

Development of monocular vision system for depth estimation in mobile robot -robot soccer

Abstract

Vision system could enhance the mobile robot applications and features. However, the vision system could also improve the overall system of mobile robot so as to contain higher complexity with the purpose to be reliable, effective, robust and fast enough to achieve their goals. This paper will present a simple yet reliable monocular vision system in the mobile robot to increase their capabilities in depth estimation. By comparing few methods for circle detection such as Hough Transform (HT), Fast-Finding-and-Fitting (FFF) and background subtraction algorithm, the object of interest can be detected thus diameter will be calculated and finally estimated depth is obtained. This paper also will show the trick on how to solve the depth estimation if the object being too close to the camera. The relationship between distance and diameter is calculated by formula that is derived from calibration data.

Keywords — Background subtraction, diameter, distance, Fast-Finding-and-Fitting, Hough transform, mobile robot