ABSTRACT

Cars have become an essential necessity in society, and with the availability of affordable private vehicles, their interest in owning a car is increasing. However, the increasing use of cars also creates increasingly complex parking issues, primarily due to the lack of information about available parking spaces. To address this problem, an efficient parking allocation system and guidance are needed, which can provide information about the availability of parking spaces and assist drivers in quickly and accurately finding suitable parking spots. This research aims to create a miniature smart parking system that utilizes Internet of Things (IoT) technology and website-based microcontrollers to automatically manage parking systems and provide information on parking space availability to users. The study successfully created a miniature car parking allocation system using ultrasonic and infrared sensors, which has functioned well. Test results show a 100% detection accuracy rate for vehicle presence. The average delay from the moment a car enters a parking slot until information appears on the user's website is 2.51, while the average delay from the moment a car leaves a parking slot until information appears on the user's website is 1.48. For further development, it is recommended that the system be equipped with directional guidance features and that the miniature parking layout be adjusted to match real parking areas.

Keywords: Smart parking system, Internet of Things (IoT), microcontroller, website