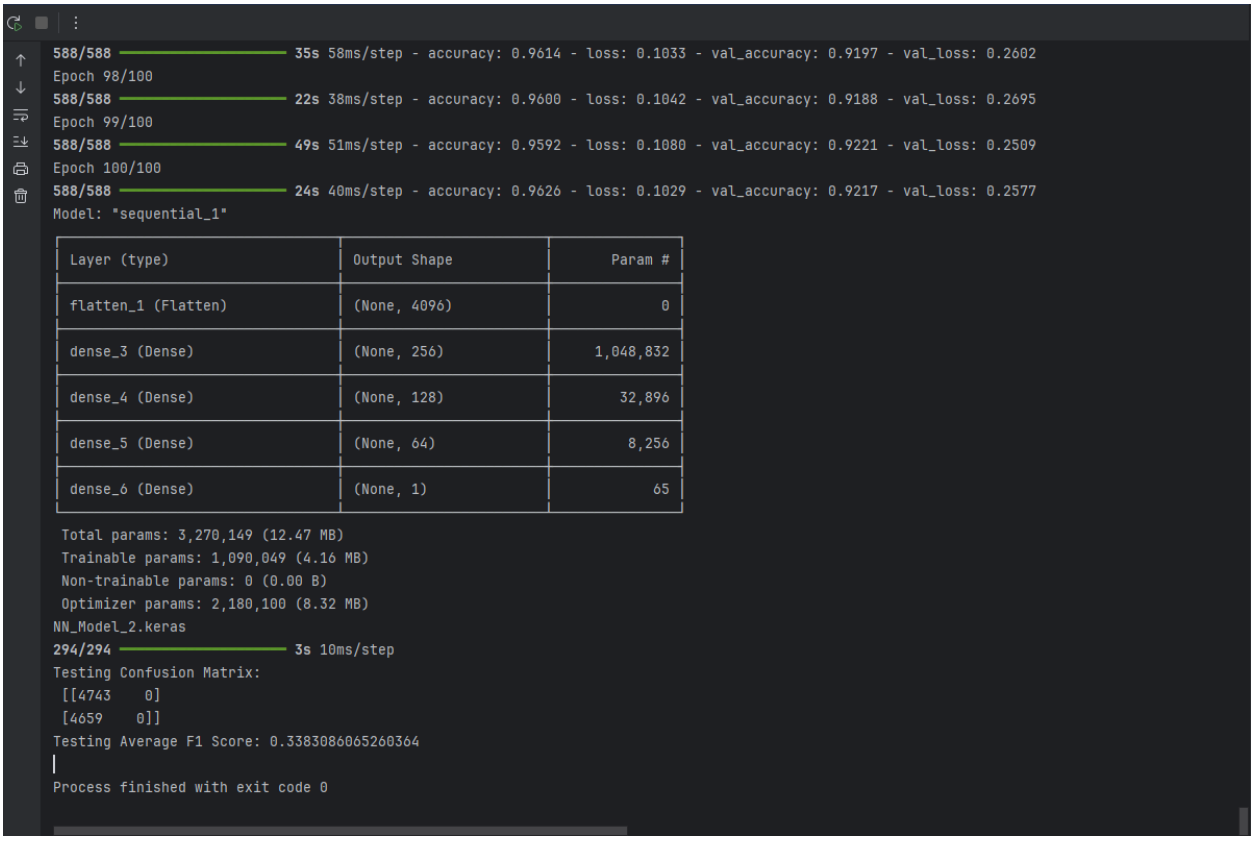
Image Plotting:



