Global Based Histogram for 3D Object Recognition

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Abstract : In this work, we address the problem of 3D object recognition with depth sensors such as Kinect or Structure sensor. Compared with traditional approaches based on local descriptors, which depends on local information around the object key points, we propose a global features based descriptor. Proposed descriptor, which we name as Differential Histogram of Normal Vectors (DHONV), is designed particularly to capture the surface geometric characteristics of the 3D objects represented by depth images. We describe the 3D surface of an object in each frame using a 2D spatial histogram capturing the normalized distribution of differential angles of the surface normal vectors. The object recognition experiments on the benchmark RGB-D object dataset and a self-collected dataset show that our proposed descriptor outperforms two others descriptors based on spin-images and histogram of normal vectors with linear-SVM classifier.

Keywords : vision in control, robotics, histogram, differential histogram of normal vectors
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