Assignment 6.3

July 9, 2021

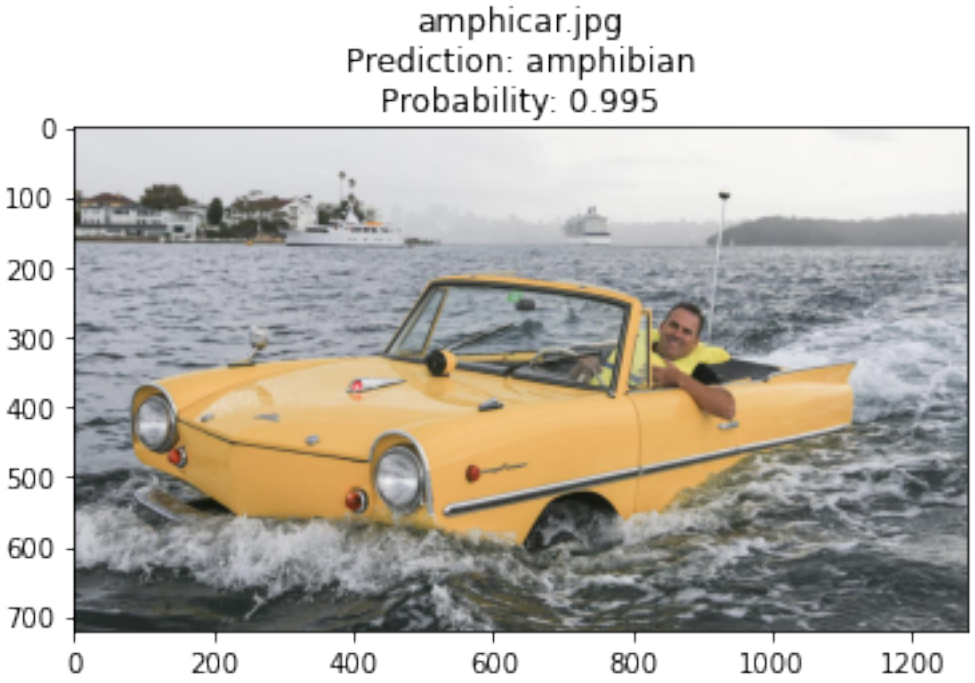
1 Assignment 6.3

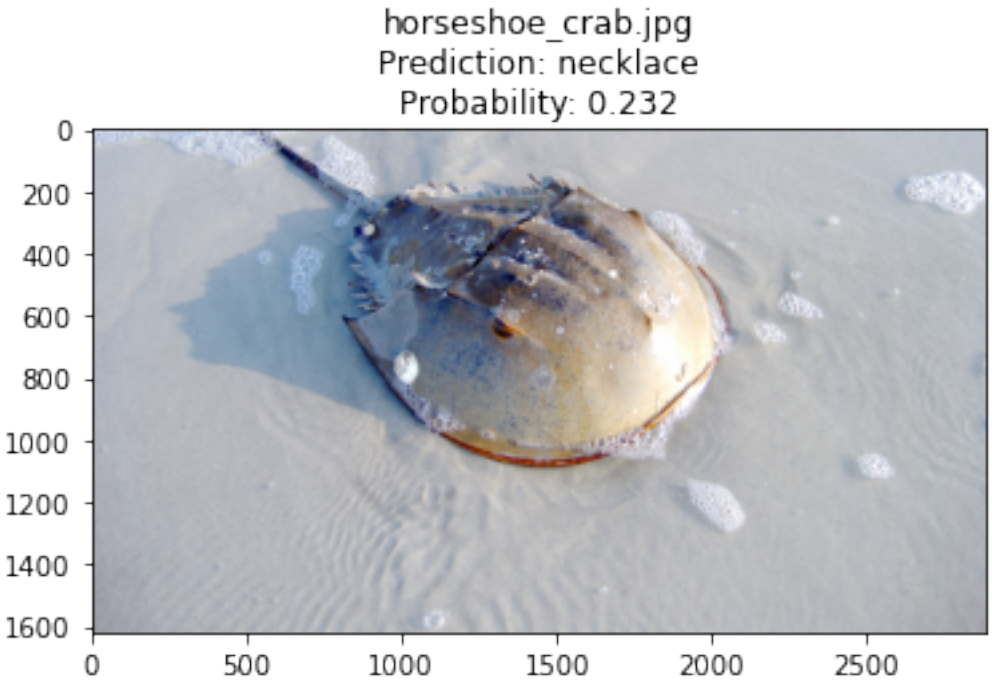
Load the ResNet50 model. Perform image classification on five to ten images of your choice. They can be personal images or publically available images. Include the images in `dsc650/assignments/assignment06/images/`. Save the predictions `dsc650/assignments/assignment06/results/predictions/resnet50 directory`. If you are using JupyterHub, you can include those plots in your Jupyter notebook.

