

ABSTRACT

Indonesia is a maritime country with considerable marine tourism potential, encouraging automation innovation in shipping navigation system technology. There are various technologies and methods for this navigation automation system between better efficiency, among others, using the method of environmental recognition systems on the sea surface or ASV.

In this Final Project, a RC Boat model equipped with an automatic navigation system using HSV technology is designed and realized, namely using a color detection method (through a camera) using green and red balloons on the water surface for direction control (left/right turn) and obstacle detection. The detection data is transferred from the Raspberry Pi (on the Boat) to the laptop (on land) via Wi-Fi with a frequency of 2.4 GHz. As a comparison to the automatic navigation control system, a manual navigation system (RC Boat) is also carried out from land for direction and speed control.

The RC Boat design results show good performance in both autonomous and manual modes. Despite the delay in image processing, Wireshark analysis provides insights for network optimization. Accuracy test results for both automatic and manual systems show 100% compliance. While the average delay for the automatic system manual system is 9.19297 ms.

Keywords: ASV, HSV, OpenCV, Wi-Fi, Delay, Image Processing