Abstract
In this paper is presented a method to surface segmentation from sampled points, without a previous surface approximation, like triangular mesh or local polynomial regression. The segmentation process proceed from the information given by the data points, by this reason are necessary use algorithms, that estimates geometric properties like normals, curvatures and detection of surface discontinuities without its approximations. This paper presents a method to estimate the normals to each point in the surface, taking in account the local be adaptive and change the size depend on the local characteristics, the method is robust to noise and outliers. Additionally we presents a method to estimate principal curvatures and directions from sampled points; it is fundaments in the normal estimation and the conformation of the local geodesic neighborhood. Commonly, the data points sampled from surfaces are contaminated with noise produced by devices during the acquisition process. This paper propose a method to remove the noise in the data points, whereas preserving sharp features on the original surface model, the method prevent the data shrinkage produced by the average of the neighbors around the one point, the proposed method shown be robust to outliers.

Keywords
Surface Segmentation, Range Images, Point Clouds, Normal and Curvature Estimation, Discontinuity Detection, Noise Reduction, PCA.