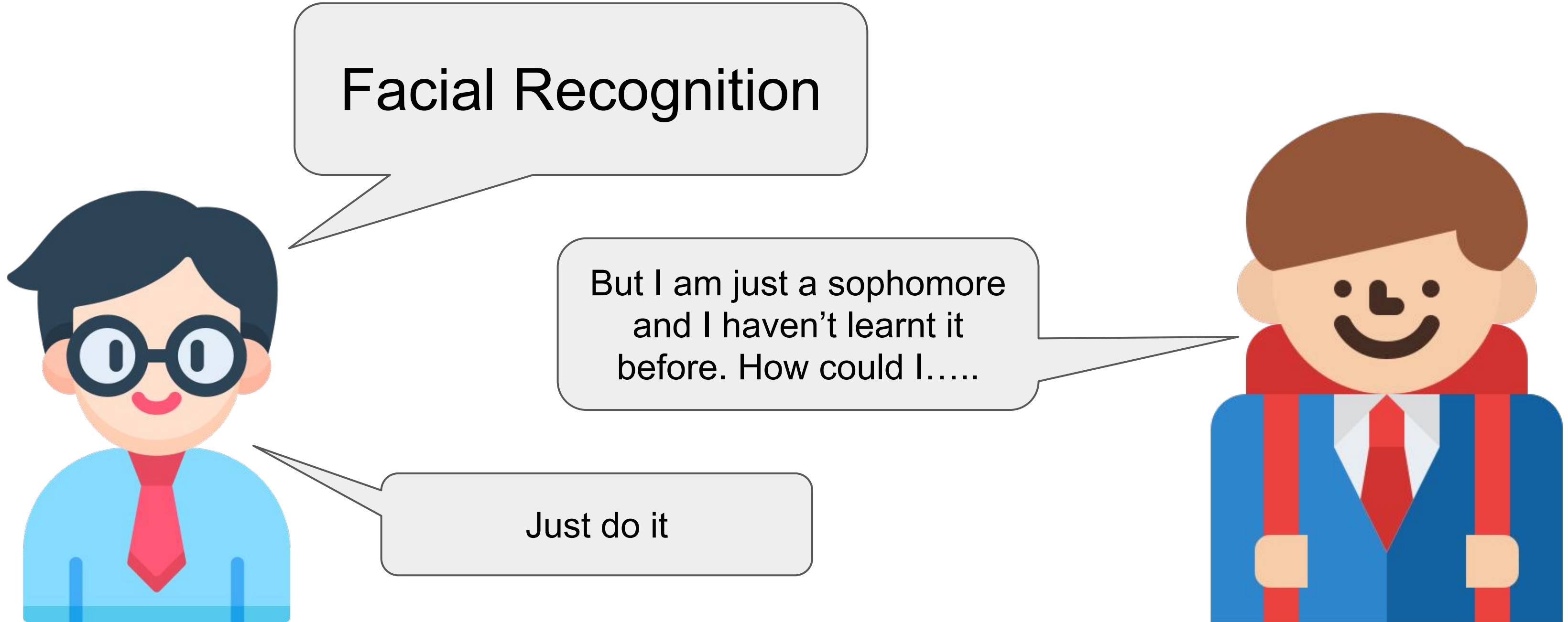
Greeting Device

Petchtechin Pecthsiripan 61011453
Pacharapol Vorravanpreecha 61011454

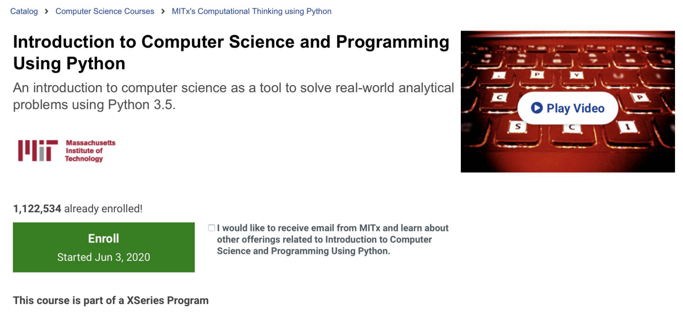
~~Platform for supporting classroom activities~~


Facial Recognition
But I am just a sophomore and I haven't learnt it before. How could I…..
Just do it

My Benefactors

pyimagesearch

You can master Computer Vision, Deep Learning, and OpenCV



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An introduction to computer science as a tool to solve real-world analytical problems using Python 3.5.

Massachusetts Institute of Technology

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Started Jun 3, 2020

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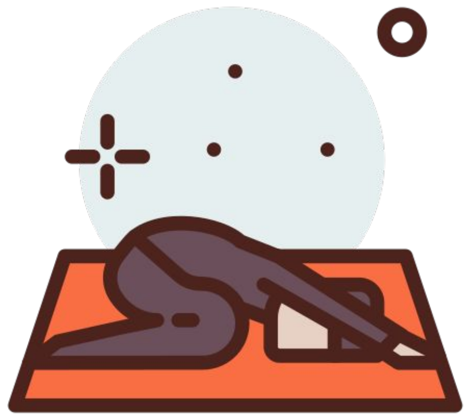

