# User Manual

Project Kitchen Occupation

TSBB11 HT 2013

Version 1.0


Status

| | | |
|---|---|---|
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| Approved | | |

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# Project Kitchen Occupation

Bilder och Grafik CDIO, HT 2013
Department of Electrical Engineering (ISY), Linköping University

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# Document history

| Version | Date | Changes | Sign | Reviewed |
|---|---|---|---|---|
| 0.1 | 2013–12–13 | Initial draft | MS | MT |
| | | | | |

# 1 Installing the system

### 1.0.1 Hardware

Each Kinect camera must be installed above a door with no overlapping view shared with any other Kinect camera. The Kinect must point down or slightly angled towards the room. A minimum distance of 50 cm is required from the lense of the Kinect and the top of the door. Each Kinect must be connected to a power source, and to a device running the system software using USB.

### 1.0.2 Software

There are two versions of the software, one with a calibration and configuration GUI and one lightweight version without a GUI. In order for the lightweight version to work a configuration file, persumably generated by the GUI version, is required. The configuration file is best generated using the configuration program, and then copied to the system running the non-GUI variant.

Linux, OS-X or Windows is required on the machine running the software. Atleast one Kinect camera must be connected before starting the software. More than one Kinect camear is currently only working on Linux and OS-X. Some software libraires are required to compile the program, these are listed in table **??**

| | |
|---|---|
| OpenCV2 | Needed for general image processing |
| libFreenect | Needed for communication with kinect on unix like systems |
| OpenNI | Needed for communication with kinect on windows systems |
| libCurl | Needed to send http requests to the report API |
| QT5 | Needed for the gui code, not used in headless variant |

# 2 Calibrating the system

Calibrate the height...

Figure 2.1: *System overview.*

variables...

# 3 Configuration the system

Available configuration settings is checkpoint circles, door mask area, exclusion mask and grayscale height threshold settings.

The circles should be placed so persons walking into the room inevitable will pass all three lines. They should also be more inside the room compared to the door mask area. A good placement is illustrated in figure 3.1. Note that the red, most inner circle, includes the upper corners of the door frame. Too small inner circle will cause people to miss it and therefore not detected.

The door mask should cover the area close to the door where people appear. It is important to make this area big enough, rather too big than too small. It can, but should not cover the upper, most distant, part of the red circle, figure 3.2 illustrates this.

Exclusion masks should cover areas where people can not walk or appear. This could be areas like tables or areas behind the door (walls in this case), figure 3.3 illustrates this. Note that for long usage of the system, movable furniture should not be excluded.

This threshold level is used to adjust the system for the current installation height of the camera. It sets a configuration parameter called lowestDistanceOverFloor: This is the limit of how short a person can be. The threshold should be set so that a normal person's chest height is not removed by the thresholding. ALEX(ELLER NGN ANNAN) FIXA FIGUR HÄR OCH FÖRKLARA MER KANSKE. KANSKE INTE SKA STÅ HÄR ENS, KANSKE UNDER CALIBRATE THE SYSTEM?

