

Object Detection Based on Plane Segmentation and Features Matching for a Service Robot

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Abstract : With the aging of the world population and the continuous growth in technology, service robots are more and more explored nowadays as alternatives to healthcare givers or personal assistants for the elderly or disabled people. Any service robot should be capable of interacting with the human companion, receive commands, navigate through the environment, either known or unknown, and recognize objects. This paper proposes an approach for object recognition based on the use of depth information and color images for a service robot. We present a study on two of the most used methods for object detection, where 3D data is used to detect the position of objects to classify that are found on horizontal surfaces. Since most of the objects of interest accessible for service robots are on these surfaces, the proposed 3D segmentation reduces the processing time and simplifies the scene for object recognition. The first approach for object recognition is based on color histograms, while the second is based on the use of the SIFT and SURF feature descriptors. We present comparative experimental results obtained with a real service robot.

Keywords : object detection, feature, descriptors, SIFT, SURF, depth images, service robots

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