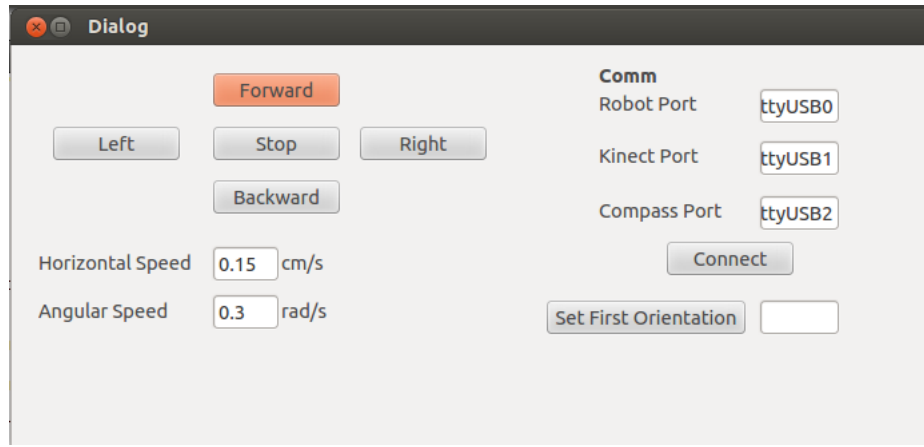


ISL Framework Tutorial

- **Irobot Dialog:** This dialog window is to control the movement of the irobot



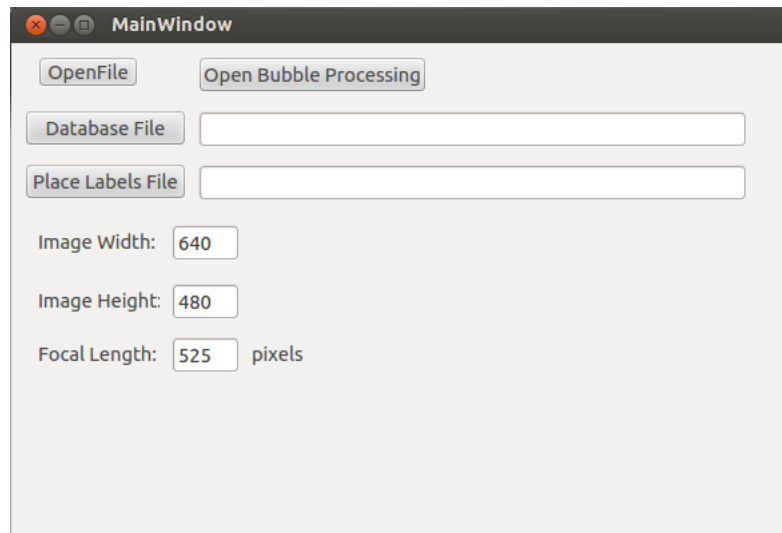
Functions of Buttons:

Connect: To make the connection of the robot

Forward, Backward, Left, Right: To move the robot forward, backward, to left and to right respectively.

Stop: To stop the robot

- **Main Window Dialog:** This dialog window is to set the database path and the properties of the images



Database File: To set the path of the database file that the bubble spaces will be written

