

## A Car Parking Monitoring System Using a Line-Topology Wireless Sensor Network

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**Abstract :** This paper presents a car parking monitoring system using a wireless sensor network. The presented sensor network has a line-shaped topology and adopts a TDMA-based protocol for allowing multi-hop communications. Sensor nodes are deployed in the ground of an outdoor parking lot in such a way that a sensor node monitors a parking space. Each sensor node detects the availability of the associated parking space and transmits the detection result to a sink node via intermediate sensor nodes existing between the source sensor node and the sink node. We evaluate the feasibility of the presented sensor network and the TDMA-based communication protocol through experiments using 11 sensor nodes deployed in a real parking lot. The result shows that the presented car parking monitoring system is robust to changes in the communication environments and efficient for monitoring parking spaces of outdoor parking lots.

**Keywords :** multi-hop communication, parking monitoring system, TDMA, wireless sensor network

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