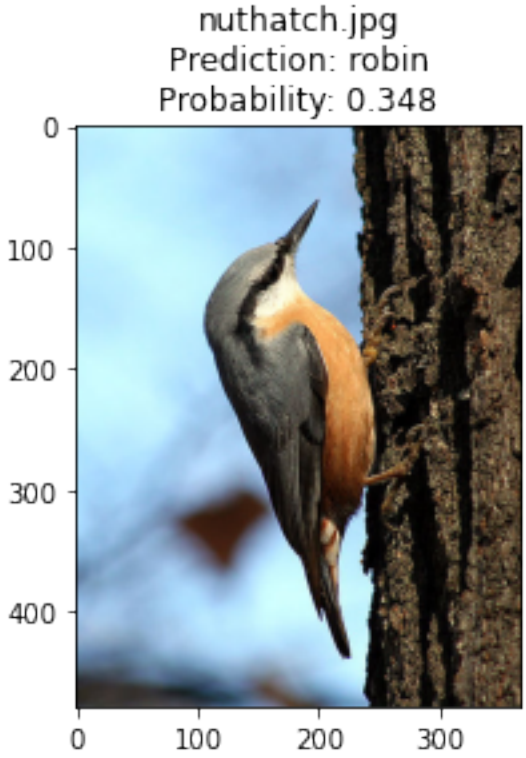
[1]:
```
from tensorflow.keras.applications.resnet50 import ResNet50, preprocess_input,␣
↪decode_predictions
from tensorflow.keras.preprocessing import image
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.image as mpimg

from pathlib import Path
import os

model = ResNet50(weights='imagenet')

def process_image(img_path):
    img = image.load_img(img_path, target_size=(224, 224))
    img = image.img_to_array(img)
    img = np.expand_dims(img, axis=0)
    img = preprocess_input(img)
    return(img)

def predict_image(processed_img):
    preds = model.predict(processed_img)
    prediction = decode_predictions(preds, top=1)[0][0]
    _, description, probability = prediction
    return description, probability
```

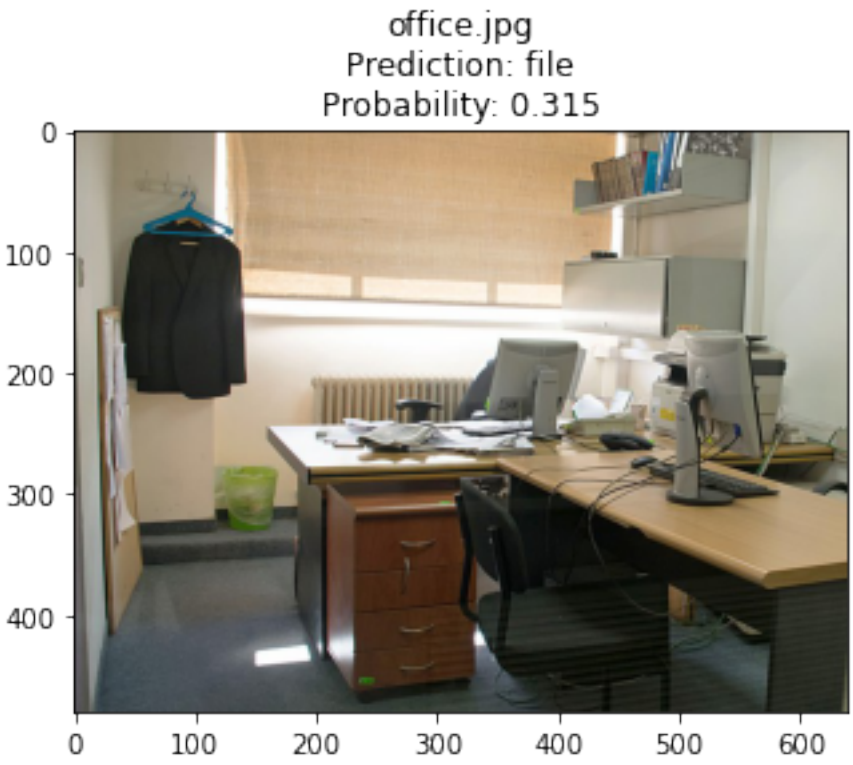
[2]:
```
import os
import pandas as pd
from IPython.display import Image

current_dir = Path(os.getcwd()).absolute()
```

