

```
1 !wget http://vis-www.cs.umass.edu/lfw/lfw.tgz
2 !tar -xvf /content/lfw.tgz
3 import tensorflow as tf
4 from sklearn.datasets import load_sample_image
5 import os
6 import tensorflow.keras.applications.resnet50 as resnet50
7 from tensorflow.keras.applications.resnet50 import ResNet50, preprocess_
8 from tensorflow.keras.preprocessing.image import load_img, img_to_array
9 import numpy as np
10 from PIL import Image
11 from sklearn.neighbors import NearestNeighbors
```

```
8 /content/lfw/Junichiro_Koizumi/Junichiro_Koizumi_0005.jpg
9 /content/lfw/Junichiro_Koizumi/Junichiro_Koizumi_0018.jpg
10 /content/lfw/Daniel_Kurtzer/Daniel_Kurtzer_0001.jpg
Similar images for /content/lfw/Bob_Hayes/Bob_Hayes_0001.jpg
1 /content/lfw/Bob_Hayes/Bob_Hayes_0001.jpg
2 /content/lfw/Sue_Guevara/Sue_Guevara_0001.jpg
3 /content/lfw/Calista_Flockhart/Calista_Flockhart_0005.jpg
4 /content/lfw/Carol_Niedermayer/Carol_Niedermayer_0001.jpg
5 /content/lfw/Calista_Flockhart/Calista_Flockhart_0002.jpg
6 /content/lfw/Junichiro_Koizumi/Junichiro_Koizumi_0022.jpg
7 /content/lfw/Junichiro_Koizumi/Junichiro_Koizumi_0006.jpg
8 /content/lfw/Jude_Law/Jude_Law_0001.jpg
9 /content/lfw/Calista_Flockhart/Calista_Flockhart_0001.jpg
10 /content/lfw/Jenna_Elfman/Jenna_Elfman_0001.jpg
```

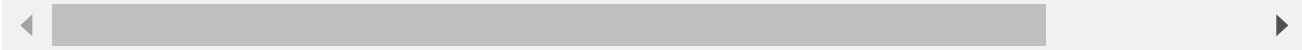
```
1 directory = '/content/lfw'
2 model = resnet50.ResNet50(weights='imagenet', include_top=False, pooling:
3 feature_dict = {}
4 image_files = []
5 target_size = (224, 224)
6 i = 0
7
8 # Sample at most 2000 images because the whole entire dataset
9 # costs too much cpu power and ram
10
11 def preprocess_image(image_path, target_size):
12     img = load_img(os.path.join(directory, image_path), target_size=target_
13     x = img_to_array(img)
14     x = tf.expand_dims(x, axis = 0)
15     x = preprocess_input(x)
16     features = model.predict(x)
17     return features
18
19 for dir in os.listdir(directory):
20     i += 1
21     new_dir = '/content/lfw/'+dir
22     if os.path.isdir(new_dir):
23         for files in os.listdir(new_dir):
24             feature_dict[dir] = preprocess_image(new_dir+'/'+files, targ
25     if i >= 100:
26         break
```

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```

```
1 for file, features in feature_dict.items():
2     print(file, features)
3
4 feature_map = np.array(list(feature_dict.values()))
5
```

```
6 NearNeigh = NearestNeighbors(n_neighbors=10,algorithm='auto').fit(feature
7
8 for image_path in feature_dict:
9     img = feature_dict[image_path].reshape(1,-1)
10    distance,indices = NearNeigh.kneighbors(img)
11    print('Similar images for', image_path)
12    for i, index in enumerate(indices[0]):
13        similar_img_path = list(feature_dict.keys())[index]
14        print(i+1,similar_img_path)
```

```
10 Kathryn_Grayson
Similar images for Bob_Hayes
1 Bob_Hayes
2 Sue_Guevara
3 Carol_Niedermayer
4 Calista_Flockhart
5 Jude_Law
6 Jenna_Elfman
7 Philip_Zalewski
8 Ben_Lee
```



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