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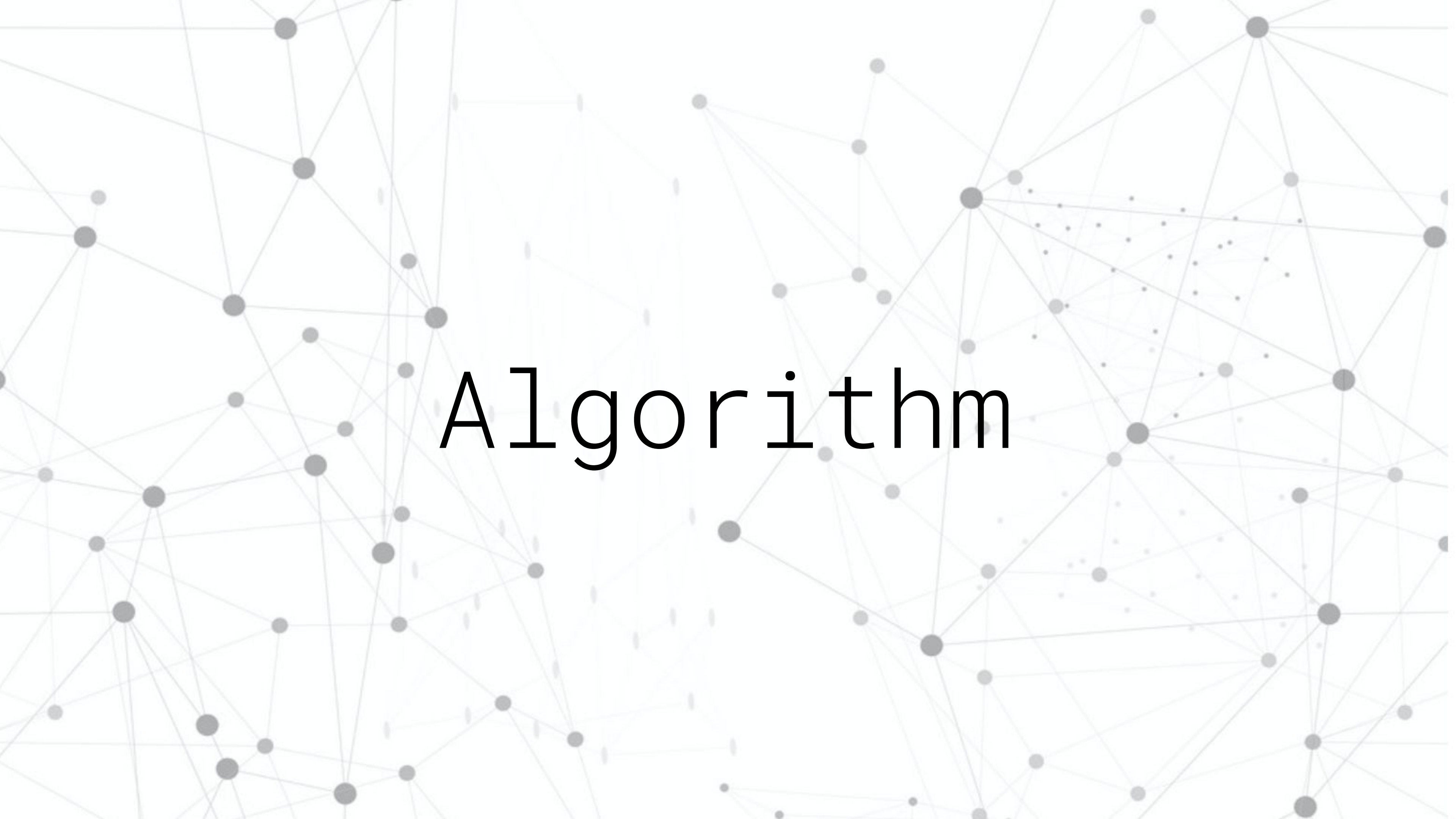
