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Design and Implementation of an Unmanned Ground Vehicle using Arduino

Aeyman Hassan^{1*}, Imane Ouahmane², Sayef Edden Hlila³

Department of Computer Engineering, Faculty of Engineering, University of Zawia, Libya¹

Department of Electrical Engineering, Faculty of Engineering, University of Zawia, Libya^{2, 3}

a.hassan@zu.edu.ly, Zeng94emy@gmail.com, 3eng94saif@gmail.com¹

ABSTRACT

This paper presents design and implementation of an unmanned ground vehicle (UGV) with low-cost components. This vehicle can be controlled in two ways, manually using global system for mobile (GSM) or autonomously; where It is able to follow specific waypoints, which given by the user. The main brain of the proposed system is Arduino platform, and the navigation of the UGV was designed by utilizing the advantages of global position system (GPS) and digital compass. Furthermore, the guidance of the proposed vehicle was performed using closed-loop control programmed in C language and executed in the main control board. As a result, it controls the steering angle of the UGV through servo motor. In addition, by including Bluetooth shield, the vehicle can be guided using a mobile application as well. The experimental results demonstrate high efficiency of the UGV in the predefined mission.

Keywords: unmanned ground vehicle, global system for mobile, navigation, guidance