

# Haar Cascade Training Data

We created our own haar cascade to detect full bodies. The data used to train can be found at the following URL:

<http://www.lookingatpeople.com/download-daimler-ped-det-benchmark/index.html>

## Libraries

We are using OpenCV 2.4.10 with Python 2.7. All Python code was ran and tested using Ubuntu 14.04 LTS.

## Programs

### Python Programs

All Python code is located in the src/ directory.

#### DensityFlow.py

Displays a density map over the video.

**To run:** python DensityFlow.py [OPTIONS]

**For help:** python DensityFlow.py --help

#### CrowdTracking.py

This code handles crowd tracking using Lucas-Kanade. The program runs through the video twice. In the first run through the program simply tracks feature points using Lucas-Kanade. After it has ran through the video it goes through the recorded tracks and tries to remove invalid tracks.

After the program has all the cleaned up tracks it will display all the tracks and replay the video showing the recorded tracks overlaid with the video.

**To run:** python CrowdTracking.py [OPTIONS]

**For help:** python CrowdTracking.py --help

#### OBJCrowdTracking.py

This code handles crowd tracking using Haar Cascades and object detection.

**To run:** python OBJCrowdTracking.py [OPTIONS]

**For help:** python OBJCrowdTracking.py --help

#### Rectification.py

The algorithm first takes two pairs of parallel lines calculates the Affine rectification. This takes the perspective image to an affine image.

Next the algorithm takes two pairs of orthogonal lines calculates Metric rectification. This takes the affine image to a metric image.

The user is then given a display of the final rectified image where they can scale, rotate, and translate the results.

Finally, the resulting matrix is printed to the screen where the user can copy it for uses in other programs.

**To run:** python Rectification.py [OPTIONS]

**For help:** python Rectification.py --help

## Unity Program

There is also a 3D player that takes outputed tracks from either CrowdTracking.py or OBJCrowdTracking.py and displays the recorded data in a 3D enviroment.

The two versions of the program are:

LittleWalkingPeople.exe

LittleWalkingPeople\_FixedCamera.exe

Note these programs were ran and tested on Windows 7 with Unity 5 installed.