

IoT for energy efficient green highway lighting systems : challenges and issues

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ABSTRACT

The demand of highway lighting system is ubiquitous but its operation contributes to extensive financial cost and concerning environmental implications. For this reason, recent researches have investigated possible solutions to boost the efficiency of the existing lighting system. However, the ultimate guide for green energy enabled smart highway lighting system is still lacking in terms of quality and comprehensiveness. The purpose of this paper is to discuss divergent proceedings in the literature to establish procedures of designing and developing energy efficient green highway lighting system, taking into account performance and environmental impact perspectives. A complete taxonomy is presented to identify and organize the literature into several categories, including fundamental design principles with their advantages, disadvantages and research challenges. This paper also intends to give a possible framework to the readers to bridge the gaps among the existing studies. These findings are anticipated to inform researchers and policymaker on perceiving the benefits of the ameliorated energy efficiency in the highway lighting set-up. Furthermore, open issues identified in this paper will pave the way on achieving future highway lighting systems that are not only facilitating safe and seamless driving experience, but also energy-efficient for environmental sustainability.

KEYWORDS

Electricity consumption; Energy efficient; Green lighting system; Highway lighting; Internet of things; IoT; Smart street lighting system

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