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Task 1

Core Function: *face_detect(img_path)*

Command to run: *python FaceDetector.py " img_path"*

Cascade Classifier:

- save/haarcascade_frontalface_default.xml
- save/haarcascade_profileface.xml

This function logic:

1. Load Cascade Classifier.
2. Loop over every image in the *img_path* that provided at command line. For example:
   - *"Project3_FaceDetection/Validation folder/images"*
3. Here I only use frontal face classifier.
4. Then detect the faces and append detected rectangles to a list.
5. Save the list to the *img_path* as json file.

Result:

```
(base) F:\UB\Huiyi_2020_Fall\computer_vision\project3\Task1>python ComputeFBeta.py "Project3_FaceDetection/Validation folder/images/results.json" "Project3_FaceDetection/Validation folder/ground-truth.json"
0.7777777777777778
```

Issues:

1. Command*: python FaceDetector.py "img_path"*
   This command can only be running once. The reason is the results.json will be generated at *img_path*, so whenever looping over images after the first run, the error will occur due to the script read results.json as image. To solve this, *img_path*/results.json has to be deleted before running the *FaceDetector.py*.
2. The profile face Cascade Classifier will also detect some front face. I tried to solve this by adding max/min size of the rectangles, but this will reduce f_β score by 0.4.
3. I tried to use both front face and profile face Cascade Classifier, this will drop the f_β score by 0.11.