Ifactory_good_vs_bad_final

September 20, 2019

```
In [1]: import cv2                  # working with, mainly resizing, images
        import numpy as np          # dealing with arrays
        import os                   # dealing with directories
        from random import shuffle # mixing up or currently ordered data that might lead our n
        from tqdm import tqdm      # a nice pretty percentage bar for tasks. Thanks to viewer
```

```
In [2]: !pip install tqdm
```

```
Requirement already satisfied: tqdm in c:\users\mahmo\anaconda3\lib\site-packages (4.19.5)


WARNING: You are using pip version 19.1, however version 19.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
```

```
In [14]: #TRAIN_DIR = 'train_n'
         GOOD_DIR = 'dataset/good'
         BAD_DIR = 'dataset/bad'
         TEST_DIR = 'dataset/final_test'
         IMG_SIZE = 512
         LR = 0.001
```

```
In [15]: MODEL_NAME = 'Ifact-{}-{}.model'.format(LR, '2conv-basic') # just so we remember whic
```

```
In [16]: def create_train_data():
             training_data = []

             for img in tqdm(os.listdir(GOOD_DIR)):
                 label = [1.0,0.0] # 'good'
                 path = os.path.join(GOOD_DIR,img)
                 img = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
                 img = cv2.resize(img, (IMG_SIZE,IMG_SIZE))/255
                 training_data.append([np.array(img),np.array(label)])

             for img in tqdm(os.listdir(BAD_DIR)):
                 label = [0.0,1.0] #'bad'
                 path = os.path.join(BAD_DIR,img)
                 img = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
                 img = cv2.resize(img, (IMG_SIZE,IMG_SIZE))/255
                 training_data.append([np.array(img),np.array(label)])

             shuffle(training_data)
             np.save('train_data.npy', training_data)

             return training_data

In [17]: def process_test_data():
             testing_data = []
             cnt = 0
             for img in tqdm(os.listdir(TEST_DIR)):
                 path = os.path.join(TEST_DIR,img)
                 img_num = img.split('.')[0]
                 print(img_num)
                 img = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
                 img = cv2.resize(img, (IMG_SIZE,IMG_SIZE))
                 testing_data.append([np.array(img), img_num])
                 cnt += 1

             shuffle(testing_data)
             np.save('test_data.npy', testing_data)

In [18]: train_data = create_train_data()
         test_data = process_test_data()
         # If you have already created the dataset:
         #train_data = np.load('train_data.npy')
```

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100%|| 55/55 [00:00<00:00, 294.86it/s]
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 90%|                    | 269/300 [00:01<00:00, 216.12it/s]
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 97%|     | 292/300 [00:01<00:00, 216.88it/s]
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100%|| 300/300 [00:01<00:00, 216.87it/s]
```

```
In [19]: !pip install tflearn
```

```
Requirement already satisfied: tflearn in c:\users\mahmo\anaconda3\lib\site-packages (0.3.2)
Requirement already satisfied: six in c:\users\mahmo\anaconda3\lib\site-packages (from tflearn)
Requirement already satisfied: Pillow in c:\users\mahmo\anaconda3\lib\site-packages (from tflea
Requirement already satisfied: numpy in c:\users\mahmo\appdata\roaming\python\python36\site-pac


WARNING: You are using pip version 19.1, however version 19.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
```

```
In [20]: !pip install tensorflow_cpu
```

```
Collecting tensorflow_cpu


  ERROR: Could not find a version that satisfies the requirement tensorflow_cpu (from versions
ERROR: No matching distribution found for tensorflow_cpu
WARNING: You are using pip version 19.1, however version 19.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
```

```
In [21]: !pip install --upgrade tflearn
```

```
Requirement already up-to-date: tflearn in c:\users\mahmo\anaconda3\lib\site-packages (0.3.2)
Requirement already satisfied, skipping upgrade: six in c:\users\mahmo\anaconda3\lib\site-packa
Requirement already satisfied, skipping upgrade: numpy in c:\users\mahmo\appdata\roaming\pythor
Requirement already satisfied, skipping upgrade: Pillow in c:\users\mahmo\anaconda3\lib\site-pa


