

Project Title : Face detection based home security system

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Project Description :

The security alarm system is to be designed using Arduino . Human face will be given to the designed system. If detected image is a family member , the system will glow the green light and it will allow them whereas others will be prevented by glowing red light.

Part : 1

Generating dataset (Collecting large no.of family members images)

Part : 2

Training an Owner / Not Owner detector using deep learning

Part : 3

Deploying our results to the Arduino UNO .

Project workflow :

- First we classified our image dataset using Convolutional Neural Network(CNN) and Keras.
- Then we trained our CNN image classifier with Keras.
 - Here we are having few step :
 - 1) Load our image dataset from disk
 - 2) Pre-process the images
 - 3) Instantiate our Convolutional Neural Network
 - 4) Train our image classifier
 - For this training we are having python code . While compiling we have to give path for dataset and trained model.
 - Eg : `python train_network.py --dataset images --model owner_not_owner.model`
- Evaluating our CNN image classifier.
 - While compiling the test python code , we have to give our trained model we generated in the above step .

- Eg : `python test_network.py --model santa_not_santa.model \ --image examples/image.jpg`
 - It will produce an integer value 1 if that detected image is house member otherwise it will produce 0 .
- Deploying our results in the arduino software.
 - For deploying the results , we have used pyserial package .
By using this we can communicate between our python code and arduino software through arduino's serial port.
 - Based on the output value we got from the previous step , the arduino will glow green light or red light .

Code parts :

- 1) Training CNN image classifier (`train_network_final.py`)
- 2) Testing CNN image classifier (`test_network_final.py`)
- 3) Deploying results in the arduino software (`arduino_final.ino`)