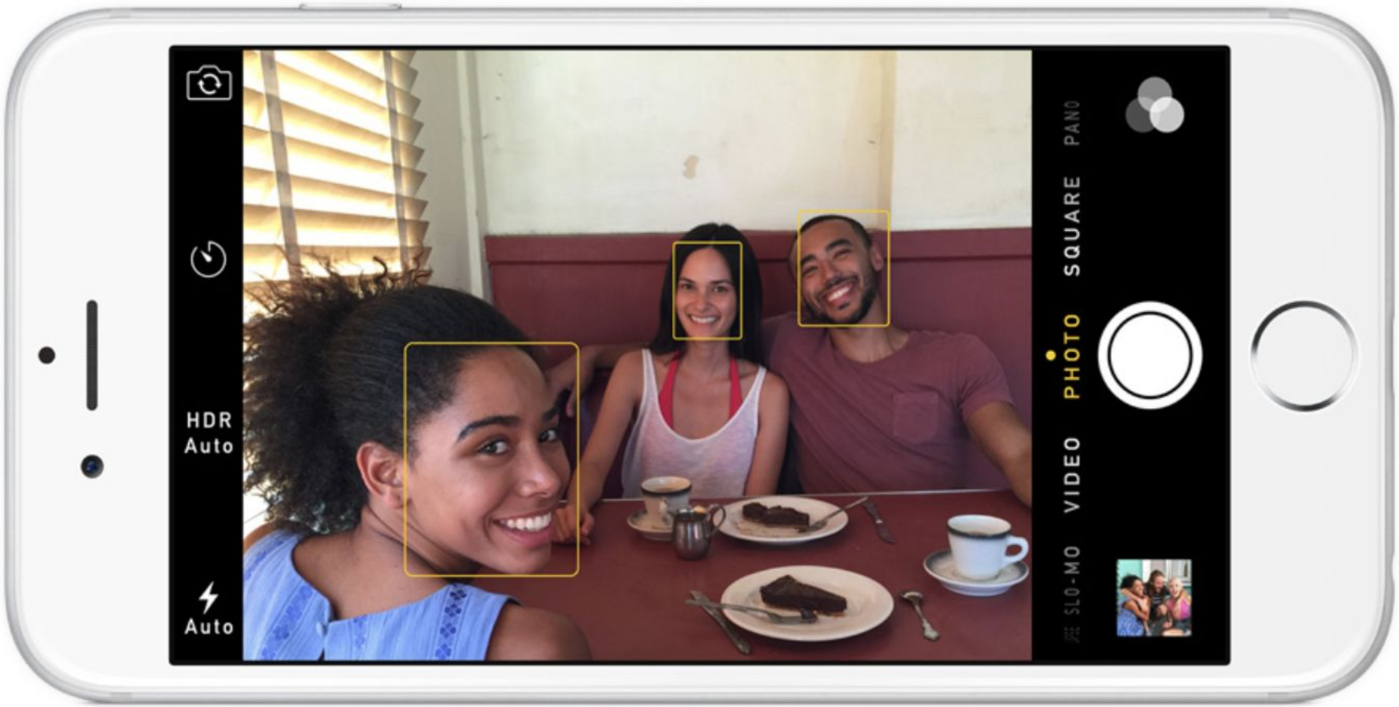
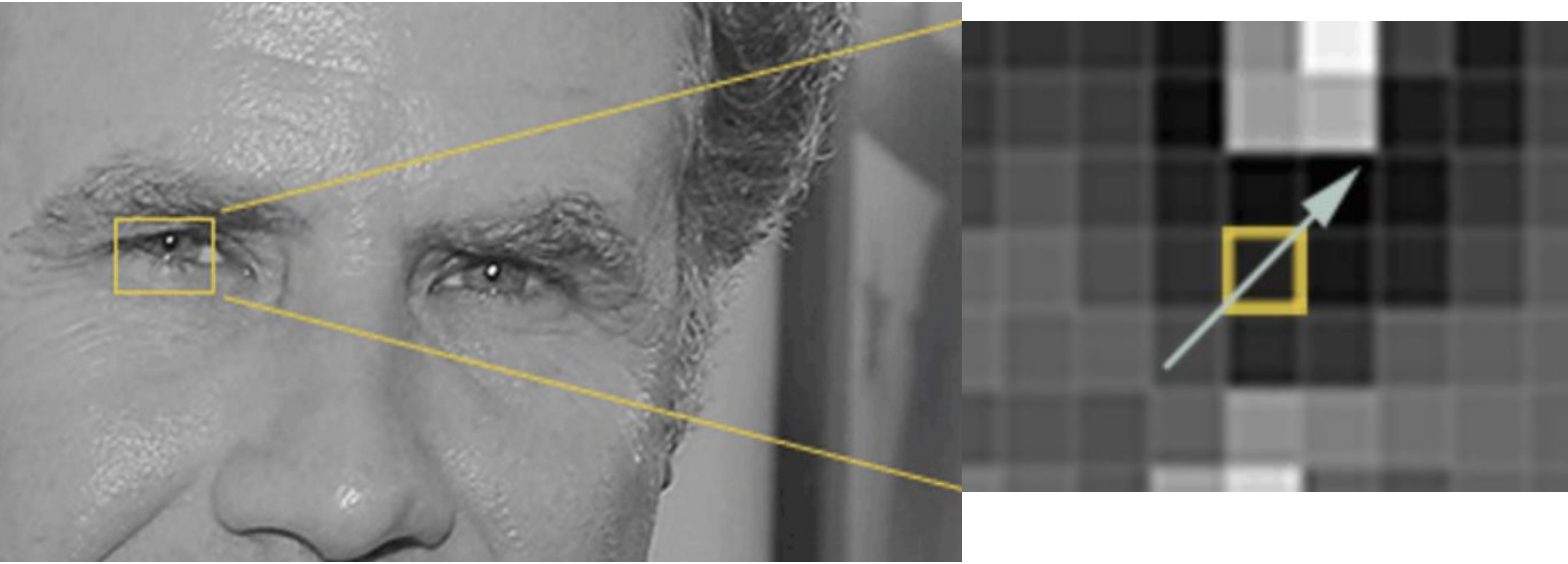