WARNING: You are using pip version 19.1, however version 19.1.1 is available.
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```

```
In [22]: krl = 3
         drp_out_per = 0.2
         epoc_n = 7
         bsize = 20
```

```
In [25]: import tensorflow as tf

         import tflearn
         from tflearn.layers.conv import conv_2d, max_pool_2d
         from tflearn.layers.core import input_data, dropout, fully_connected
         from tflearn.layers.estimator import regression

         tf.reset_default_graph()

         convnet = input_data(shape=[None, IMG_SIZE, IMG_SIZE, 1], name='input')
         convnet = conv_2d(convnet, 32, krl, activation='relu')
         convnet = max_pool_2d(convnet, krl)
         #convnet = dropout(convnet, drp_out_per)

         convnet = conv_2d(convnet, 64, krl, activation='relu')
         convnet = max_pool_2d(convnet, krl)
         #convnet = dropout(convnet, drp_out_per)

         convnet = conv_2d(convnet, 128, krl, activation='relu')
         convnet = max_pool_2d(convnet, krl)
         #convnet = dropout(convnet, drp_out_per)

         convnet = conv_2d(convnet, 256, krl, activation='relu')
         convnet = max_pool_2d(convnet, krl)
         #convnet = dropout(convnet, drp_out_per)

         convnet = conv_2d(convnet, 512, krl, activation='relu')
         convnet = max_pool_2d(convnet, krl)
         #convnet = dropout(convnet, drp_out_per)

         convnet = fully_connected(convnet, 1024, activation='relu')
         convnet = dropout(convnet, drp_out_per)

         convnet = fully_connected(convnet, 2, activation='softmax')
         convnet = regression(convnet, optimizer='adam', learning_rate=LR, loss='categorical_c

         model = tflearn.DNN(convnet, tensorboard_dir='log')
```

```
curses is not supported on this machine (please install/reinstall curses for an optimal experie
```

```
In [24]: !pip install tflearn
```

```
Requirement already satisfied: tflearn in c:\users\mahmo\anaconda3\lib\site-packages (0.3.2)
Requirement already satisfied: Pillow in c:\users\mahmo\anaconda3\lib\site-packages (from tflea
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Requirement already satisfied: six in c:\users\mahmo\anaconda3\lib\site-packages (from tflearn


WARNING: You are using pip version 19.1, however version 19.1.1 is available.
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```

```
In [26]: if os.path.exists('{}.meta'.format(MODEL_NAME)):
             model.load(MODEL_NAME)
             print('model loaded!')
```

```
In [27]: train = train_data[:-30]
         test = train_data[-30:]
         X = np.array([i[0] for i in train]).reshape(-1,IMG_SIZE,IMG_SIZE,1)
         Y = [i[1] for i in train]

         test_x = np.array([i[0] for i in test]).reshape(-1,IMG_SIZE,IMG_SIZE,1)
         test_y = [i[1] for i in test]
```

```
In [28]: model.fit({'input': X}, {'targets': Y}, n_epoch=epoc_n, batch_size=bsize ,
                    validation_set=({'input': test_x}, {'targets': test_y}),
                    snapshot_step=500, show_metric=True, run_id=MODEL_NAME)
```

```
Training Step: 34  | total loss: 0.69253 | time: 11.346s
| Adam | epoch: 007 | loss: 0.69253 - acc: 0.5324 -- iter: 80/91
Training Step: 35  | total loss: 0.68691 | time: 14.389s
| Adam | epoch: 007 | loss: 0.68691 - acc: 0.5675 | val_loss: 0.71188 - val_acc: 0.4000 -- ite
--
```

