

**A Predictive Model to Reduce Energy Consumption
in Object Tracking Sensor Network Applications**

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Abstract

Due to the rapid growth of the Internet of Things, the World we interact with is becoming more and more automated. Different kinds of sensors are nowadays available easily and a low cost, and this led to the idea of a system composed of a collection of sensors interconnected with each other, usually known as Wireless Sensor Network (WSN).

Among the many applications covered by the use of WSNs, Object Tracking Sensor Network (OTSN) appears to be the most attracting. It refers to the ability of the sensor nodes to detect, monitor, and track one or more Mobile Objects (MOs). However, one of the main challenges of a WSN is its energy consuming management, which seems to play a vital role for the overall performance of the WSN itself.

In this work, the energy saving issue in an OTSN application is addressed by introducing a methodology which aims to mitigate the overall consumption of energy in relation to an OTSN application. This strategy makes use of a Machine Learning technique in order to predict future behaviours of a MO moving into a monitored region. Moreover, a simulator capable of reproducing the main features of a real MO in an OTSN application is developed. Eventually, several experiments have been carried out to evaluate performance and reliability of the proposed methodology in terms of predictions accuracy and energy saved.