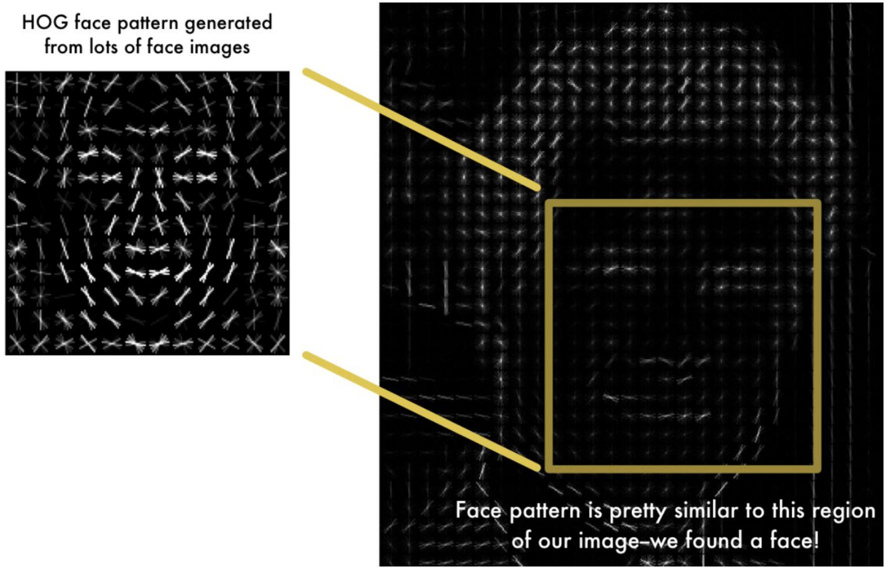
Algorithm

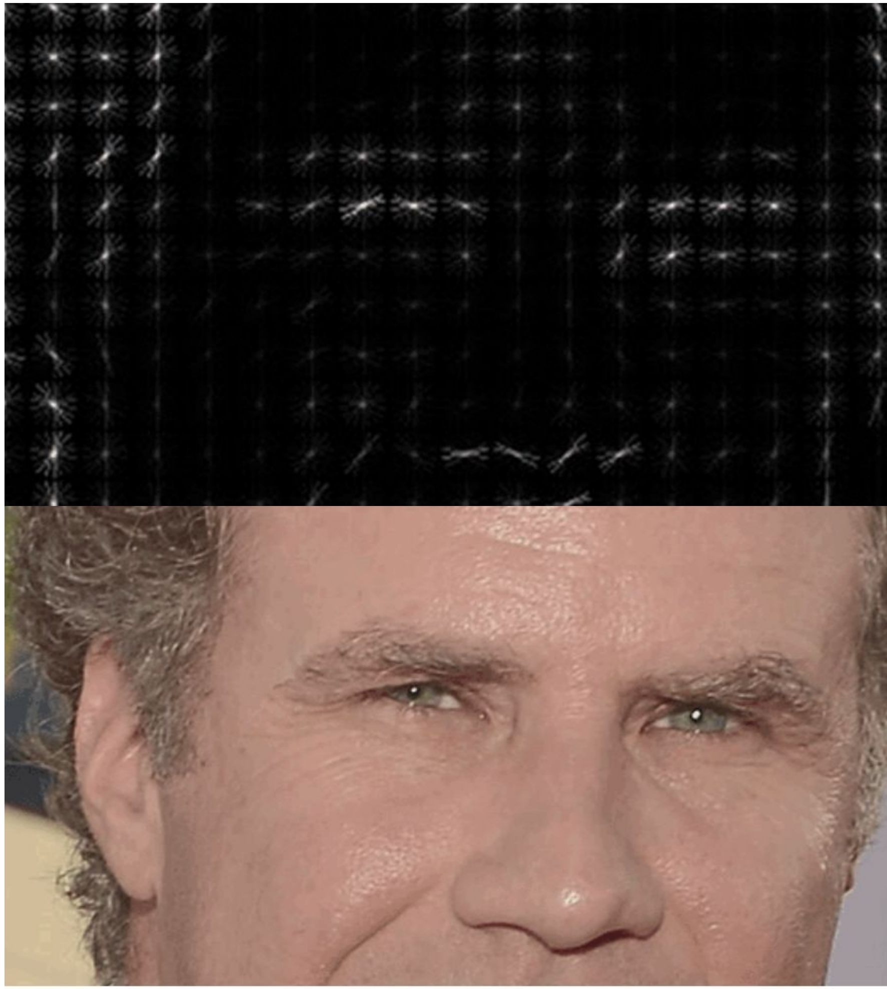
Finding all the faces



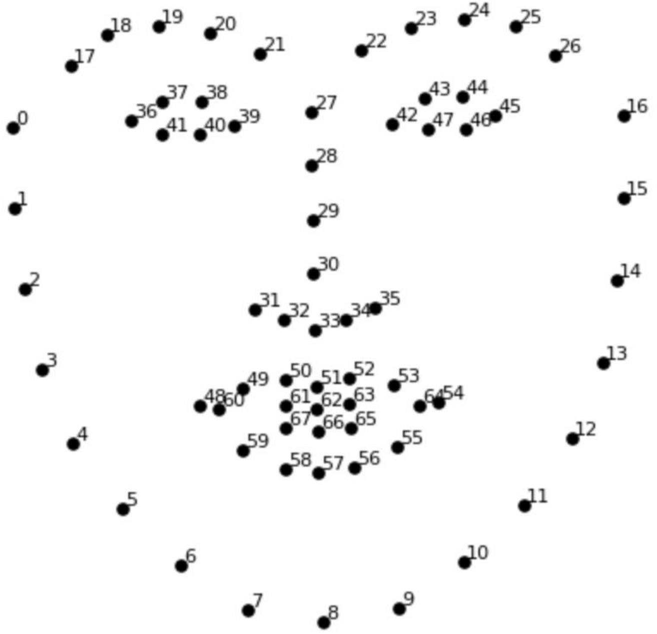
HOG

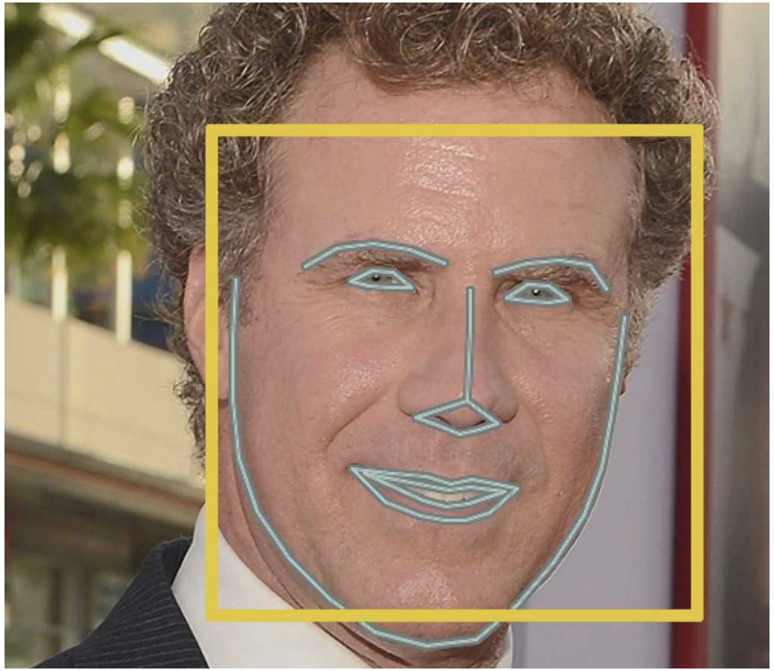


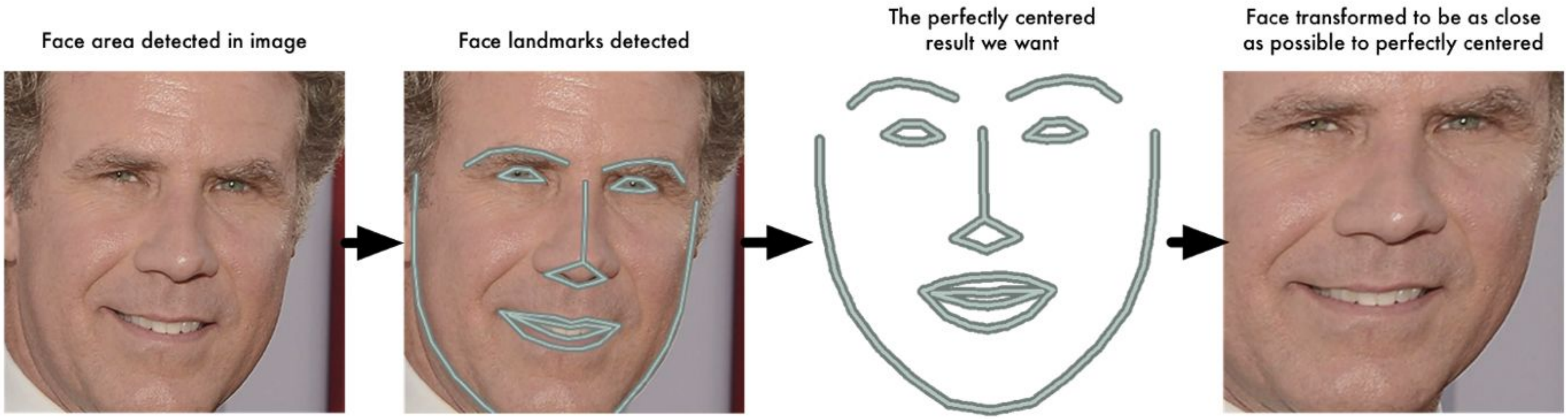

HOG face pattern generated from lots of face images
Face pattern is pretty similar to this region of our image–we found a face!