```
In [29]: model.predict(test_x)
```

```
Out[29]: array([[0.5432391 , 0.45676085],
                [0.54299414, 0.45700592],
                [0.54130334, 0.45869666],
                [0.54111207, 0.45888793],
                [0.54257685, 0.4574231 ],
                [0.5400276 , 0.45997232],
                [0.5441604 , 0.45583966],
                [0.5436983 , 0.4563017 ],
                [0.54349273, 0.45650724],
                [0.5442844 , 0.45571557],
                [0.5432509 , 0.45674908],
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                [0.5413831 , 0.4586169 ],
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                [0.54534686, 0.45465317],
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                [0.54463756, 0.45536244],
                [0.543896  , 0.45610398],
                [0.54633313, 0.45366684],
                [0.5421926 , 0.4578074 ],
                [0.54133576, 0.45866424],
                [0.5400458 , 0.45995417],
                [0.54458714, 0.45541286],
                [0.5459029 , 0.45409715]], dtype=float32)
```

```
In [30]: print(test_x[2][1])
```

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[[0.74509804]
 [0.70980392]
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```
In [18]: from PIL import Image
```

```
In [31]: def process_test_data():
             testing_data = []
             for img in tqdm(os.listdir(TEST_DIR)):
                 path = os.path.join(TEST_DIR,img)
                 img_num = img.split('.')[0]
                 img = cv2.imread(path,cv2.IMREAD_GRAYSCALE)
                 img = cv2.resize(img, (IMG_SIZE,IMG_SIZE))
```

```
                testing_data.append([np.array(img), img_num])

            shuffle(testing_data)
            np.save('test_data.npy', testing_data)
```

```
In [32]: prediction = model.predict(test_x)
         for i in range(len(test_x)):
             print(prediction[i][1])
```

```
0.45676085
0.45700592
0.45869666
0.45888793
0.4574231
0.45997232
0.45583966
0.4563017
0.45650724
0.45571557
0.45674908
0.45624098
0.4586169
0.4573857
0.45213836
0.45465317
0.45507488
0.4554544
0.45748955
0.45699805
0.45732427
0.454597
0.45536244
0.45610398
0.45366684
0.4578074
0.45866424
0.45995417
0.45541286
0.45409715
```

===== TESTING THE MODEL ===== TESTING THE MODEL ===== TESTING THE MODEL ===== TESTING THE MODEL =====

```
In [33]: X_DIR = 'X'
         import numpy as np
         from PIL import Image
         import matplotlib.pyplot as plt
         %matplotlib inline
         def create_X_data(var):
             training_data = []
             label = [0.0,1.0] #'bad'
             img = cv2.imread(var,cv2.IMREAD_GRAYSCALE)
             img = cv2.resize(img, (IMG_SIZE,IMG_SIZE))/255
             training_data.append([np.array(img),np.array(label)])

             shuffle(training_data)
             np.save('train_data.npy', training_data)


             #im = image_path = cv2.imread('dataset\\good\\IMG_9002.JPG') #np.array(Image.open


             return training_data
```

0.1 Testing part of the code

```
In [35]: pic = 'D:\\_ashraf\\igood300\\IMG_9001.JPG'
         X_data = create_X_data(pic)
         print(len(X_data))
         X_1 = []
         X_1 = np.array([i[0] for i in X_data]).reshape(-1,IMG_SIZE,IMG_SIZE,1)
         Y = [i[1] for i in X_data]

         #print(yhat)
```

```
1
```