Place Labels File: To set the path of the place label file

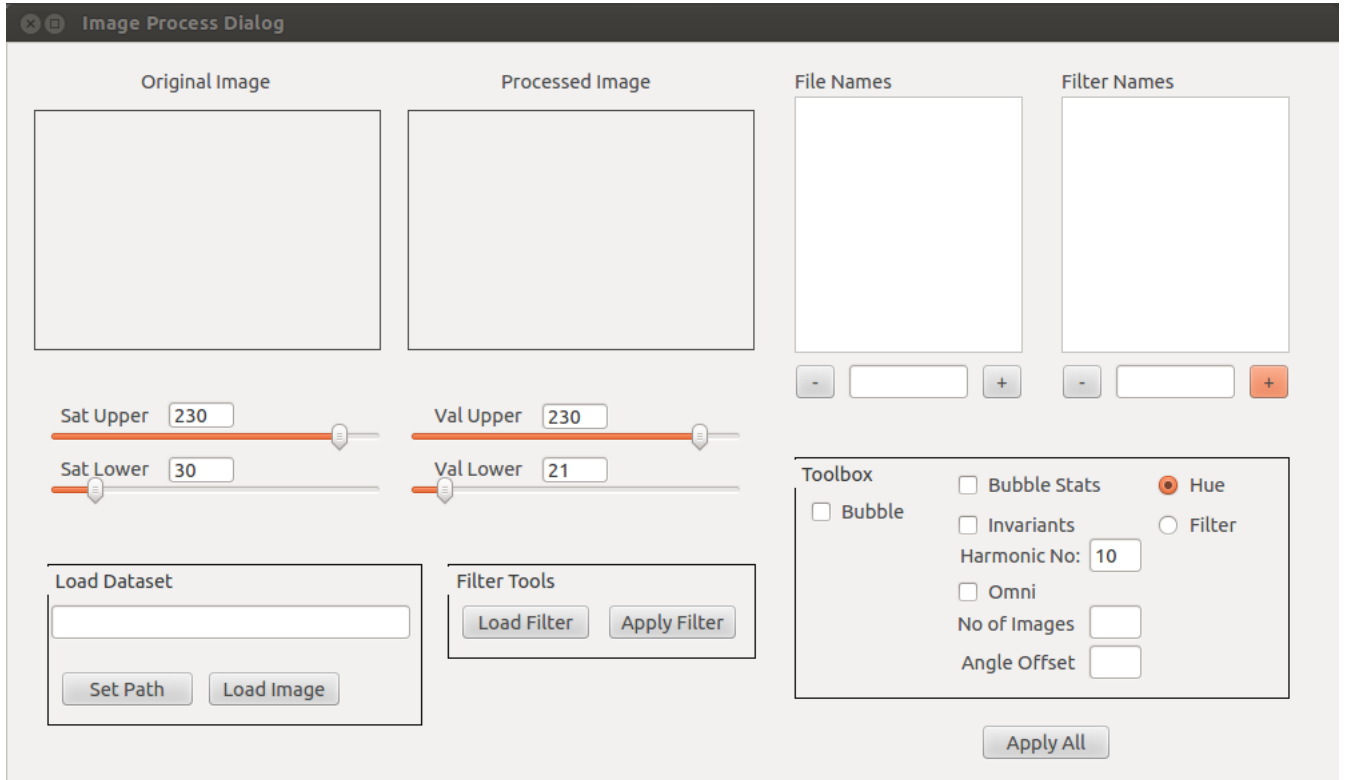
Image Width, Image Height: It is necessary to specify the dimensions of the images used for bubble space construction, the default values are for Kinect images.

Focal Length: It is necessary to calculate the focal length of the images in pixel for bubble space calculations.

Open File: Button to open bubble space and descriptors construction Dialog window.

Open Bubble Processing: Button to open bubble space visualization window.

- **Image Processing Dialog:** This dialog window is to apply selected filters to selected images and construct filter and hue bubble spaces and descriptors.



Set Path: To set the path for RGB images.

Load Image: To load the image and show in the original image window. When pressed, a dialog box will be opened to select the RGB image.

Load Filter: To load the filter by selecting its location in opened dialog box. When the filter is selected, in a new window the selected filter will be shown.

Apply Filter: To apply the selected filter to the loaded image. After applying the filter, the resulting image will be shown in processed image window.

Sat Upper, Sat Lower, Val Upper, Val Lower: To specify the upper and lower values of the saturation and value of the selected images. By default they are 30 and 230 respectively.

File Names, Filter Names: To select more than one image and filter to construct bubble space and descriptors.