Posing and Projecting Faces

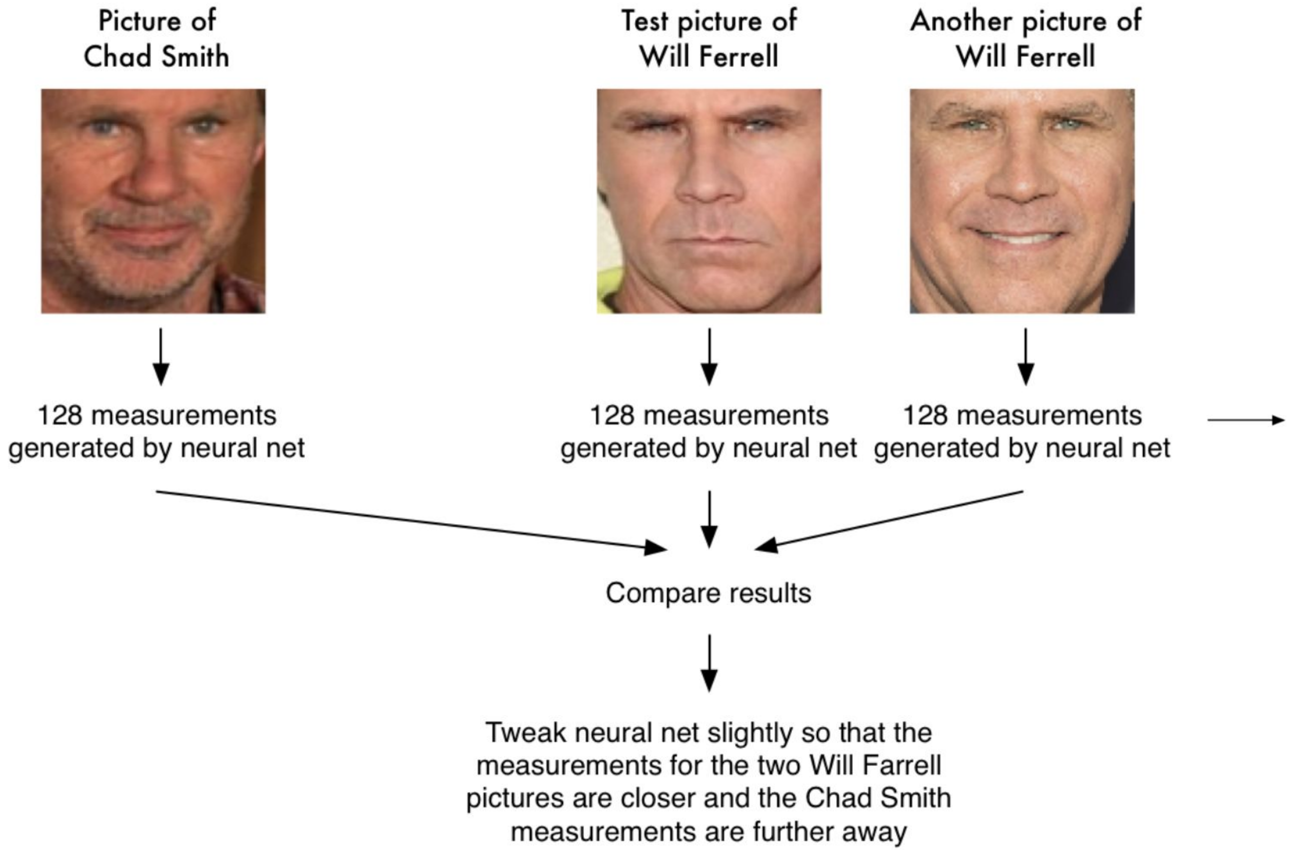


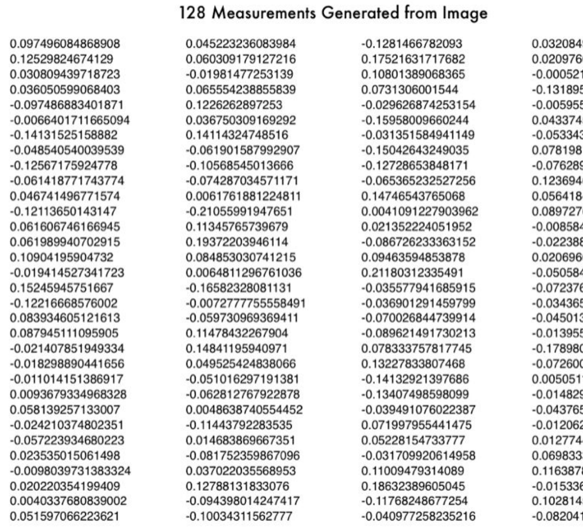



Face area detected in image
Face landmarks detected
The perfectly centered result we want
Face transformed to be as close as possible to perfectly centered

