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Springboard ML course unit 20.5 Capstone Submissions 3
Machine Learning Engineering Career Track Capstone: Machine Learning / Deep Learning Prototype
This submission shows how to collect a big dataset for training the model

Capstone project: This project will build a ML application for recognizing people with masked face. It is a research project. Goals of the project:

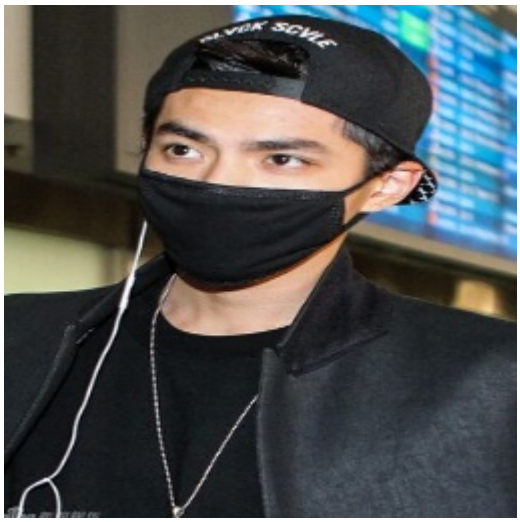
- Able to recognize a person as same person when he/she is with or without a mask, from a webcam or IP camera
- It will be deploymented as a web application or a off-line application (Windows version or/and Linux version)
- It can be used in a small or middle size company for general entry management

Development approach

1 Collect images of people with mask and without mask
2 Use Dlib CNN face detector to detect face from images. Use Dlib 128D vector(face) generated from each sample image as train/test data
3 Use K Nearst Neighbors(KNN) model as face recognition model
4 First will train KNN with only masked face images. I split images data as two groups of train and test. In the train group, it has nine people folders. Each person has 7-16 picture. The test group put all images in one folder. Those images are not used for training
5 Adjust parameters/models
Face detector: HOG, CNN
KNN model: Number of neighbors. weights: {‘uniform’, ‘distance’}. algorithm: {‘ball_tree’, ‘kd_tree’, ‘brute’}.
Trained model: distance threshold: {0.6, 0.5, 0.4}. Bascally 0.6 can be considered as same person

The process of collecting image files

Step 1: Get masked face pictures from internet
Search internet for images of movie stars, famous singers. Anotate and group those pictures for training
We collected more than 300 pictures and group to 30 people
We got more than thusand masked pictures from a public github site posted by Wuhan University



step2: take pictures for employees with mask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Stepp 3: re-mask for iBUG image files
iBUG image files were used for training dlib face detector and face landmarks predictor.
However those files are not with mask. We put mask on the face for some of those image files.
We plan to use the masked files to train face detector and face landmarks predictor
This will get more than thousand files