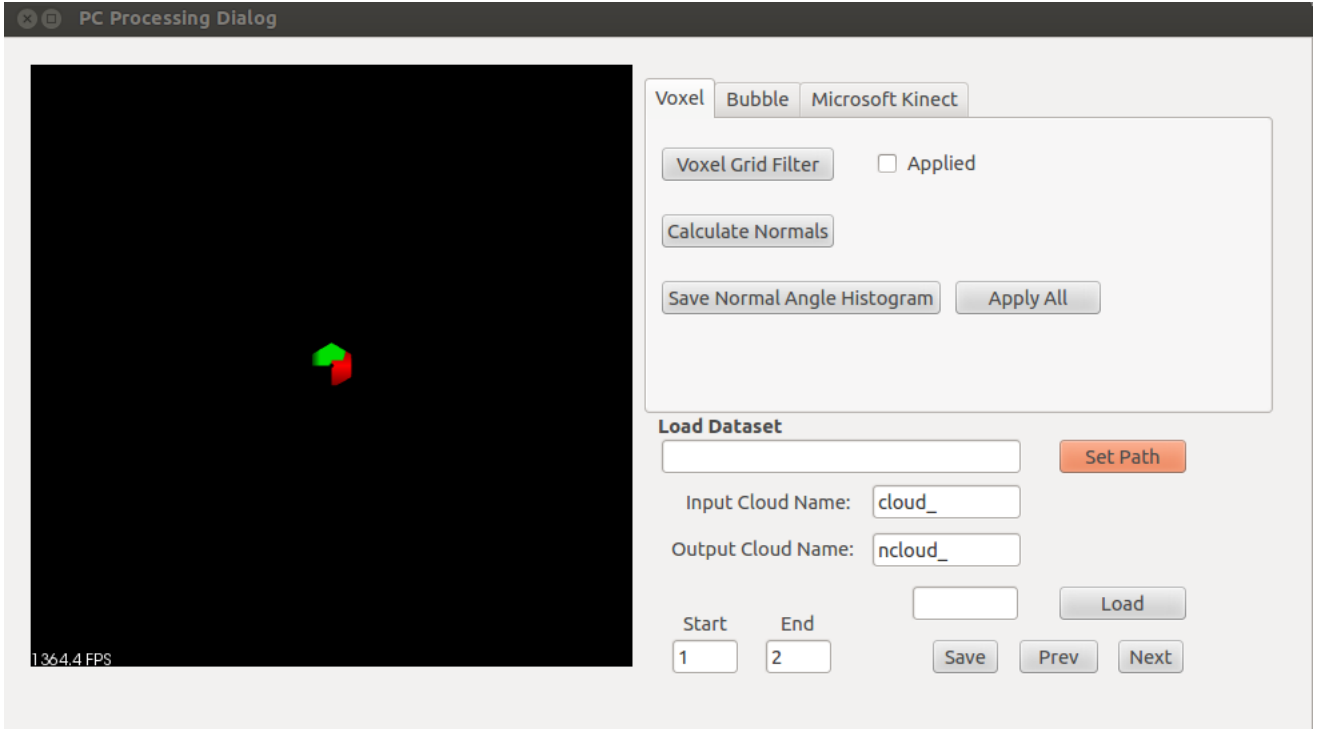
Apply All: If the filter is checked, the selected filters are applied to the selected images(selected by File Names and Filter Names) and after that, according to the selection (bubble,bubble stats or invariants), construct bubbles, bubble statistics or bubble invariants and write to the database. If hue is selected, hue bubbles, bubble stats or bubble invariants are constructed.

If omni is checked, it is necessary to enter the number of images used to construct the panoramic image and the angle offset between the consecutive images. After Apply

All is pressed, the bubble invariants, bubbles or bubble statistics will be calculated and the results will be written to the database.

By default the harmonics number is 10, but it can be changed as desired.

- **PC Processing Dialog:** This dialog box is to apply transformations on point cloud images and construct bubbles, bubble statistics and bubble invariants from them.



Set Path: To set the path of the location where all point cloud images are located. After this button is selected, all pcd files named starting with "cloud_" will be loaded.

Load: To load and show the selected cloud image. Attention: If the cloud image is named as for example cloud.001.pcd, load button will search for cloud_1.pcd file and it won't find it.

Prev, Next: To load the cloud files named one before the loaded image and after the loaded image and show them in the window.

Save: To save the point cloud image.

Start,End: To select the range of the cloud images to apply transformations.

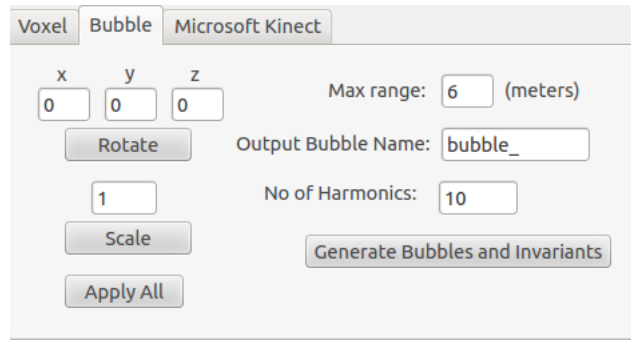
– **Voxel Tab:**

Voxel Grid Filter: To apply the voxel grid filter to the cloud image from the Kinect