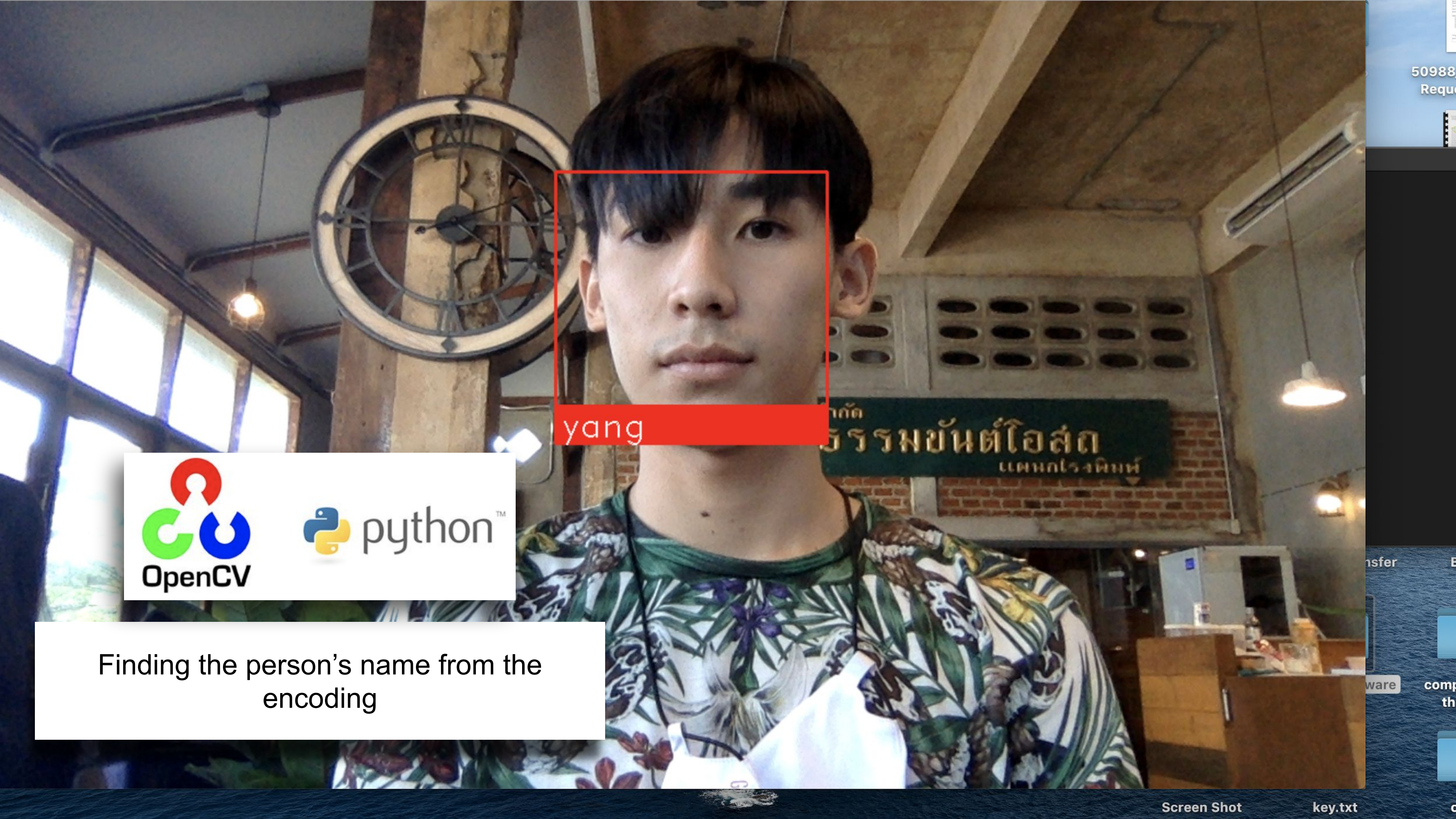
Encoding Faces

The training process works by looking at 3 face images at a time:

