

kaggle.com/code/sarahabo/atividade-2-cnn-classifica-o-de-imagens/edit

Beginner Levels - L... LIVE STREAMING

Atividade 2 - CNN Classificação de Image...

Draft saved

File Edit View Run Add-ons Help

Code

history = model.fit(x_train_images, train_labels, batch_size=120, epochs=10, validation_split=0.2)

shuffle A.* 2/2

Epoch 1/15
25/25 [=====] - 188s 8s/step - loss: 2.8177 - accuracy: 0.1904 - val_loss: 1.6494 - val_accuracy: 0.2188
Epoch 2/15
25/25 [=====] - 186s 7s/step - loss: 1.6386 - accuracy: 0.1938 - val_loss: 1.6262 - val_accuracy: 0.1737
Epoch 3/15
25/25 [=====] - 188s 8s/step - loss: 1.6220 - accuracy: 0.2001 - val_loss: 1.6142 - val_accuracy: 0.2075
Epoch 4/15
25/25 [=====] - 188s 8s/step - loss: 1.6204 - accuracy: 0.1982 - val_loss: 1.6161 - val_accuracy: 0.2412
Epoch 5/15
25/25 [=====] - 189s 8s/step - loss: 1.5731 - accuracy: 0.2685 - val_loss: 1.5429 - val_accuracy: 0.3075
Epoch 6/15
25/25 [=====] - 189s 8s/step - loss: 1.4733 - accuracy: 0.3636 - val_loss: 1.5248 - val_accuracy: 0.3288
Epoch 7/15
25/25 [=====] - 189s 8s/step - loss: 1.3722 - accuracy: 0.4326 - val_loss: 1.5468 - val_accuracy: 0.3338
Epoch 8/15
25/25 [=====] - 190s 8s/step - loss: 1.2367 - accuracy: 0.5083 - val_loss: 1.6589 - val_accuracy: 0.3450
Epoch 9/15
25/25 [=====] - 189s 8s/step - loss: 1.0623 - accuracy: 0.5861 - val_loss: 1.6958 - val_accuracy: 0.3500
Epoch 10/15
25/25 [=====] - 188s 8s/step - loss: 0.7924 - accuracy: 0.7018 - val_loss: 2.0182 - val_accuracy: 0.3388
Epoch 11/15
25/25 [=====] - 189s 8s/step - loss: 0.4988 - accuracy: 0.8149 - val_loss: 2.6503 - val_accuracy: 0.3512
Epoch 12/15
25/25 [=====] - 189s 8s/step - loss: 0.2504 - accuracy: 0.9153 - val_loss: 3.3932 - val_accuracy: 0.3300
Epoch 13/15
25/25 [=====] - 190s 8s/step - loss: 0.1218 - accuracy: 0.9597 - val_loss: 3.9887 - val_accuracy: 0.3363
Epoch 14/15
25/25 [=====] - 191s 8s/step - loss: 0.0745 - accuracy: 0.9769 - val_loss: 4.2495 - val_accuracy: 0.3600
Epoch 15/15
25/25 [=====] - 189s 8s/step - loss: 0.0461 - accuracy: 0.9853 - val_loss: 5.6095 - val_accuracy: 0.3613

+ Code + Markdown

[13]: def plot_accuracy_loss(history):

Console

12:47 AM 11/3/2022 23

kaggle.com/code/sarahabo/atividade-2-cnn-classifica-o-de-imagens/edit

LIVE STREAMING

Atividade 2 - CNN Classificação de Image...

File Edit View Run Add-ons Help

Share Save Version 0

Draft Session (54m) H D C P U R A M

+ Run All Code

```
plt.plot(history.history['loss'], 'o--', label = 'loss')
plt.plot(history.history['val_loss'], 'ro--', label = "val_loss")
plt.title("train_loss vs val_loss")
plt.ylabel("loss")
plt.xlabel("epochs")
```

shuffle 2/2

plot_accuracy_loss(history)

train_acc vs val_acc

accuracy

train_loss vs val_loss

loss

epochs

+ Code + Markdown

test_loss = model.evaluate(test_images, test_labels)

Console

11:58 PM 11/2/2022

kaggle.com/code/sarahabo/atividade-2-cnn-classifica-o-de-imagens/edit

BEGINNER LEVELS - L... LIVE STREAMING

Atividade 2 - CNN Classificação de Image...