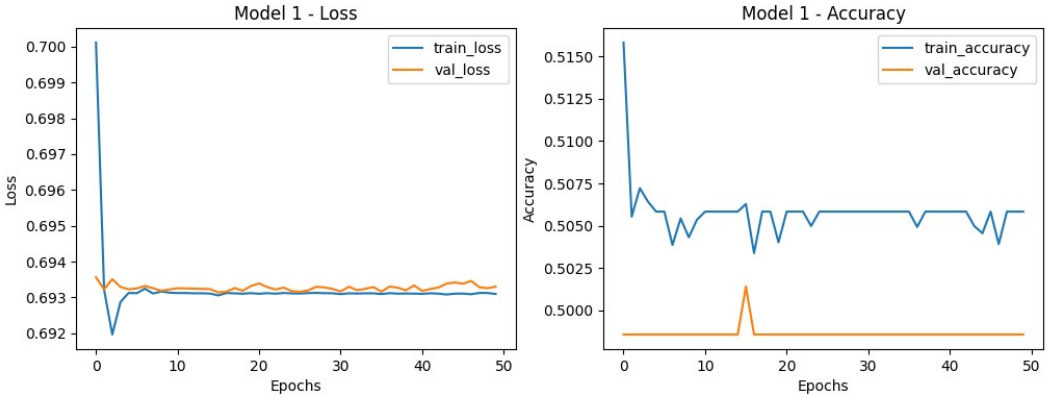
SVM Output:



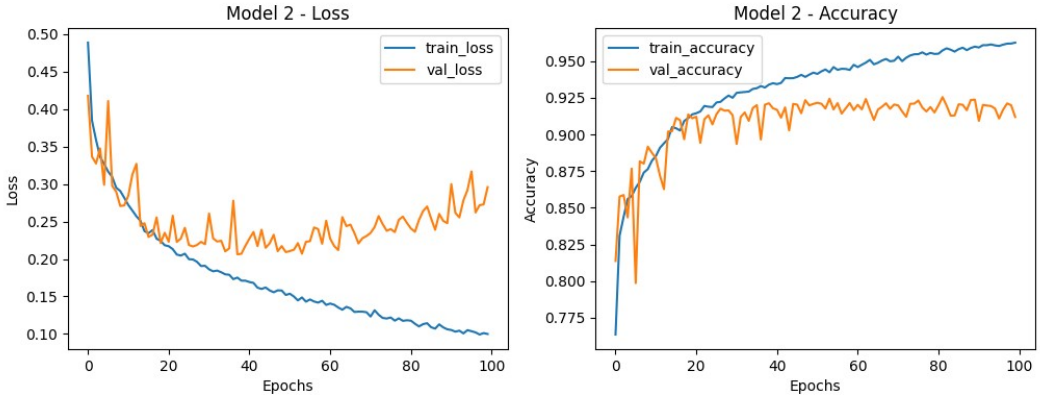
BEST NN Model 2 Output (epochs = 100):



NN Model 1:



NN Model 2:



CNN Best Model (RGB) Output (epochs = 50):

```
1176/1176 ━━━━━━━━━━━━━━━━━━━━ 58s 50ms/step - accuracy: 0.9953 - loss: 0.0126 - val_accuracy: 0.9624 - val_loss: 0.2866
Epoch 50/50
1176/1176 ━━━━━━━━━━━━━━━━━━━━ 61s 52ms/step - accuracy: 0.9952 - loss: 0.0153 - val_accuracy: 0.9613 - val_loss: 0.2894
Model: "sequential_1"
```

