

ABSTRACT

The camera is one of the sensors of the robot that identifies the environment through the vision system that can provide information on the environmental condition of an image. The camera is very sensitive to environmental factors change often, so it is necessary to study the factors that affect the performance of the camera and setting the ideal combination of environmental factors to minimize the error rate in identifying image on color segmentation process. To resolve the problem required the design phase of the experiment with the Taguchi approach using the HSV color detection in image processing. Advantages of the Taguchi method is able to minimize the impact of the variation of the response as well as the experiments can be done efficiently. While the detection of HSV color has a dimension of color that is quite varied. Data analysis is done based on the characteristics of the "smaller is better" from the Signal to Noise Ratio (S / N) with the normality test and analysis of variance (ANOVA). Results of analysis of S / N ratio on red pallet optimal combination of factors resize at high level (120%) with value of S / N ratio is 13.774, camera resolution at medium level (2MP) with value of S / N ratio is 12.475, distance camera at low level (12 cm) with value of S / N ratio is 13.572 and contrast at high level (1.7) with value of S / N ratio is 2.785. As for the combination of optimal factors of yellow pallet that is factor resize at low level (80%) with value of S / N ratio is 12.679, resolution of the camera at high level (8 MP) with value of S / N ratio is 11.478, distance of the camera at low level (12cm) with value of S / N ratio is 10.921 and contrast at high level (contrast = 1.7) with value of S / N ratio is 2.443. Combination of optimal factors to identification of colors in blue pallet for resize at high level (120%) with value of S / N ratio is 13.640, camera resolution at medium level (2MP) with value is S / N ratio is 14.441, distance camera at low level (12cm) with value of S / N ratio is 13.495 and contrast at high level (1.7) with value of S / N ratio is 2.683.

Keywords: Image processing, color segmentation, HSV, design of experiment, Taguchi