

Master's Project - Human Detection & Extraction using Kinect Depth Images
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Please find the following within the code archive

Source Code (in /src and /include)
HTML Doxygen Documentation (in /html)
Executable (in /bin)

Please Note :

Libfreenect and libusb libraries have been used in the project for enabling the communication between the Kinect sensor and the machine (MacBook Pro).

User Controls in the GUI:

TracKin detects human figures and extracts their contour from the scene. The extracted figure is shown in the Left pane titled "Tracked output". While the normal RGB output can be seen in the Right Pane.

The following are the guidelines for controlling the parameters in TracKin

The default values set initially are the optimised ones after many trials.

Right Pane:

I Canny

1. High Threshold - The upper threshold for Canny Edge Detection. Lower values yield good edges
2. Low Threshold - The lower threshold for Canny Edge Detection.

II Chamfer

1. Pyramid Levels - The number of levels the pyramid should have. Larger the value, better is the detection. However, larger values increase computation costs. Lower value yields poor results
2. Scale Factor per Level - The factor by which each consecutive layer of the pyramid is resampled
3. Chamfer Matches Per Level - The number of chamfer matches with the least RMS values per level of the pyramid to be considered for final threshold
4. Max Chamfer Matches to consider - The number of chamfer matches, out of all pyramid levels, to be considered for 3D model fitting

III Locate Head

1. Search Radius Threshold - The threshold with which the radius of the circular region is added and subtracted to form a disc region. This is where the circular edges are searched
2. Max. Locations to Consider - The number of regions to consider after calculating the squarer error between the ideal and real hemisphere models.
3. Chop Radius Threshold - The minimum radius below which the circles get ignored
4. Max. heads to considered - The number of persons in the scene (Currently working for 1 & 2 only)

iV Extract

1. Planar Canny High - The high threshold for canny edge detection after planar filtering
- 2 Planar Canny Low - The low threshold for canny edge detection after planar filtering
3. Depth Threshold - The threshold that is useful forming a range of depth values, lying within which the pixel is extracted

LEFT PANE:

1. Angle - Controls the tilt angle of the Kinect
2. The drop down switches between the video modes
3. The radio buttons change the LED state of the Kinect

TrackKin does not start, till the TrackK button is pressed. Best results are obtained when standing in the range of 1 to 2 metres from Kinect.