Recognito

Course Project : EE2160

Agents of Chaos v3.0
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Introduction :

With Apple showing off with its facial recognition features to all the smartphone users of the world, we realised that facial recognition could be used for a lot of applications instead of mere unlocking a smartphone.

Recognito ,as the name suggests, recognises faces and gestures to improve the user's experience by customizing the surroundings like Air conditioning, music etc according to the user's preference. It implements a better control system in a complete automated IoT based environment.

Components :

1. Raspberry Pi 3
2. Webcam

Working :

The dataset for Recognito comprises of pictures of hand gestures and our faces. A User can initialise his/her preferences of surroundings like music genres and volume, thermostat, alarms etc in Recognito so that when the same user is in the room Recognito can adjust the modes accordingly without any input from the user. Users can manually override the settings too if the wish to do so.

Each gesture works as a command. We can adjust the brightness, volume, temperature and various other controls using their respective gestures.

We picked four gestures and mapped them to four functions (volume up & down and brightness up & down)
We had to hard-code coordinates of pictures for learning(as we did not have much knowledge about ML, we'll try improving our algorithm in the future)
RasPi sends a signal to the machine on which the server is set and that asks the machine to perform the required task.

About RasPi :

The Raspberry Pi 3, with a quad-core ARM Cortex-A53 processor, is described as 10 times the performance of a Raspberry Pi 1. This was suggested to be highly dependent upon task threading and instruction set use. Benchmarks showed the Raspberry Pi 3 to be approximately 80% faster than the Raspberry Pi 2 in parallelized tasks.
RasPi has RISC architecture.

Software :

- ➔ We used Raspbian, a Debian based LINUX OS.
- ➔ Installed required python packages for learning, Data analysis and image processing (SKlearn, SKimage, Pickle, Panda)
- ➔ Node JS to setup the server.

Debugging :

- ➔ We used a small dataset to train our model, hence many false positives.
- ➔ Could not optimise the code as we were using python.
- ➔ The hand portion of the image could not be detected in the absence of a sufficiently plain background(Noise due to any pattern in the background)