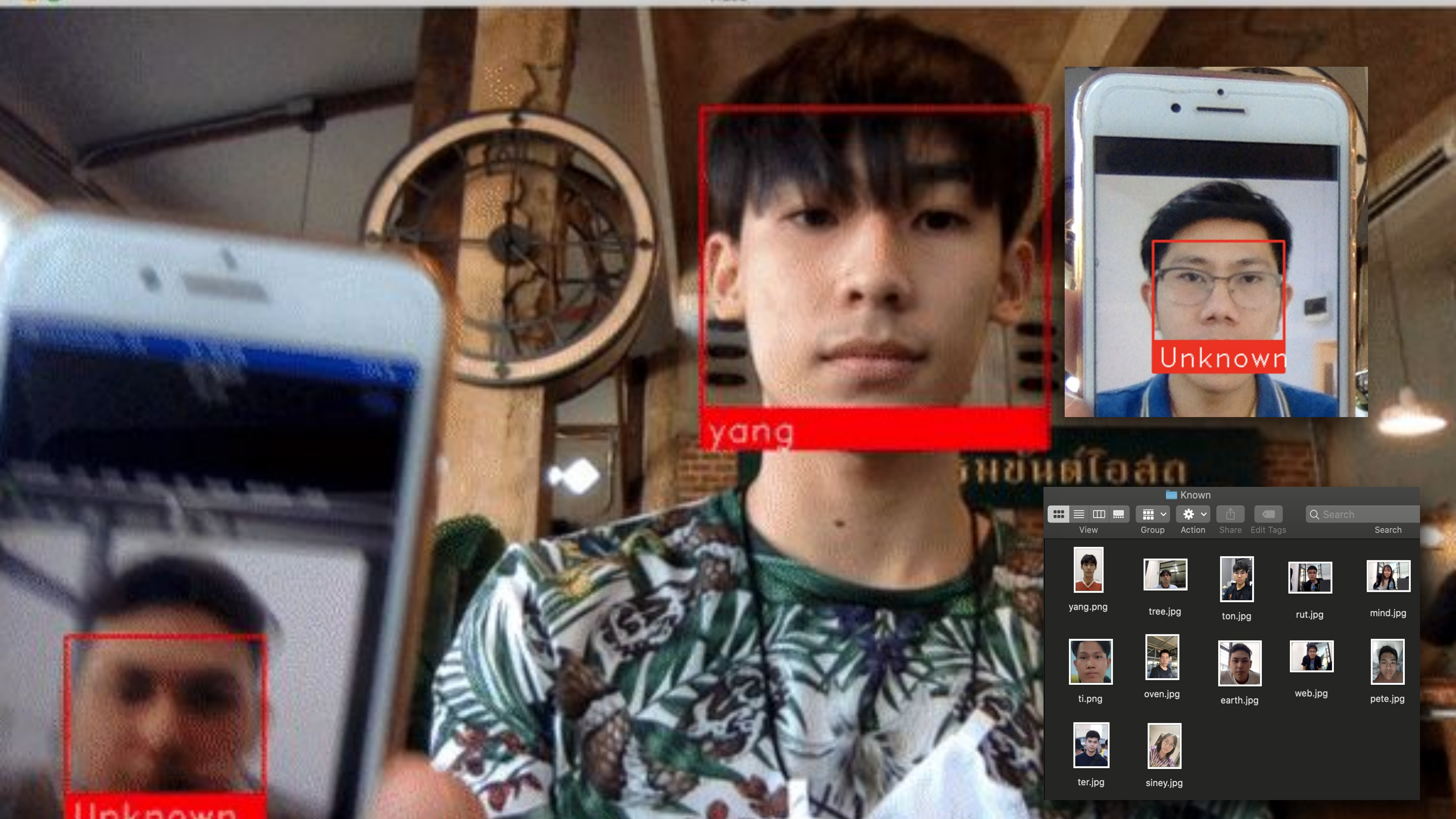

Picture of Chad Smith
Test picture of Will Ferrell
Another picture of Will Ferrell
128 measurements generated by neural net
128 measurements generated by neural net
128 measurements generated by neural net
Compare results
Tweak neural net slightly so that the measurements for the two Will Farrell pictures are closer and the Chad Smith measurements are further away


128 Measurements Generated from Image

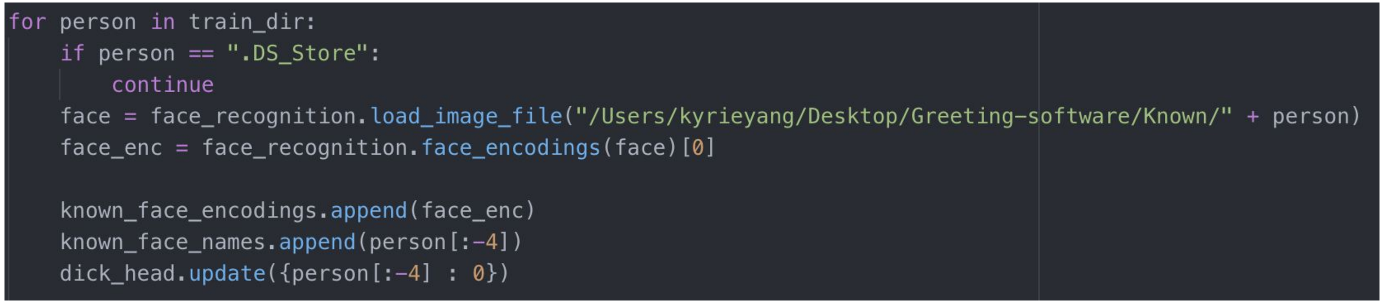
0.097496084868908	0.045223236083984	-0.1281466782093	0.032084
0.12529824674129	0.060309179127216	0.17521631717682	0.020976
0.030809439718723	-0.01981477253139	0.10801389068365	-0.000521
0.036050599068403	0.065554238855839	0.0731306001544	-0.131895
-0.097486883401871	0.1226262897253	-0.029626874253154	-0.005955
-0.0066401711665094	0.036750309169292	-0.15958009660244	0.043374
-0.14131525158882	0.14114324748516	-0.031351584941149	-0.053343
-0.048540540039539	-0.061901587992907	-0.15042643249035	0.078198
-0.12567175924778	-0.10568545013666	-0.12728653848171	-0.076289
-0.061418771743774	-0.074287034571171	-0.065365232527256	0.123694
0.046741496771574	0.0061761881224811	0.14746543765068	0.056418
-0.12113650143147	-0.21055991947651	0.0041091227903962	0.089727
0.061606746166945	0.11345765739679	0.021352224051952	-0.008584
0.061989940702915	0.19372203946114	-0.086726233363152	-0.022388
0.10904195904732	0.084853030741215	0.09463594853878	0.020696
-0.019414527341723	0.0064811296761036	0.21180312335491	-0.050584
0.15245945751667	-0.16582328081131	-0.035577941685915	-0.072376
-0.12216668576002	-0.0072777755558491	-0.036901291459799	-0.034365
0.083934605121613	-0.059730969369411	-0.070026844739914	-0.045013
0.087945111095905	0.11478432267904	-0.089621491730213	-0.013955
-0.021407851949334	0.14841195940971	0.078333757817745	-0.178980
-0.018298890441656	0.049525424838066	0.13227833807468	-0.072600
-0.011014151386917	-0.051016297191381	-0.14132921397686	0.005051
0.0093679334968328	-0.062812767922878	-0.13407498598099	-0.014829
0.058139257133007	0.0048638740554452	-0.039491076022387	-0.043765
-0.024210374802351	-0.11443792283535	0.071997955441475	-0.012062
-0.057223934680223	0.014683869667351	0.05228154733777	0.012774
0.023535015061498	-0.081752359867096	-0.031709920614958	0.069833
-0.0098039731383324	0.037022035568953	0.11009479314089	0.116387
0.020220354199409	0.12788131833076	0.18632389605045	-0.015336
0.0040337680839002	-0.094398014247417	-0.11768248677254	0.102814
0.051597066223621	-0.10034311562777	-0.040977258235216	-0.082041



Finding the person’s name from the encoding

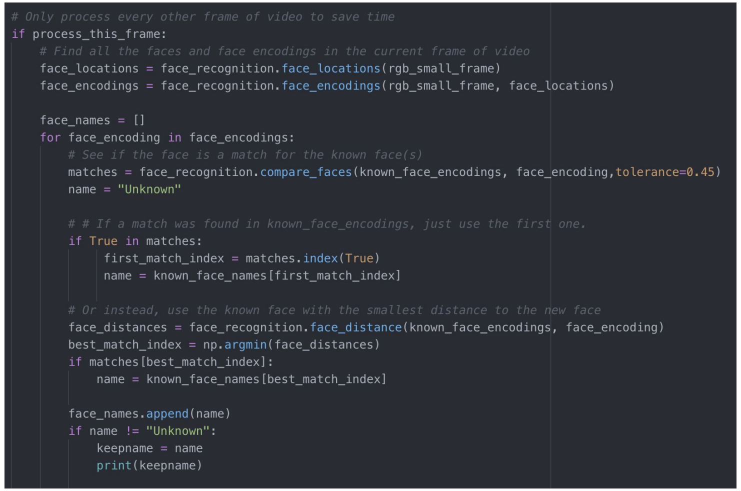

yang
Unknown
Unknown
Known
View
Group
Action
Share
Edit Tags
Search
yang.png
tree.jpg
ton.jpg
rut.jpg
mind.jpg
ti.png
oven.jpg
earth.jpg
web.jpg
pete.jpg
ter.jpg
siney.jpg

