Human Reconstruction using RGBD Sensors and KinectFusion (KinFu)

The popularization of RGBD Sensors such as Kinect, Asus XtionPro Live, and Intel Realsense has accelerated the development of a huge number of applications in the field of image processing and computer vision. The process of 3D reconstruction of real surfaces has been improved by the development of KinectFusion and its open source version KinFu. KinFu enables the on-line reconstruction of scenes using any OpenNI compatible sensor such as Kinect and Asus XtionPro Live. Furthermore, KinFu has also the ability to perform such reconstructions off-line, given an input set of point clouds. The 3D reconstruction is not only applicable to inanimate objects but also to humans, therefore the reconstruction of the upper part of the human body (head and shoulders) is possible to perform with KinFu.

The goal of this bachelor thesis is to perform a study about the percentage of the point cloud that should be overlapped with the next point cloud in order to apply the off-line Kinfu process with satisfactory results using a human model, this includes the resolution of possible bugs presented in the code. Additionally, the study should be used together with new experiments to determine the optimal velocity of rotation required in the reconstruction of the upper part of the human body using the on-line Kinfu process.

Requirements:

- Knowledge in image processing
- C++ programming under Linux

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