The evaluation of shape distribution for object recognition based on kinect-like depth image

Abstract:

Shape distribution is a common 3D shape descriptor that has been widely used for 3D object retrieval. In this study, we evaluate the feasibility of shape distribution for object recognition based on Kinect-like depth image obtained from RGB-D object dataset; consisting of several household instances from 51 classes; and each instance consists of depth images from different rotational angle view. The proposed evaluation procedures are called (1) inter-class evaluation and (2) intra-class evaluation and were used to evaluate the shape distribution performance. Based on these evaluations, shape distribution performance was found to be slightly decreased in inter-class manner while significantly decreased for intra-class. It is evident that the minimal performance degradation in inter-class evaluation is due to variety of formed shapes when the instance is rotated while shape distribution suffers from not only shape variation among different rotational angle view but also among different instance per class in intra-class evaluation. This preliminary attempt shows that shape distribution is a relevant candidate applicable in object recognition for Kinect-like depth image.