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Solar-Powered Smart City Automobile Recognition System (SmartCARS™)

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Synopsis

This research presents a Smart City Automobile Recognition System (SmartCARS™) that leverage on Radio Frequency Identification (RFID) Technology which comprises of two main intelligent sub units namely the RFID Reader unit and the RFID Tag unit. The monitoring area or city is segmented into cells and multiple solar powered UHF RFID readers are installed to monitor and record automobile movement. Information are wirelessly transmitted to the cell database centre and all cells report to a central database of city under consideration. The user interface will monitor the movement of the specified automobile. All data will be logged using MySQL database management system (DBMS), which is versatile open-source software. The Java application will communicate with the DBMS using MySQL. The system presented herein serves as a prototype.

We leverage on the use of Radio Frequency Identification (RFID) technology to achieve citywide automobile detection and town planning system in an inexpensive, reliable, flexible, and scalable manner. We outline the challenges that can affect RFID automobile detection, and propose practical mitigating solutions. We presented several new algorithms for RFID-based object detection that compare favourably with other methods in terms of accuracy, speed, reliability, scalability, and cost.

Benefits

- Simple implementation in comparison with similar deployments
- Less cost-intensive than systems built on other technologies
- Configurable to serve as automated access control system
- Can serve as a tool for smart planning in the Local Government
- Can be used to calculate the Annual Average Daily Traffic (AADT) which is a common indicator of traffic volume
- Developed primarily as a n automobile real-time locating device with attendant benefits for security management and asset control

Conclusion

- It has been stated that several of the more established location determination technologies (e.g. GPS, RADAR etc) are complex to setup and also more expensive to deploy.
- Therefore, there is a need for the nations in Africa to deploy simple and cost effective technique.
- On the other hand, we also observed that automobile theft and traffic congestions is on the increase and this can be curbed if the approximate location of the automobile can be determined per time. In an attempt to find a low-cost and effective solution, the use of RFID can be employed.
- **Patent Pending**



Figure 1. SmartCARS™ Installation



Figure 2. Re-engineered UHF Antenna with LCD Interface & Wireless Antenna