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IntelliHome: An internet of things-based system for electrical energy saving in smart home environment

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Abstract

Despite there has been an increasing energy price due to factors such as supply, demand, government regulation, among others, users do not like to spend their time to analyze their power consumption and establish actions to save money. Hence, there is a need for smart solutions that help users to save energy at home in an easy way. The smart home concept is attracting the attention of both academia and industry to address this need. Nowadays, high volumes of data are available in the smart home context, facilitated by the growth of internet of things (IoT)-based devices and advanced sensing infrastructure. Therefore, it is necessary to automatically extract useful knowledge from this information to cost-effective use of energy at home. In this sense, this work presents IntelliHome, a smart-home system that aims to reduce electrical energy consumption at home. To this end, IntelliHome uses big data analytics technologies and Machine Learning and statistical techniques to provide users with a meaningful perspective of their electricity consumption habits aiming to actively involve them in the energy-saving process through real-time information and energy-saving recommendations. This work also discusses a case study and an evaluation aligned with the objectives of this work.