Draft saved

File Edit View Run Add-ons Help

Share Save Version 0

+ | | | Run All | Code ▾

plt.show()

Draft Session (1h:8m) H D C P U R A M

[17]: display_random_image(class_names, train_images, train_labels)

Image #1490 : Round

[18]:

```
def display_examples(class_names, images, labels):
    """
        Display 25 images from the images array with its corresponding labels
    """

    fig = plt.figure(figsize=(10,10))
```

Console

12:13 AM 11/3/2022

Atividade 2 - CNN Classificação de Image...

Draft saved

Share

Save Version 0

File Edit View Run Add-ons Help



Code ▾

Draft Session (1h:9m)



display_examples(class_names, train_images, train_labels)

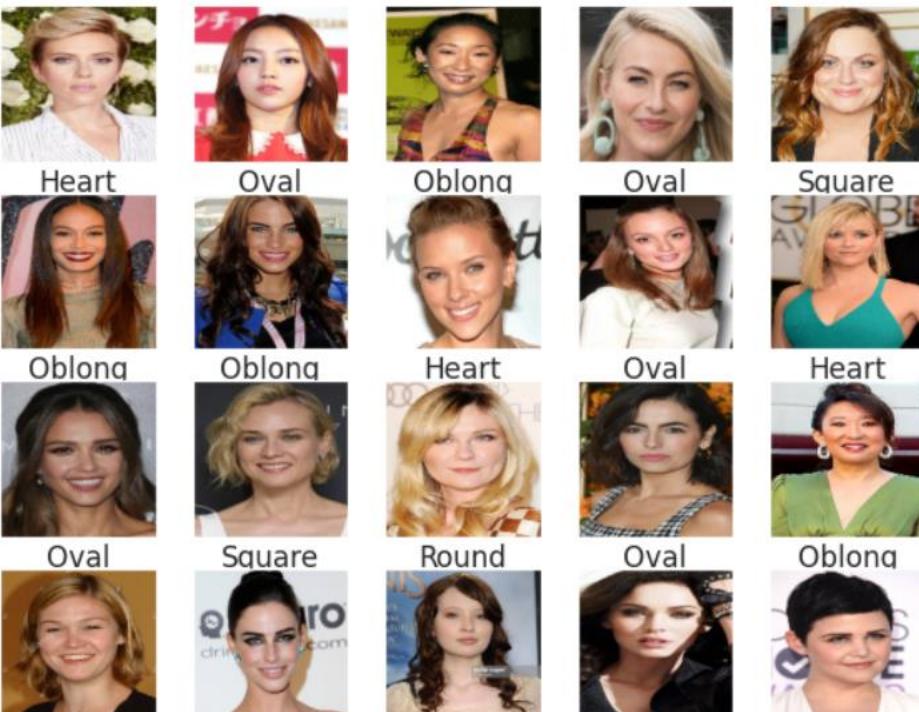
shuffle

A^a .*

2/2



Some examples of images of the dataset



Console

Atividade 2 - CNN Classificação de Image...

Draft saved

File Edit View Run Add-ons Help

Share Save Version 0 K

+ X D C R Run All Code ▾

predictions = model.predict(test_images) # vector of probabilities
pred_labels = np.argmax(predictions, axis = 1) # We take the highest probability

display_random_image(class_names, test_images, pred_labels)

shuffle A* 2/2

Image #110 : Round



```
def print_mislabeled_images(class_names, test_images, test_labels, pred_labels):  
    """  
        Print 25 examples of mislabeled images by the classifier, e.g when test_labels != pred_labels  
    """  
    B00 = (test_labels == pred_labels)  
    mislabeled_indices = np.where(B00 == 0)  
    mislabeled_images = test_images[mislabeled_indices]  
    mislabeled_labels = pred_labels[mislabeled_indices]
```

Console

2

Atividade 2 - CNN Classificação de Image...