0.2 Reading image from webcamera

```
In [ ]: import cv2
        if cap:
            cap.release()

        cap=cv2.VideoCapture(0)
        if cap.isOpened():
            ret, frame=cap.read()
          # print(ret)
          # print(frame)
        else:
            ret=False
        imge1=cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
        plt.imshow(imge1)
        plt.title("color image ")
        plt.xticks([])
        plt.yticks([])
        plt.show()

        # save image
        status = cv2.imwrite('testImage.png',imge1)

        #print("Image written to file-system : ",status)
        cap.release()
        #del(cap)
```

```
In [72]: #cam.release()
```

```
In [38]: proba = model.predict(X_1)
         #print(proba)
         #print( proba.argmax(axis=-1))
         idxs = np.argsort(proba)[::-1][:2]
         #print(idxs)
         y = ""
         if idxs[0][1]==1:
             y="This is a Bad Product"
         else:
             y="This is a Good Product"

         image_path = cv2.imread(pic)
         #cv2.imshow('image',image_path)
         #cv2.waitKey(0)
         #cv2.destroyAllWindows()



         #im = image_path = cv2.imread('dataset\\good\\IMG_9002.JPG') #np.array(Image.open(ima

         plt.imshow(image_path)
         plt.title(y.upper())
         plt.show()


         # Sending SMS to a phone number

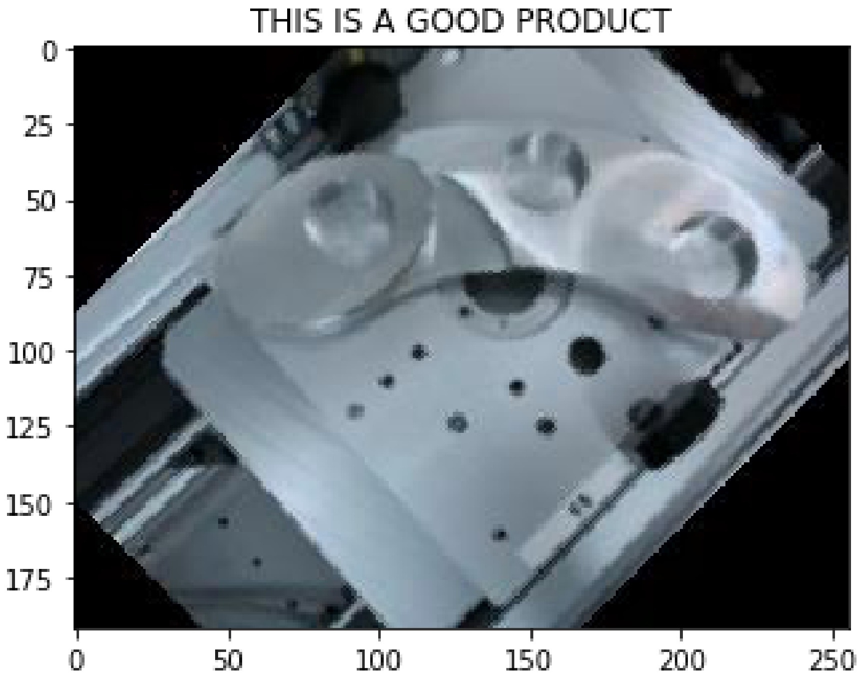
         import time
         from sinchsms import SinchSMS

         number = '+15193001412'
         #message = message1.upper()
         message = y


         client = SinchSMS('ce00e956-0ec9-47f7-9000-e68a6926a964', 'mN1Udit8NkeRdcpHSOb3mQ==')
```

```
print("Sending '%s' to %s" % (message, number))
response = client.send_message(number, message)
message_id = response['messageId']

response = client.check_status(message_id)
while response['status'] != 'Successful':
    print(response['status'])
    time.sleep(1)
    response = client.check_status(message_id)
    print(response['status'])
```



```
Sending 'This is a Good Product' to +15193001412
```

```
In [37]: !pip install sinchsms
```

```
Collecting sinchsms
  Using cached https://files.pythonhosted.org/packages/36/4c/47099a633d0ec855344962871b85b1f40
Building wheels for collected packages: sinchsms
  Building wheel for sinchsms (setup.py): started
  Building wheel for sinchsms (setup.py): finished with status 'done'
  Stored in directory: C:\Users\mahmo\AppData\Local\pip\Cache\wheels\f2\ab\b2\2fc205820f124ae0
Successfully built sinchsms
Installing collected packages: sinchsms
Successfully installed sinchsms-1.0.4
```

```
WARNING: You are using pip version 19.1, however version 19.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
```

```
In [ ]: import time
        from sinchsms import SinchSMS

        number = '+15193001412'
        #message = message1.upper()
        message = y


        client = SinchSMS('ce00e956-0ec9-47f7-9000-e68a6926a964', 'mN1Udit8NkeRdcpHSOb3mQ==')

        print("Sending '%s' to %s" % (message, number))
        response = client.send_message(number, message)
        message_id = response['messageId']

        response = client.check_status(message_id)
        while response['status'] != 'Successful':
            print(response['status'])
            time.sleep(1)
            response = client.check_status(message_id)
            print(response['status'])
```