Run through a directory to store each person’s encoding face and name in lists



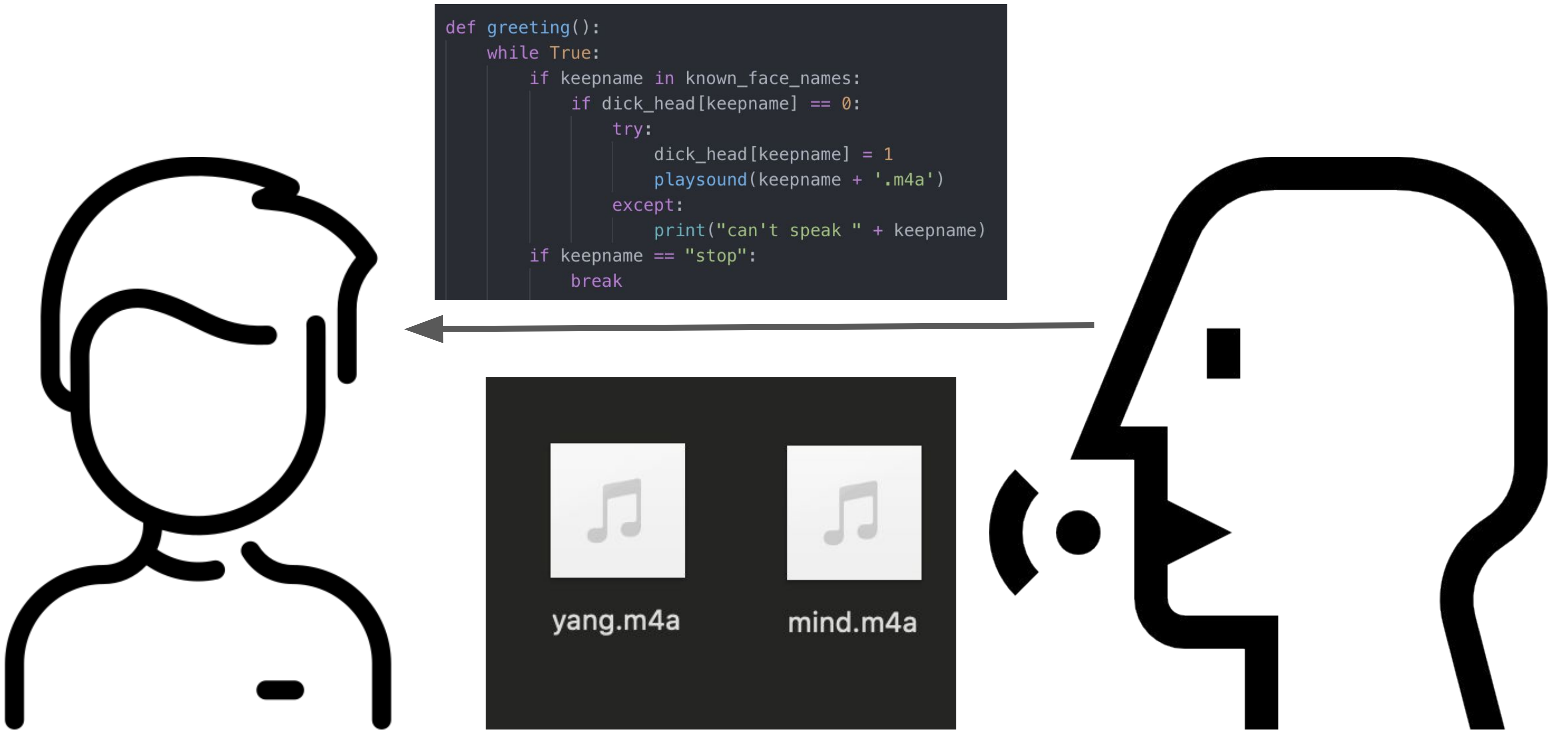
```python
for person in train_dir:
    if person == ".DS_Store":
        continue
    face = face_recognition.load_image_file("/Users/kyrieyang/Desktop/Greeting-software/Known/" + person)
    face_enc = face_recognition.face_encodings(face)[0]

    known_face_encodings.append(face_enc)
    known_face_names.append(person[:-4])
    dick_head.update({person[:-4] : 0})
```

Open camera, and find all the faces, if the faces can’t match with known encoding faces, Set those faces to be “Unknown”



```python
# Only process every other frame of video to save time
if process_this_frame:
    # Find all the faces and face encodings in the current frame of video
    face_locations = face_recognition.face_locations(rgb_small_frame)
    face_encodings = face_recognition.face_encodings(rgb_small_frame, face_locations)

    face_names = []
    for face_encoding in face_encodings:
        # See if the face is a match for the known face(s)
        matches = face_recognition.compare_faces(known_face_encodings, face_encoding,tolerance=0.45)
        name = "Unknown"

        # # If a match was found in known_face_encodings, just use the first one.
        if True in matches:
             first_match_index = matches.index(True)
             name = known_face_names[first_match_index]

        # Or instead, use the known face with the smallest distance to the new face
        face_distances = face_recognition.face_distance(known_face_encodings, face_encoding)
        best_match_index = np.argmin(face_distances)
        if matches[best_match_index]:
            name = known_face_names[best_match_index]

        face_names.append(name)
        if name != "Unknown":
            keepname = name
            print(keepname)
```

Use Multithreading to play the sound separately for making a greeting to each known person



```python
def greeting():
    while True:
        if keepname in known_face_names:
            if dick_head[keepname] == 0:
                try:
                    dick_head[keepname] = 1
                    playsound(keepname + '.m4a')
                except:
                    print("can't speak " + keepname)
        if keepname == "stop":
            break
```