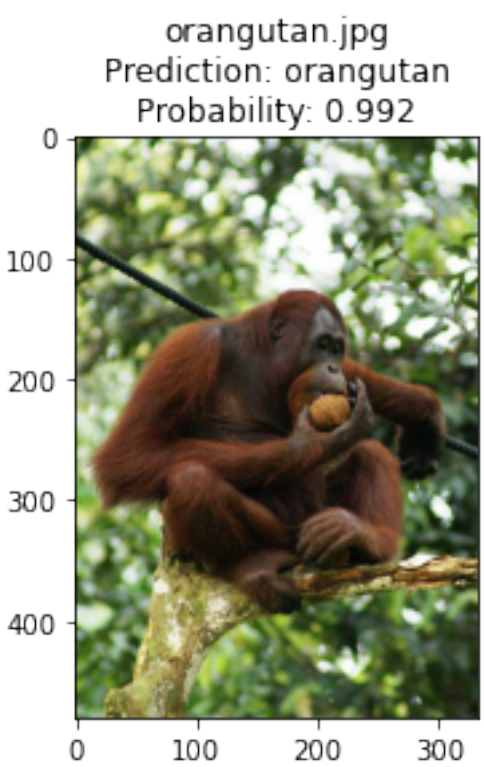
```
images_dir = current_dir.joinpath('images')

for root, dirs, pictures in os.walk(images_dir):
    for picture in pictures:
        image_path = Path(root).joinpath(picture)
        img = process_image(image_path)
        description, probability = predict_image(img)
        pic = mpimg.imread(image_path)
        plt.imshow(pic)
        plt.title(f'{picture}\nPrediction: {description:^}\nProbability:␣
 ↪{probability:.3f}')
        plt.show()
```



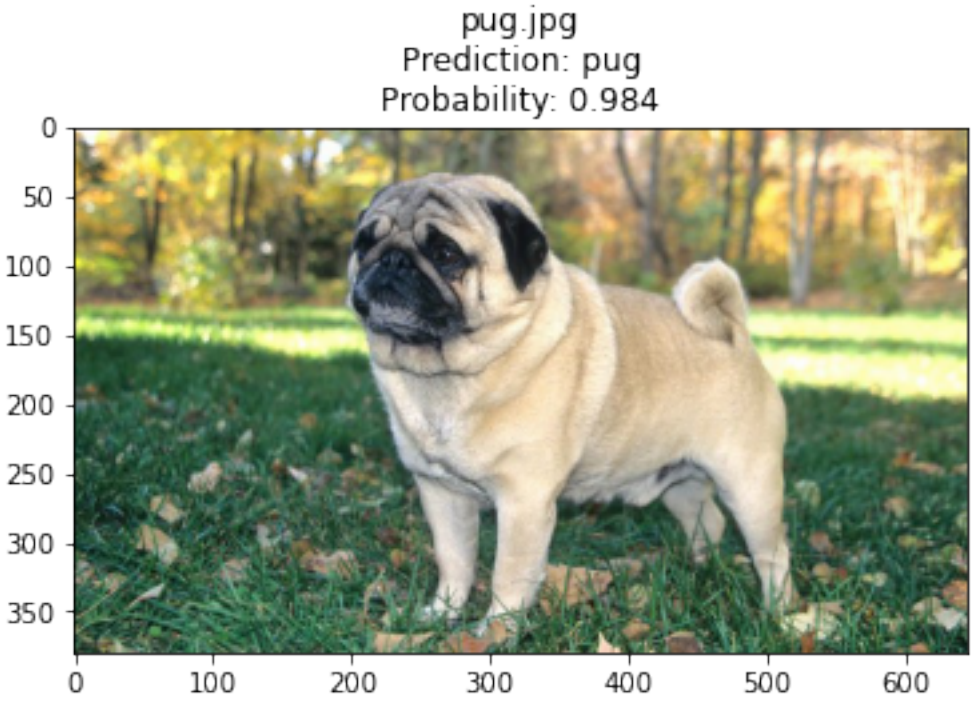

horseshoe_crab.jpg
Prediction: necklace
Probability: 0.232
0
200
400
600
800
1000
1200
1400
1600
0
500
1000
1500
2000
2500

