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## Intelligent Detector Provides Real-Time Information on Available Parking Spaces

*Researchers in Spain have designed an intelligent detector designed to provide real-time information on available parking spaces.*

Testing of the new technology is currently underway at the Universitat Politècnica de Catalunya's North Campus, and a patent is being sought. The system can be used to provide users with information via mobile devices such as phones, laptop computers, and iPads, or using luminous panels in public thoroughfares. In the coming months it will be installed in the 22@Barcelona innovation district and in downtown Figueres.



Testing of the new technology is currently underway at the UPC's North Campus. It is a combination of an optical and a magnetic sensor. Continuous operation with low power consumption. (Credit: Image courtesy of Universitat Politècnica de Catalunya)

A team at the Department of Electronic Engineering of the Castelldefels School of Telecommunications and Aerospace Engineering (EETAC), part of the Universitat Politècnica de Catalunya (UPC), has designed a new method for continuously detecting the presence of vehicles using both an optical and a magnetic sensor. The detector incorporates the two sensors in a 4 by 13 cm casing that is set into the pavement of each parking space. Urbiotica, a company set up by UPC professors and their industrial partners, is testing the system at the UPC's North Campus prior to placing it on the market.

The device works by first detecting the sudden change in the amount of light reaching the pavement that occurs when a vehicle passes over it. The optical sensor then activates the magnetic sensor to verify that the shadow is being produced by a vehicle. This is done by detecting the slight disturbance in Earth's magnetic field that occurs when a car passes over or stops above the device. The two sensors are connected to a microcontroller that executes

an algorithm to determine whether or not a vehicle is present. The system's optical sensor is always active but consumes an insignificant amount of power.

When a vehicle is detected, the microcontroller sends a radio-frequency signal, which conveys this information to an antenna connected to a transceiver. This way of transmitting signals is much more economical than using wiring. The transceiver, designed for installation on street lights, receives the

information and transmits it to the database or control center within seconds (using technologies such as Wi-Fi or GPRS). Potential clients for the system include municipal services and parking lot operators.

According to Ramon Pallàs, head of the UPC team that developed the technology (for which a patent is being sought), the plan is to make the information available on luminous panels on public thoroughfares. Users will also be able to receive parking information on mobile devices such as phones, laptop computers, and iPads.

The innovative features of the product (which the UPC's AntenaLAB group also worked on) relate to the field of sensors, the circuits connecting the sensors to the microcontroller, the method for supplying power to the sensors, and management of the power supply for the system as a whole.