Draft saved

File Edit View Run Add-ons Help



Code ▾

Draft Session (1h:9m)



```
print_mislabeled_images(class_names, test_images, test_labels, pred_labels)
```

shuffle Aa .*

2/2

^ v ... x

Some examples of images of the dataset



Console

kaggle.com/code/sarahabo/atividade-2-cnn-classifica-o-de-imagens/edit

BEGINNER LEVELS - L... LIVE STREAMING

Atividade 2 - CNN Classificação de Imagens

Draft saved

File Edit View Run Add-ons Help

Code ▾

Draft Session (1h:9m) H D C P U R A M

shuffle Aa .* 2/2

```
CM = confusion_matrix(test_labels, pred_labels)
ax = plt.axes()
sn.heatmap(CM, annot=True,
            annot_kws={"size": 10},
            xticklabels=class_names,
            yticklabels=class_names, ax = ax)
ax.set_title('Confusion matrix')
plt.show()
```

Confusion matrix

	Heart	Oblong	Oval	Round	Square
Heart	92	19	36	37	16
Oblong	67	47	39	28	19
Oval	59	16	67	37	21
Round	38	9	47	79	27
Square	37	15	35	47	66

+ Code + Markdown

Console

12:14 AM
11/3/2022

22

notebook4772754ce2

File Edit View Run Add-ons Help

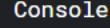


history - model.fit(train_images, train_labels, batch_size=120, epochs=10, validation_split=0.2) #20% of data is used for validation

```
2022-11-03 11:48:22.579424: I tensorflow/compiler/mlir/mlir_graph_optimization_pass.cc:185] None of the MLIR Optimization Passes are enabled (registered 2)
Epoch 1/15
25/25 [=====] - 167s 7s/step - loss: 2.7298 - accuracy: 0.1803 - val_loss: 1.6319 - val_accuracy: 0.1807
Epoch 2/15
25/25 [=====] - 163s 7s/step - loss: 1.6415 - accuracy: 0.1954 - val_loss: 1.6520 - val_accuracy: 0.1982
Epoch 3/15
25/25 [=====] - 163s 7s/step - loss: 1.6408 - accuracy: 0.1916 - val_loss: 1.6313 - val_accuracy: 0.1982
Epoch 4/15
25/25 [=====] - 162s 7s/step - loss: 1.6277 - accuracy: 0.2101 - val_loss: 1.6116 - val_accuracy: 0.1882
Epoch 5/15
25/25 [=====] - 164s 7s/step - loss: 1.6113 - accuracy: 0.2334 - val_loss: 1.5728 - val_accuracy: 0.2836
Epoch 6/15
25/25 [=====] - 162s 6s/step - loss: 1.4503 - accuracy: 0.3521 - val_loss: 1.3742 - val_accuracy: 0.4040
Epoch 7/15
25/25 [=====] - 160s 6s/step - loss: 1.2655 - accuracy: 0.4717 - val_loss: 1.2213 - val_accuracy: 0.4818
Epoch 8/15
25/25 [=====] - 159s 6s/step - loss: 1.1753 - accuracy: 0.5254 - val_loss: 1.1974 - val_accuracy: 0.4969
Epoch 9/15
25/25 [=====] - 158s 6s/step - loss: 1.1330 - accuracy: 0.5459 - val_loss: 1.2182 - val_accuracy: 0.4981
Epoch 10/15
25/25 [=====] - 156s 6s/step - loss: 1.0162 - accuracy: 0.5961 - val_loss: 1.0939 - val_accuracy: 0.5521
Epoch 11/15
25/25 [=====] - 158s 6s/step - loss: 0.8672 - accuracy: 0.6614 - val_loss: 1.0545 - val_accuracy: 0.5734
Epoch 12/15
25/25 [=====] - 157s 6s/step - loss: 0.7155 - accuracy: 0.7334 - val_loss: 1.1089 - val_accuracy: 0.5997
Epoch 13/15
25/25 [=====] - 160s 6s/step - loss: 0.5397 - accuracy: 0.8031 - val_loss: 1.1754 - val_accuracy: 0.5972
Epoch 14/15
25/25 [=====] - 159s 6s/step - loss: 0.3934 - accuracy: 0.8549 - val_loss: 1.3110 - val_accuracy: 0.6085
Epoch 15/15
25/25 [=====] - 158s 6s/step - loss: 0.2376 - accuracy: 0.9165 - val_loss: 1.4886 - val_accuracy: 0.6211
```

+ Code

+ Markdown



Console



2:29 PM

11/3/2022

24

notebook4772754ce2

File Edit View Run Add-ons Help

Share

Save Version 0

K

+ | - | X | 📄 | 📁 | ▶ | ▷ | Run All |

Code ▾

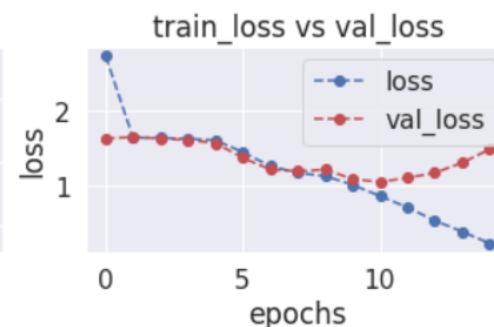
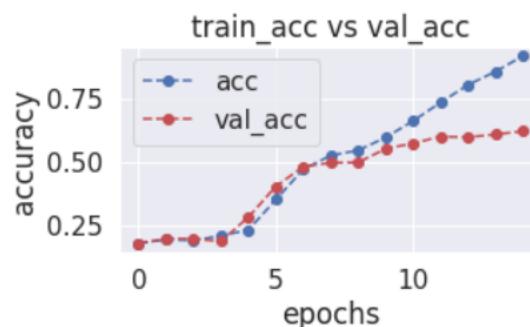
Draft Session (43m)

HDD CPU RAM

Power Refresh

More

▶ plot_accuracy_loss(history)



+ Code + Markdown

[]: test_loss = model.evaluate(test_images, test_labels)

[]: def display_random_image(class_names, images, labels):
 """
 Display a random image from the images array and its corresponding label from the labels array
 """

Console

notebook4772754ce2 Draft saved

File Edit View Run Add-ons Help

Share

Save Version 0

K

+ Run All

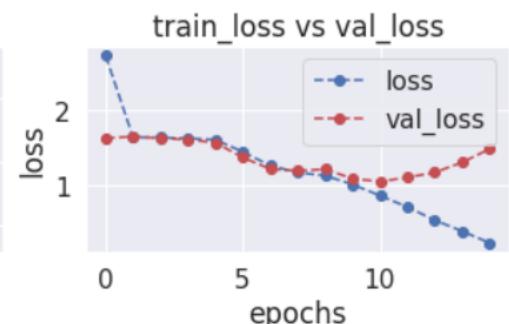
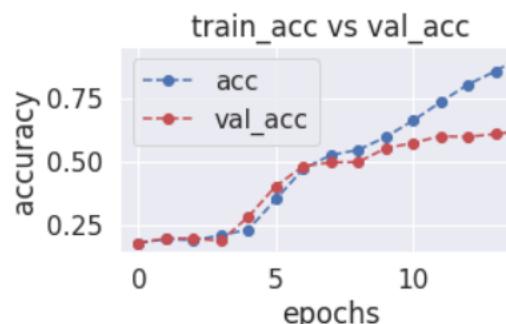
Code ▾

Draft Session (43m)

H
DC
P
UR
A
M

⋮

[14]: plot_accuracy_loss(history)



▶ test_loss = model.evaluate(test_images, test_labels)

32/32 [=====] - 11s 333ms/step - loss: 1.7018 - accuracy: 0.5892

+ Code

+ Markdown

[]: def display_random_image(class_names, images, labels):
 """
 Display a random image from the images array and its correspond label from the labels array.
 """

Console 1

notebook4772754ce2

File Edit View Run Add-ons Help

Share

Save Version 0

K

+ | | | | | | Run All

Code ▾

Draft Session (44m)

HDD CPU RAM

Power Refresh More

```
plt.yticks([])
plt.grid(False)
plt.title('Image #{:} : {}'.format(index) + class_names[labels[index]])
plt.show()
```

display_random_image(class_names, train_images, train_labels)



+ Code + Markdown

[]:

```
def display_random_image(class_names, images, labels):
```

1

Console

notebook4772754ce2 Draft saved

File Edit View Run Add-ons Help

Share

Save Version 0

K

+ Run All

Code ▾

Draft Session (44m)

H
D
DC
P
UR
A
M

⋮

Some examples of images of the dataset



Square



Oval



Oblong



Square



Oblong



Heart



Round



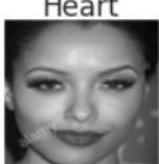
Oval



Oval



Square



Heart



Oval



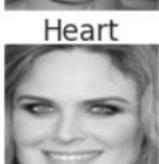
Oblong



Round



Round



Square



Oval



Oval



Round



Oval

1

Console

notebook4772754ce2 Draft saved

File Edit View Run Add-ons Help

Share

Save Version 0

K

+ 🗑️ 🕒 📁

Code ▾

Draft Session (45m) H D C P U R A M 🔍 ⌂

```
▶ predictions = model.predict(test_images)      # Vector of probabilities
pred_labels = np.argmax(predictions, axis = 1) # We take the highest probability

display_random_image(class_names, test_images, pred_labels)
```

Image #437 : Square



+ Code + Markdown

```
[ ]: def print_mislabeled_images(class_names, test_images, test_labels, pred_labels):
    """
        Print 25 examples of mislabeled images by the classifier, e.g when test_labels != pred_labels
    """
```



Console



notebook4772754ce2

File Edit View Run Add-ons Help

Share

Save Version

0

K

+ Run All

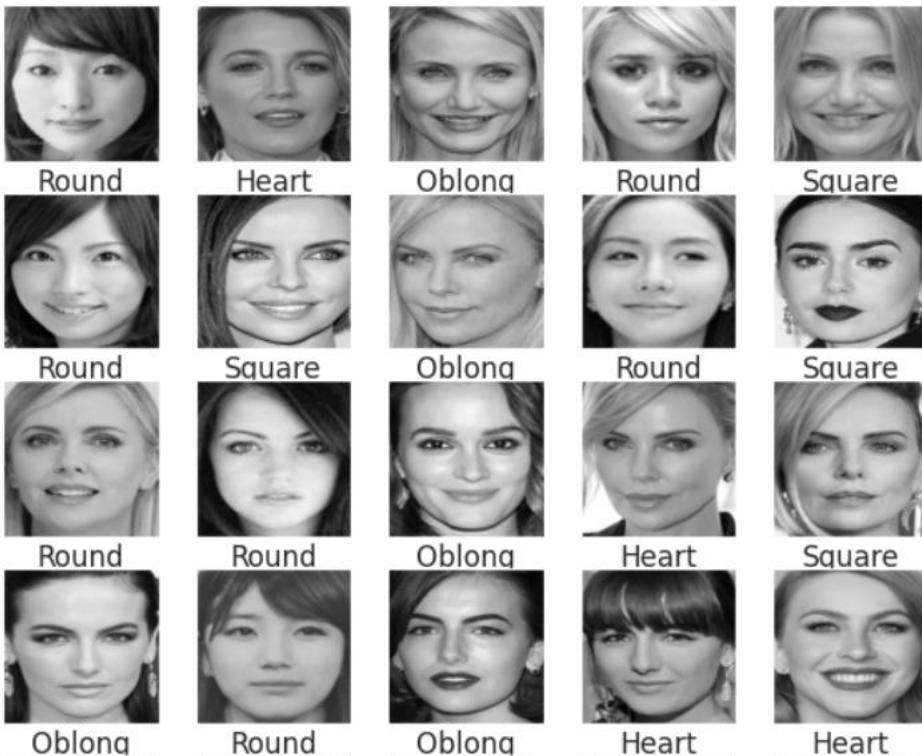
Code ▾

Draft Session (45m)

H
D
DC
P
UR
A
M

⋮

Some examples of images of the dataset



1

Console

notebook4772754ce2

File Edit View Run Add-ons Help

Share

Save Version 0

K

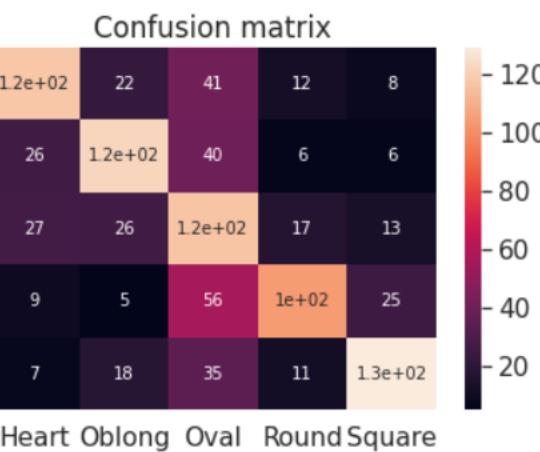
+ Run All

Code

Draft Session (45m)