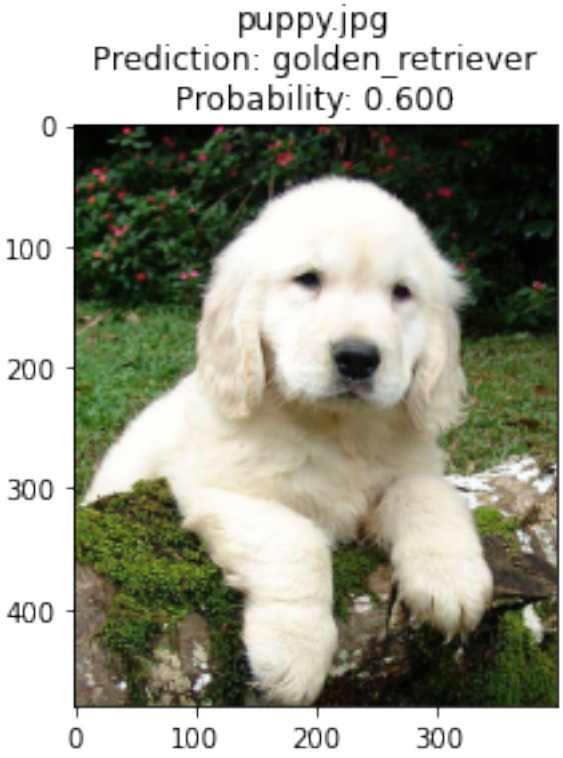

nuthatch.jpg
Prediction: robin
Probability: 0.348
0
100
200
300
400
0
100
200
300

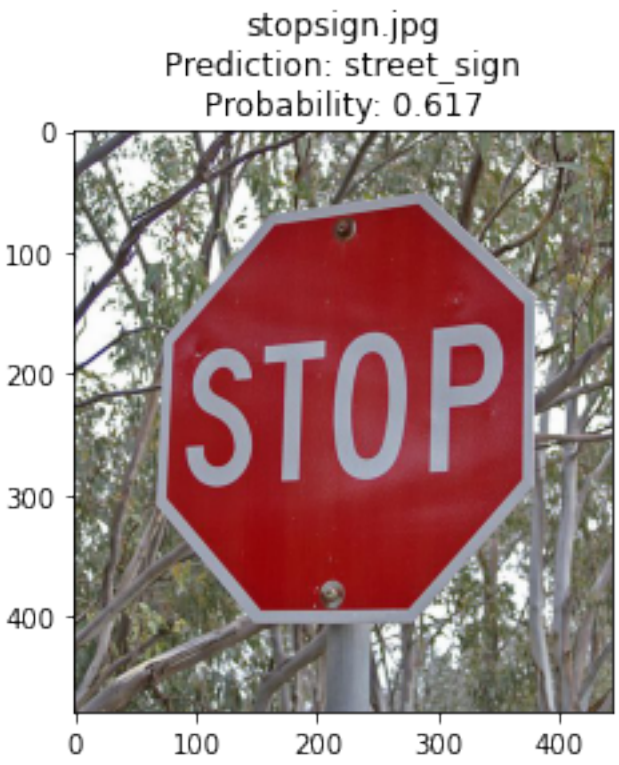

office.jpg
Prediction: file
Probability: 0.315
0
100
200
300
400
0
100
200
300
400
500
600

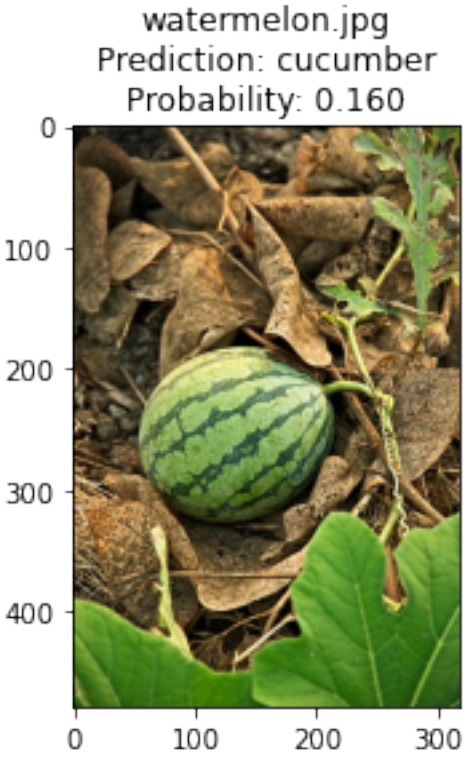

orangutan.jpg
Prediction: orangutan
Probability: 0.992
0
100
200
300
400
0
100
200
300


pig.jpg
Prediction: hog
Probability: 1.000
0
100
200
300
400
500
600
0
200
400
600
800


pug.jpg
Prediction: pug
Probability: 0.984
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600


puppy.jpg
Prediction: golden_retriever
Probability: 0.600
0
100
200
300
400
0
100
200
300


stopsign.jpg
Prediction: street_sign
Probability: 0.617
STOP
0
100
200
300
400
0
100
200
300
400


watermelon.jpg
Prediction: cucumber
Probability: 0.160
0
100
200
300
400
0
100
200
300

[ ]: