

# **A New Parking-Space Detection System Using Prototyping Devices and Bluetooth Low Energy Communication**

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## **Abstract**

Parking in crowded city areas usually causes serious problems. Drivers spend an amount of time, effort, and fuel while finding someplace to park their vehicles. Although there are many solutions for free parking space indication; they are only suitable for parking lots inside the buildings, such as the shopping malls. However, there are not many solutions for exterior parking lots and for big cities as a whole. The purpose of this paper is to propose solutions to this problem, especially by considering issues like power consumption and communication approaches. A parking-space occupancy detection system is proposed, utilizing Bluetooth Low Energy communication and Arduino-based sensor devices. Raspberry Pi-based central devices redirect the collected data to the cloud-based database system, which makes them available for drivers to use mobile devices with Android systems. The selected components make the proposed system easily deployable and scalable.

**Keywords:** bluetooth, low energy, embedded system, internet of things, parking system

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