HDD C PU RAM

```
CM = confusion_matrix(test_labels, pred_labels)
ax = plt.axes()
sn.heatmap(CM, annot=True,
            annot_kws={"size": 10},
            xticklabels=class_names,
            yticklabels=class_names, ax = ax)
ax.set_title('Confusion matrix')
plt.show()
```



+ Code

+ Markdown

1

Console



<https://www.kaggle.com/code/zeyadkhalid/face-shape-recognition-73-accuracy>

- 50 epoch
- Time (1.6 hours)
- Dataset([face shape processed](#))
- Accuracy :73%

Face Shape Recognition Draft saved

File Edit View Run Add-ons Help

Share

Save Version

0

K

+ Code

Draft Session (2h:10m)

```
Epoch 14/50  
63/63 [=====] - 195s 3s/step - loss: 0.7586 - accuracy: 0.7062 - val_loss: 1.0295 - val_accuracy: 0.6403  
Epoch 15/50  
63/63 [=====] - 194s 3s/step - loss: 0.6694 - accuracy: 0.7588 - val_loss: 0.9807 - val_accuracy: 0.6403  
Epoch 16/50  
63/63 [=====] - 195s 3s/step - loss: 0.5948 - accuracy: 0.7740 - val_loss: 0.9541 - val_accuracy: 0.6453  
Epoch 17/50  
63/63 [=====] - 195s 3s/step - loss: 0.5231 - accuracy: 0.8196 - val_loss: 0.9693 - val_accuracy: 0.6533  
Epoch 18/50  
63/63 [=====] - 197s 3s/step - loss: 0.4602 - accuracy: 0.8303 - val_loss: 0.8979 - val_accuracy: 0.6653  
Epoch 19/50  
63/63 [=====] - 194s 3s/step - loss: 0.4279 - accuracy: 0.8443 - val_loss: 0.9125 - val_accuracy: 0.6713  
Epoch 20/50  
63/63 [=====] - 196s 3s/step - loss: 0.3978 - accuracy: 0.8629 - val_loss: 1.0959 - val_accuracy: 0.6443  
Epoch 21/50  
63/63 [=====] - 196s 3s/step - loss: 0.3509 - accuracy: 0.8758 - val_loss: 0.9637 - val_accuracy: 0.6914  
Epoch 22/50  
63/63 [=====] - 197s 3s/step - loss: 0.2403 - accuracy: 0.9151 - val_loss: 1.0979 - val_accuracy: 0.6633  
Epoch 23/50  
63/63 [=====] - 195s 3s/step - loss: 0.2535 - accuracy: 0.9062 - val_loss: 0.9747 - val_accuracy: 0.7134  
Epoch 24/50  
63/63 [=====] - 196s 3s/step - loss: 0.1721 - accuracy: 0.9428 - val_loss: 0.9940 - val_accuracy: 0.7124  
Epoch 25/50  
63/63 [=====] - 195s 3s/step - loss: 0.1661 - accuracy: 0.9450 - val_loss: 1.0301 - val_accuracy: 0.7174  
Epoch 26/50  
63/63 [=====] - 195s 3s/step - loss: 0.1125 - accuracy: 0.9730 - val_loss: 1.0815 - val_accuracy: 0.7154  
Epoch 27/50  
63/63 [=====] - 195s 3s/step - loss: 0.1244 - accuracy: 0.9620 - val_loss: 1.2538 - val_accuracy: 0.6894  
Epoch 28/50  
63/63 [=====] - 196s 3s/step - loss: 0.1134 - accuracy: 0.9612 - val_loss: 1.0907 - val_accuracy: 0.7154  
Epoch 29/50  
63/63 [=====] - 195s 3s/step - loss: 0.1087 - accuracy: 0.9656 - val_loss: 1.1064 - val_accuracy: 0.7174  
Epoch 30/50  
63/63 [=====] - 195s 3s/step - loss: 0.0916 - accuracy: 0.9706 - val_loss: 1.1978 - val_accuracy: 0.7144  
Epoch 31/50  
63/63 [=====] - 194s 3s/step - loss: 0.0715 - accuracy: 0.9769 - val_loss: 1.2006 - val_accuracy: 0.7305
```

