

Accepted Manuscript

Intelligent system for lighting control in smart cities

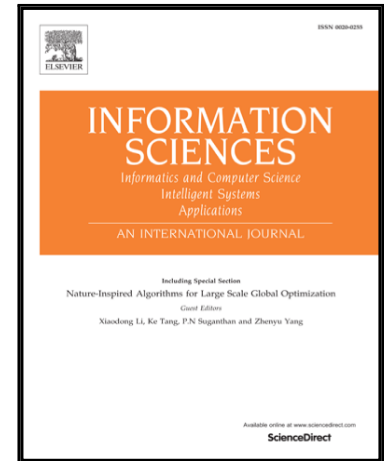
Juan F. De Paz , Javier Bajo , Sara Rodríguez ,
Gabriel Villarrubia , Juan M. Corchado

PII: S0020-0255(16)30611-9
DOI: [10.1016/j.ins.2016.08.045](https://doi.org/10.1016/j.ins.2016.08.045)
Reference: INS 12448

To appear in: *Information Sciences*

Received date: 18 October 2015
Revised date: 31 July 2016
Accepted date: 14 August 2016

Please cite this article as: Juan F. De Paz , Javier Bajo , Sara Rodríguez , Gabriel Villarrubia , Juan M. Corchado , Intelligent system for lighting control in smart cities, *Information Sciences* (2016), doi: [10.1016/j.ins.2016.08.045](https://doi.org/10.1016/j.ins.2016.08.045)



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Intelligent System for Lighting Control in Smart Cities

Juan F. De Paz, Javier Bajo, Sara Rodríguez, Gabriel Villarrubia and Juan M. Corchado

¹Computer and Automation Department. University of Salamanca. Spain

²Artificial Intelligence Department. Polytechnic University of Madrid. Spain

{fcofds, srg, gvg, corchado}@usal.es; jbajo@fi.upm.es

Abstract. This paper presents an adaptive architecture that centralizes the control of public lighting and intelligent management to economize lighting and maintain maximum visual comfort in illuminated areas. To carry out this management, the architecture merges various techniques of artificial intelligence (AI) and statistics such as artificial neural networks (ANN), multi-agent systems (MAS), EM algorithm, methods based on ANOVA, and a Service Oriented Approach (SOA). It achieves optimization in terms of both energy consumption and cost by using a modular architecture, and is fully adaptable to current lighting systems. The architecture was successfully tested and validated and continues to be in development.

Keywords: Light sensors, intelligent systems, distributed systems, Autonomous control, Street lighting

1 Introduction

The concept of Smart Cities is an increasingly common trend in technology-based projects. Balancing the environment and natural resources is a practical and responsible key for these paradigms, which aim to increase the comfort in the daily lives of citizens and institutions by applying sustainable development practices. One of the goals of the systems developed under the concept of Smart Cities is to apply new technologies to obtain sustainable economic development and provide better quality of life. We have used the system presented in this study to produce a distributed lighting system to facilitate the implementation of a new infrastructure in a city; in other words, we have developed a modular architecture that is fully adaptable to a city's existing lighting systems and, consequently, optimizes energy consumption and costs. The subject of energy efficiency is paramount not only to reduce energy costs, but also to promote environmental and economic sustainability.

Download English Version:

<https://daneshyari.com/en/article/4944766>

Download Persian Version:

<https://daneshyari.com/article/4944766>

[Daneshyari.com](https://daneshyari.com)