Design and Construction of a Disinfection Robot Model for Application in Healthcare

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***Abstract*—This thesis presents the design and construction of a disinfection robot model for use in healthcare settings. The project involved the design of a software interface for mobile devices, the development of a block diagram, and the construction of a prototype. The robot uses an Arduino Uno R3 microcontroller, Bluetooth module HC06, L298N module, pressure pump, battery, and DC motors. The arm of the robot, equipped with spray nozzles, can rotate up to 180 degrees, intended to improve spray coverage. The system operates in both automatic and manual modes, with a mobile application interface for quick and stable response. The prototype meets the initial objectives of the project, demonstrating stable operation and the ability to control the robot through both modes. However, the automatic corridor disinfection mode has some directional control issues, and the user can switch to manual mode to correct the direction and avoid obstacles.**

***Index Terms*—disinfection robot, Arduino, Bluetooth, mobile application, healthcare**

I. Introduction

The thesis focuses on the design and construction of a disinfection robot model for use in healthcare settings. The project aims to reduce the spread of viruses in quarantine areas and public healthcare environments. The robot is designed to operate in both automatic and manual modes, with a mobile application interface for control. The design addresses the need for efficient and safe disinfection methods in healthcare, particularly during the ongoing pandemic. The project aims to optimize the robot's functions and accuracy for future applications in science and military fields [1].

II. Methods

The methods involved designing a software interface for mobile devices, developing a block diagram, and constructing a prototype. The robot uses an Arduino Uno R3 microcontroller, Bluetooth module HC06, L298N module, pressure pump, battery, and DC motors. The arm of the robot, equipped with spray nozzles, can rotate up to 180 degrees, intended to improve spray coverage. The system operates in both automatic and manual modes, with a mobile application interface for quick and stable response. The prototype was tested in a controlled environment to ensure its functionality and stability [1].

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III. Results

The prototype meets the initial objectives of the project, demonstrating stable operation and the ability to control the robot through both modes. The system operates in both automatic and manual modes, with a mobile application interface for quick and stable response. The robot's arm can rotate up to 180 degrees, intended to improve spray coverage, and the pressure pump ensures efficient disinfection. However, the automatic corridor disinfection mode has some directional control issues, and the user can switch to manual mode to correct the direction and avoid obstacles. The prototype was tested in a controlled environment, and the results showed that the robot could effectively cover the designated area, but there were some limitations in the automatic mode [1].

IV. Discussion

The prototype shows stable operation and the ability to control the robot through both automatic and manual modes. However, there are some limitations, such as the automatic corridor disinfection mode having some directional control issues. The user can switch to manual mode to correct the direction and avoid obstacles. The project aims to optimize the robot's functions and accuracy for future applications in science and military fields. The limitations suggest that further improvements are needed to enhance the robot's autonomy and reliability in real-world scenarios [1].

V. Conclusion

The project successfully designed and constructed a disinfection robot model for healthcare applications. The system operates in both automatic and manual modes, with a mobile application interface for quick and stable response. The prototype demonstrates stable operation and the ability to control the robot through both modes. However, there are some limitations, and the project aims to optimize the robot's functions and accuracy for future applications in science and military fields. The prototype's performance in a controlled environment indicates its potential for practical use, but further development is necessary to address the identified limitations [1].

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