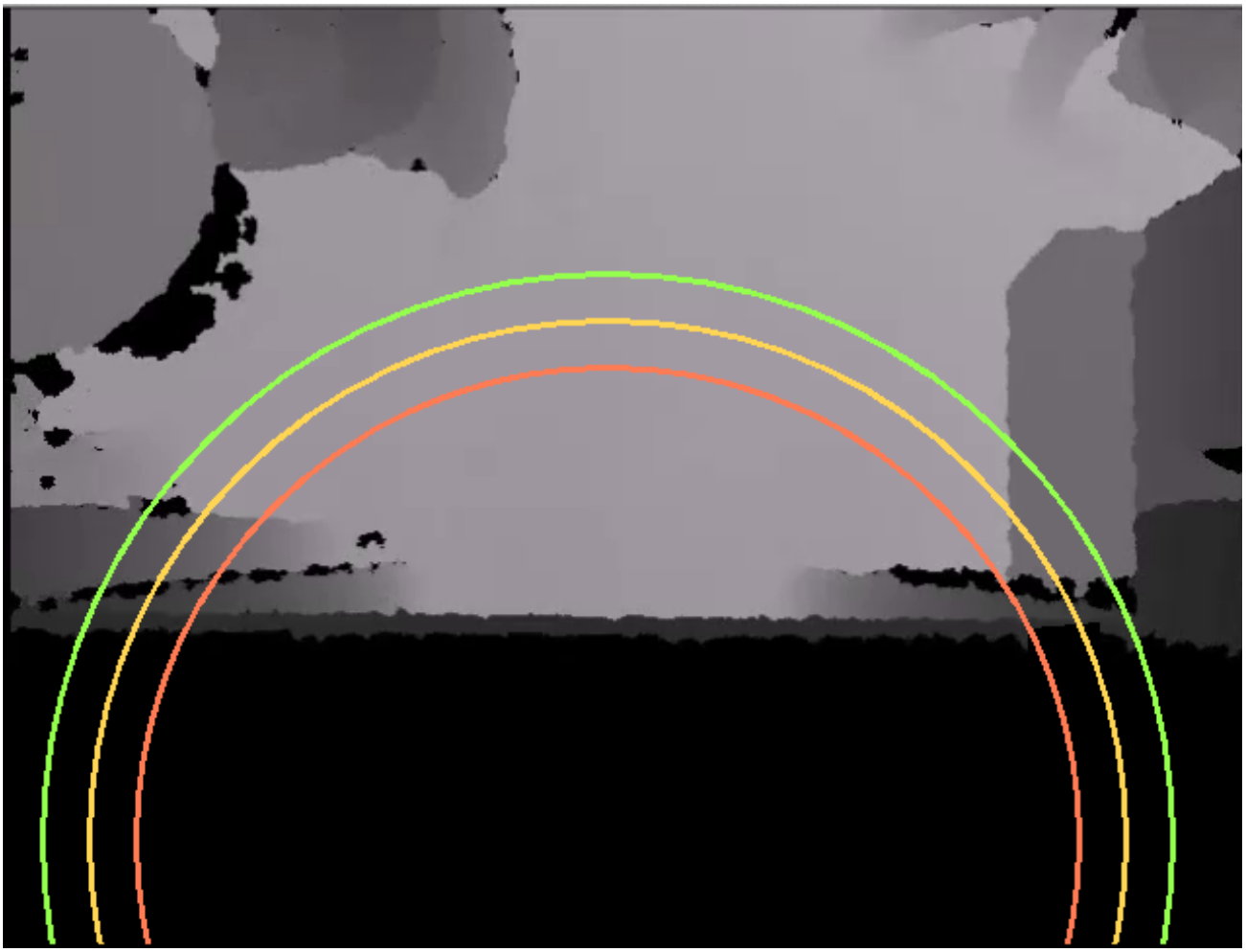

Figure 3.1: *A prefered placement of the circles.*

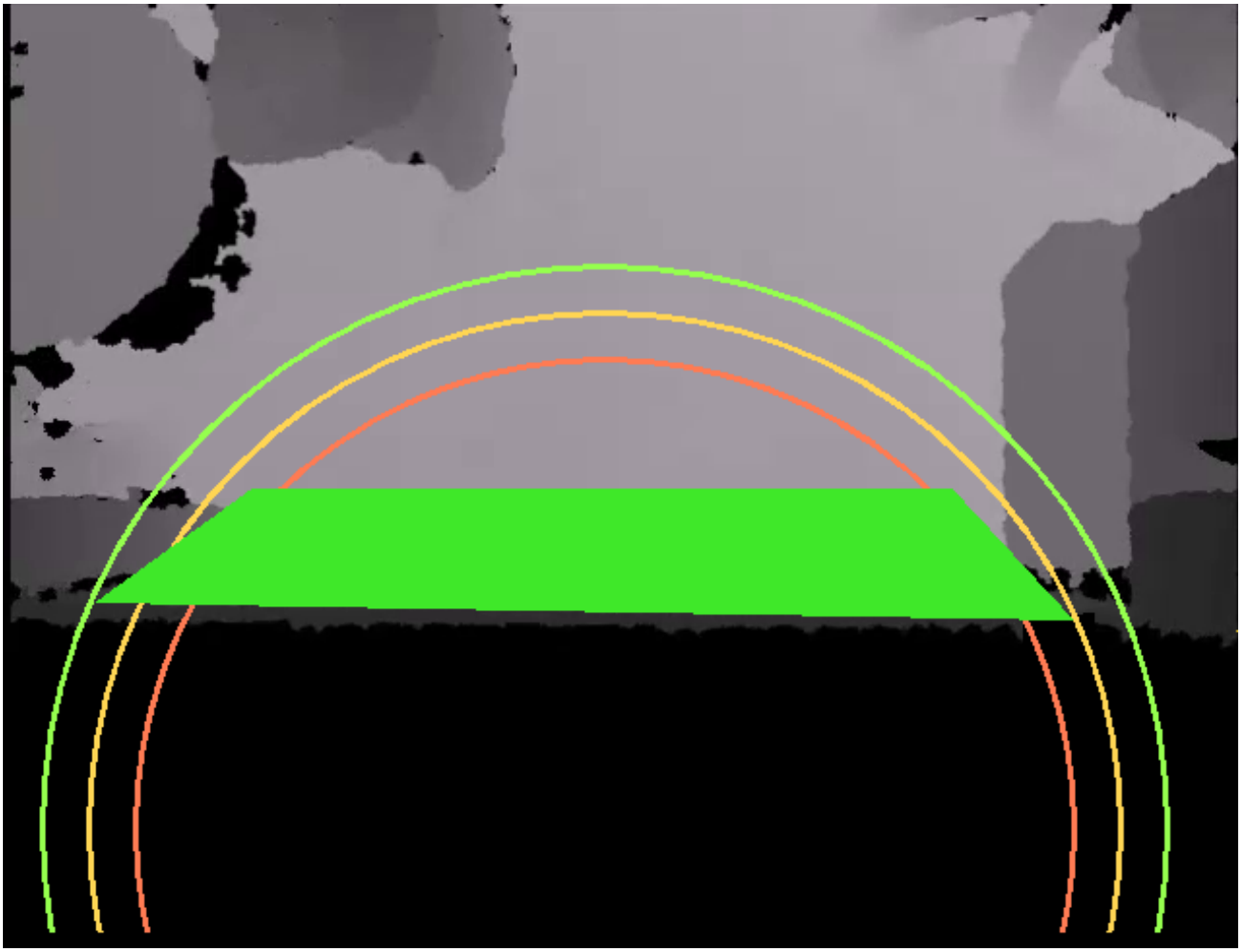

Figure 3.2: *The prefered placement of the door mask, the door mask is the green area.*