+ Code

+ Markdown

Console



Face Shape Recognition | Kaggle × kaggle_processed - Google Drive × +

kaggle.com/code/sarahabo/face-shape-recognition/edit

Beginner Levels - L... LIVE STREAMING

Face Shape Recognition Draft saved

File Edit View Run Add-ons Help

Share Save Version 0

Code

Epoch 30/50
63/63 [=====] - 194s 3s/step - loss: 0.0715 - accuracy: 0.9769 - val_loss: 1.2006 - val_accuracy: 0.7

model

Draft Session (2h:10m) H D C P U R A M

+ Code + Markdown

[12]:
Evaluate Model
scoreSeg = model.evaluate_generator(test_set)
print("Accuracy = ", scoreSeg[1])

Accuracy = 0.7304609417915344

[13]:
model.save("face-shape-recognizer.h5")

[14]:
Visualize Loss & Accuracy

%matplotlib inline
acc = history.history['accuracy']
val_acc = history.history['val_accuracy']
loss = history.history['loss']
val_loss = history.history['val_loss']

epochs = range(len(acc))

Console

4:53 PM 11/3/2022 25

Face Shape Recognition | Kaggle × kaggle_processed - Google Drive × +

kaggle.com/code/sarahabo/face-shape-recognition/edit

Beginner Levels - L... LIVE STREAMING

Face Shape Recognition

Draft saved

File Edit View Run Add-ons Help

Code ▾

+

Training and validation accuracy

Epoch	Training accuracy	Validation accuracy
0	0.25	0.25
5	0.55	0.50
10	0.68	0.58
15	0.82	0.65
20	0.90	0.70
25	0.95	0.72
30	0.98	0.75

Training and validation loss

Epoch	Training Loss	Validation Loss
0	4.5	1.5
5	1.0	1.3
10	0.8	1.1
15	0.6	1.0
20	0.3	1.1
25	0.1	1.2
30	0.05	1.2

Share

Save Version 0

Draft Session (2h:10m)

model A^a * 4/28

Console

4:53 PM 11/3/2022

25

Face Shape Recognition | Kaggle × kaggle_processed - Google Drive × +

kaggle.com/code/sarahabo/face-shape-recognition/edit

Beginner Levels - L... LIVE STREAMING

Face Shape Recognition Draft saved

File Edit View Run Add-ons Help

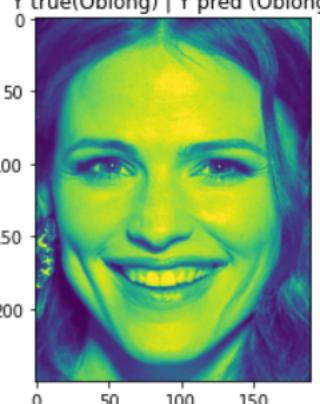
Share Save Version 0

+ | X | 📁 | 🗂️ | ⏪ | ⏹ | Run All | Code ▾

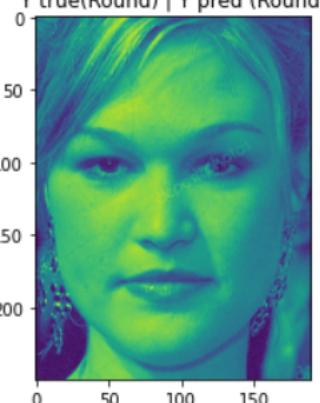
Draft Session (2h:10m) H D C P U R A M

model A* 4/28

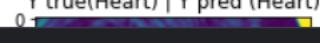
Y true(Oblong) | Y pred (Oblong)



Y true(Round) | Y pred (Round)



Y true(Heart) | Y pred (Heart)



Console

4:53 PM 11/3/2022 25