Design & development of a slave robot for performing domestic applications

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Abstract
In this paper, we present the development of an automated robot which could be used for a host of interactive applications. This paper provides a comprehensive account of the design and development of the "DASYAM" robot, which is primarily used for interactive applications. The demand for intelligent service robots is now being met through research and development efforts. These applications include everything from entertainment to health care. These service robots require direct connection with their human users in order to perform their service activities and are designed for non-expert people to operate. Therefore, such service robots are typically preferred to have interaction elements that are friendly to humans. New robotic application fields have been made possible by recent advancements in intelligent service robotics, including healthcare, rehabilitation, childcare, assistance, education, and entertainment. The review's findings—possible improvements—have been offered after a thorough investigation and analysis of the available literature to determine the shortcomings of the current methodologies. The work presented here is the mini-project work of the 2nd sem students of electronics & communication engineering department of dayananda sagar college of engg., bangalore.
Keywords—Robot, Interaction, Design, Application

1. Introduction
A brief introduction about the related work that is being in this introductory note. The study of self-serviced robots provides a thorough account of the design and development of the "DASYAM" robot, which is mostly used for interactive applications. The demand for intelligent service robots is now being met through research and development efforts. These applications include everything from entertainment to health care [15]. These service robots require direct connection with their human users in order to perform their service activities and are designed for non-expert people to operate. Therefore, such service robots are typically preferred to have interaction elements that are friendly to humans [14]. Fig. 1 gives a photographic view of the ultrasonic sensor system developed by the mini project team [2].

It is projected that the intelligent service robots deployed in these new fields of robotic applications will interact with humans directly in household settings, with the majority of users falling into the non-expert category. Therefore, to provide advanced service, human-friendly interactions between these service robots and their human customers are preferred. The review of service robots and systems that can handle specific information in wi-fi control instructions is presented in this paper. The review's findings—possible improvements—have been offered after a thorough investigation

and analysis of the available literature to determine the shortcomings of the current methodologies [1].

Fig. 1 : Photographic view of the ultrasonic sensor system developed

2. Service Robots Design

One kind of robot that is frequently utilised outside of industrial settings is the service robot. Frontline service is increasingly using robots, according to service groups. A service robot can interact with people in addition to having technology features for services. Along with improvements in artificial intelligence, speech recognition, sensors, computer vision, and other fields, service robot technology has been growing quickly. Fig. 2 gives the block diagram of the robot designed using Node MCU, batteries & gears. Robots are becoming smarter, more mobile, and less expensive for a wider range of services that are frequently performed in dynamic environments and require the ability to navigate through populated and occasionally restricted areas thanks to advancements in sensors, navigational systems, and machine learning [3].
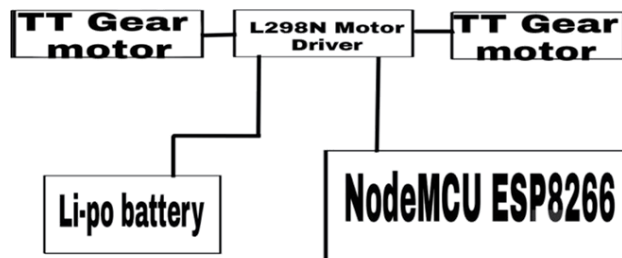

Fig. 2 : Block diagram of the robot designed using Node MCU, batteries & gears.

Service robots, for instance, are ones that "perform helpful tasks for humans or equipment, excluding industrial automation applications," according to the International Federation of Robotics [4][12]. Military personnel frequently operate in hazardous environments and support medical treatments. Fig. 3 gives the circuit diagram of the designed robot. A human user's total interaction with his or her robot partner will be improved by the viability of wi-fi robot and human-robot interactions, which will ultimately lead to an increase in user [6]. The Fig. 4 gives the eight (8) possible motions of the robot controlled using remote key.
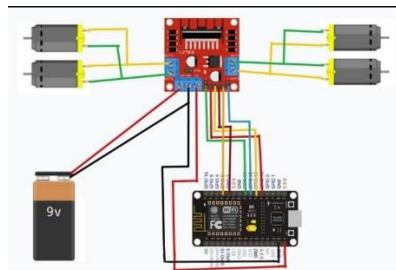

Fig. 2 : Circuit diagram of the designed robot

3. APPROVED PROPOSED METHODOLOGIES

The following methods was used to create "DASYAM MOBOT". There are 8 steps involved in the design process of the robot, which are explained in 8 steps as follows [11] as 8 steps shown in the Fig. 3.
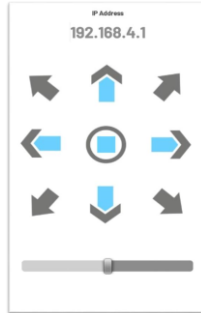
Fig. 3 : Eight possible motions of the robot controlled using remote key

4. Tools used
In this section, the tools that are used are presented in a nutshell. The following are the tools that were used: NodeMCU ESP8266, TT Gear Motor, L298N Motor Driver, Jumper wires, 6V Battery, and Wheels. The table 1 gives the 8 points used as inputs to the controller boards. Figs 6 & 7 gives the photographic view of the top of the robot on which the components are housed along with the designed & developed DASYAM service robot in the lab.

5. Findings and Discussions
Service robots are more efficient and less expensive. Additionally, it speeds things up so that work can be done quickly [17]. The service sector started introducing robots to carry out a range of tasks as a result of the quick advancements in technology, particularly in artificial intelligence, smart sensors, big data analytics, and robotics. A service robot is a robot that, with the exception of industrial automation applications, performs beneficial tasks for people or other equipment. They are not easily distracted and do not require breaks [8].
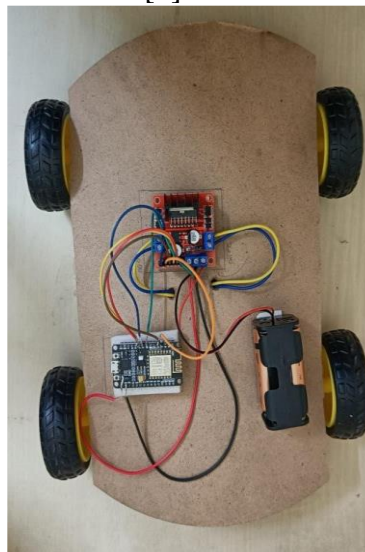

Fig. 3 : Photographic view of the top of the robot on which the components are housed

Tasks are completed flawlessly. Humans no longer need to perform hazardous jobs because robots can work in those conditions. They are capable of handling repetitious jobs, dangerous materials, and heavy lifting. This has helped businesses avoid numerous mishaps while also saving them money and time [9].

6. Conclusion and next work
The possibility of personal service robots working from homes is expanding quickly. According to consulting firm Frost & Sullivan, one million service feet were in operation in 2019 and the market for personal robots is expected to reach $519 billion in opportunity by 2020. The worldwide Federation of Robotics (FIR) anticipates a 20–25% increase in services robot sales by 2020 [10].

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