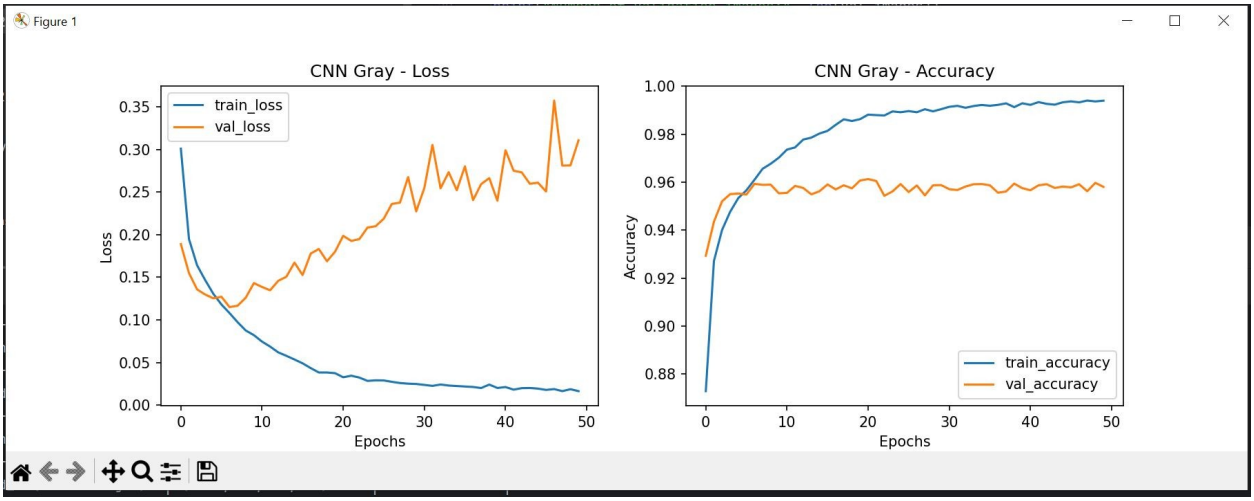
Layer (type)	Output Shape	Param #
conv2d_2 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_2 (MaxPooling2D)	(None, 31, 31, 32)	0
conv2d_3 (Conv2D)	(None, 29, 29, 64)	18,496
max_pooling2d_3 (MaxPooling2D)	(None, 14, 14, 64)	0
flatten_1 (Flatten)	(None, 12544)	0
dense_2 (Dense)	(None, 128)	1,605,760
dropout_1 (Dropout)	(None, 128)	0
dense_3 (Dense)	(None, 1)	129

```
 Total params: 4,875,845 (18.60 MB)
 Trainable params: 1,625,281 (6.20 MB)
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 3,250,564 (12.40 MB)
```

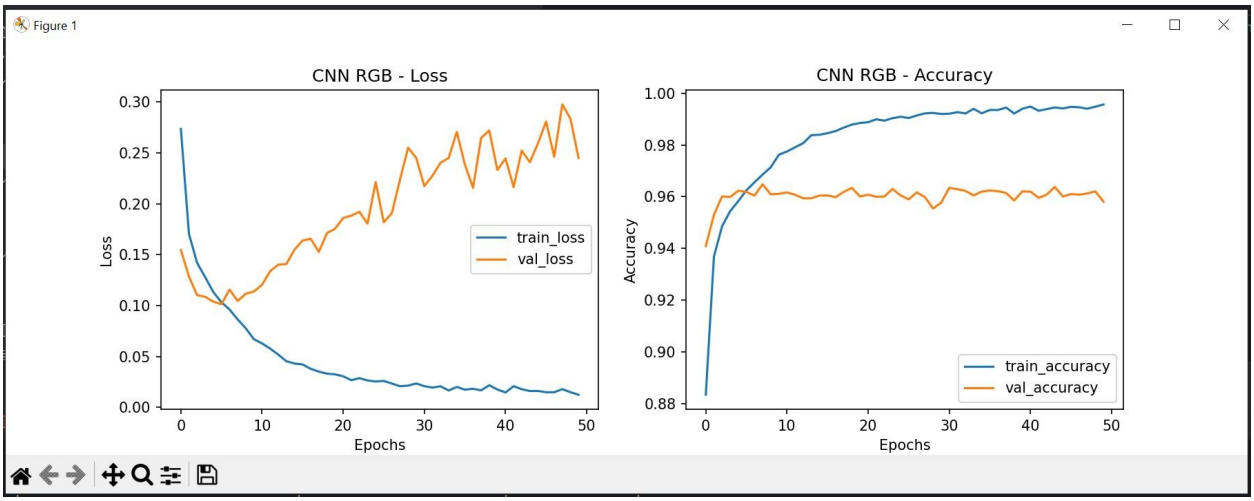
```
 Non-trainable params: 0 (0.00 B)
 Optimizer params: 3,250,564 (12.40 MB)
CNN_RGB.keras
294/294 ━━━━━━━━━━━━━━━━━━━━ 2s 8ms/step
Testing Confusion Matrix:
 [[4775    0]
 [4627    0]]
Testing Average F1 Score: 0.3421150355181446

Process finished with exit code 0
```

CNN (Gray) Model:



CNN (RGB) Model:



Best Model based on the results:

SVM Model with Accuary ~= 0.89