Calculate Normals: Calculate and show the normals of cloud image from the Kinect

Save Normal Angle Histogram: Save the normal angle histogram

– **Bubble Tab:**



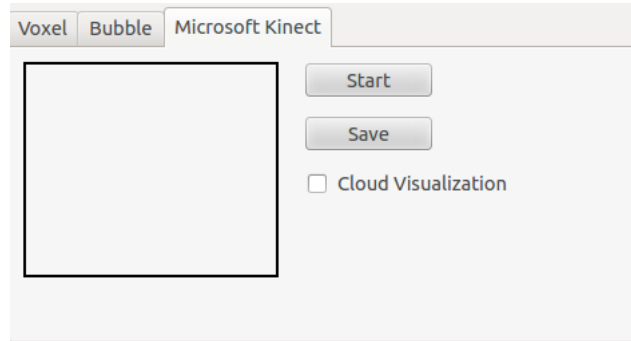
Rotate: To rotate and show the current cloud image by the angles specified by x,y,z texts in degrees.

Scale: To scale the point cloud with specified scale value.

Apply All: To apply rotations and scale to all cloud images loaded and save them as output cloud name (ncloud_).

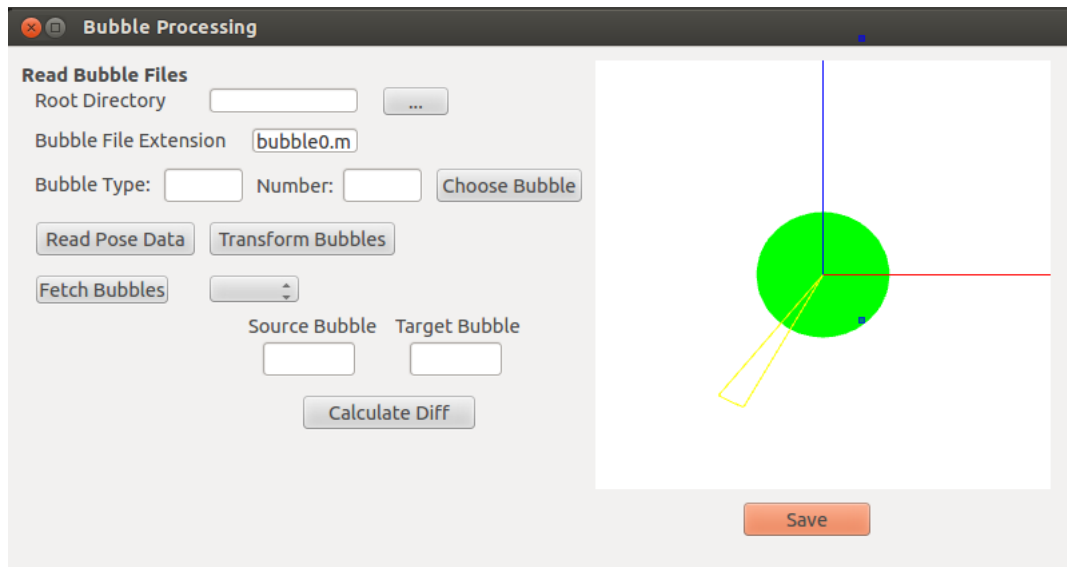
Calculate Bubble and Invariants: To calculate bubbles, bubble statistics and bubble invariants to selected cloud files in an opened dialog box. The name of the bubbles, maximum range of the camera and the number of harmonics can be specified.

– **Microsoft Kinect Tab:**



Start, Save: To start the Kinect camera and save the current RGB and point cloud image.

- This window is to visualize the bubble spaces constructed and saved in the database file.



Choose Bubble: To visualize the selected bubble in the database.

Bubble Type: The number of the filter that the corresponding bubble space is desired to be visualized. (For cloud bubbles this number is 55 and for hue bubbles this number is 56).

Bubble Number: The number of the bubble that is desired to be visualized.

Read Pose Data: To read pose data from the file.

Fetch Bubbles: To fetch bubbles from root directory.

Calculate Diff: To calculate Euclidean difference between source and target bubble.

Save: To save the image of the bubble space.