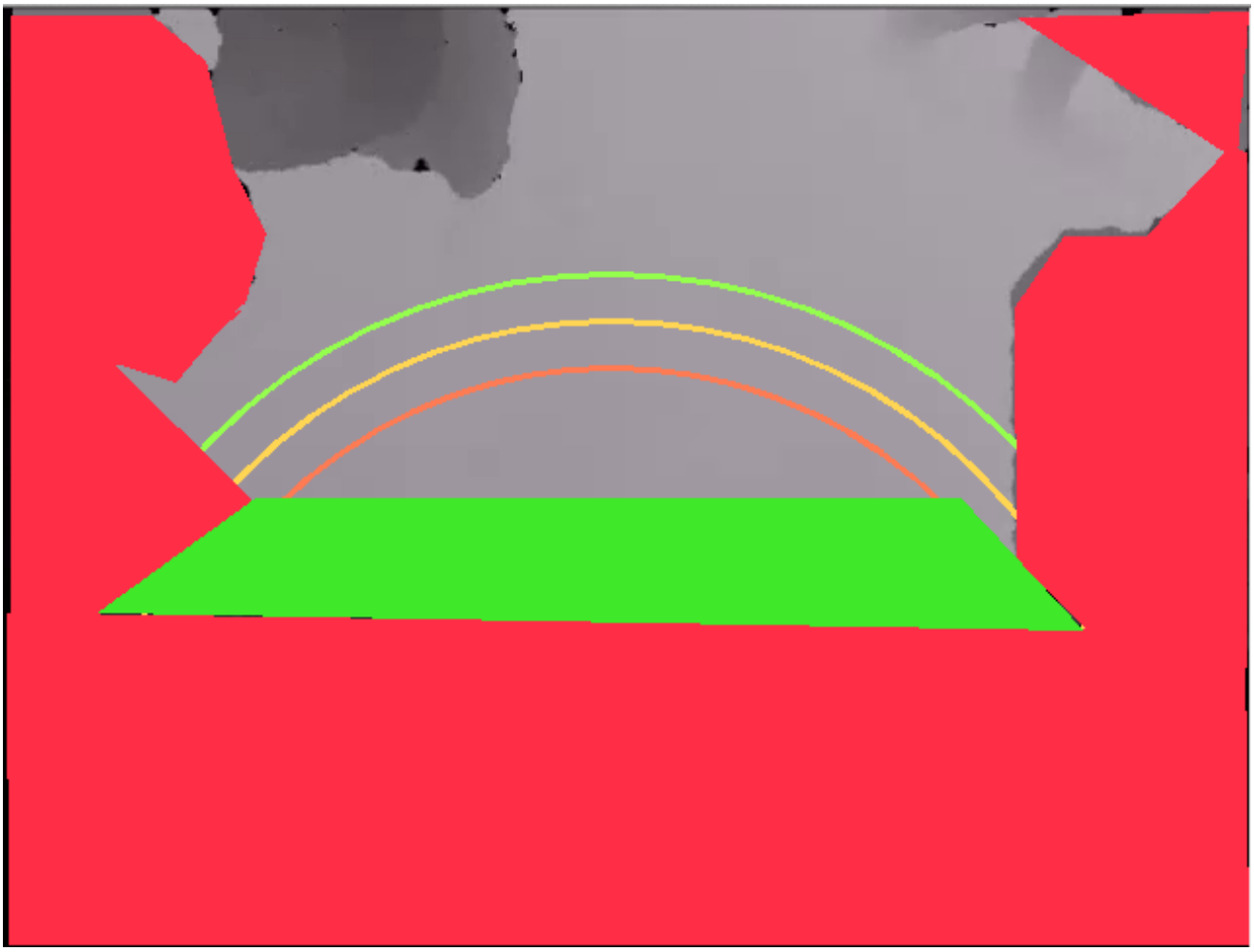

Figure 3.3: *Exclusion mask is marked as red. It covers areas where people can not walk or appear.*

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