

DEVELOPMENT OF AUTO-TRACKING MOBILE ROBOT

Suresh A/L Sundarajoo, Ahmad Shahrizan Bin Abdul Ghani*

Faculty of Manufacturing Engineering, Universiti Malaysia Pahang,
26600 Pekan, Pahang, Malaysia. E-mail: shahrizan@ump.edu.my*

Abstract

Auto tracking mobile robot is a device that able to detect and track a target. For an auto tracking device, the most crucial part of the system is the object identification and tracking of the moving targets. In order to improve the accuracy of identification of object in different illumination and background conditions, the implementation of HSI color model is used in image processing algorithm. In this project HSI-based color filtering algorithm were used for object identification. This is because HSI parameter are more stable in different light and background conditions, so it is selected as the main parameters of this system. Pixy CMUcam5 is used as the vision sensor while Arduino Uno as the main microcontroller that controls all the input and output of the device. Besides that, L293D is used as the motor driver to control the movement of two DC motors that attached to the wheel of the robot. Moreover, two servo motors were used to control the pan-tilt movement of the vision sensor. Experimental results demonstrate that when HSI colorbased filtering algorithm is applied to visual tracking it improves the accuracy and stability of tracking under the condition of varying brightness, or even in the low-lightlevel environment. Besides that, this algorithm also prevents tracking loss due to object color appears in the background.

Keywords - *HSI colour-based filtering; PixyCMUcam5; mobile robot; color tracking.*