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 programs are:

LittleWalkingPeople.exe

LittleWalkingPeople_FixedCamera.exe

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