Designing A Hybrid Sensor System For A Housekeeping Robot

Abstract

Housekeeping robots are service robots specially designed to perform housekeeping tasks such as cleaning and vacuuming, our research focuses on the design of a housekeeping robot to pick up waste objects in a home or office environment. In this paper a hybrid sensor system for the house keeping robot is proposed using vision and ultrasonic sensors to navigate around obstacles and to pick up objects. To pickup objects, ascertaining the exact location of the object is of prime importance. This can be accomplished by computing the 3D coordinates of the object. The navigation task for robots involves the detection of obstacles or objects in the traversable path. Images of objects and obstacles are captured using vision sensors, segmented from background and processed to extract features which are fed to a neural network to recognize and differentiate between obstacles and objects. A recognition accuracy of 100% with an error tolerance of 0.001 is achieved. The centroid of the segmented object is computed to give the x, y and z coordinates of the object location.