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Design and Implementation of Machine Learning Model for Short-Term Energy Forecasting in Smart Home Management System

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Abstract : The main aim of this paper is to handle the energy requirement in an efficient manner by merging the advanced digital communication and control technologies for smart grid applications. In order to reduce user home load during peak load hours, utility applies several incentives such as real-time pricing, time of use, demand response for residential customer through smart meter. However, this method provides inconvenience in the sense that user needs to respond manually to prices that vary in real time. To overcome these inconvenience, this paper proposes a convolutional neural network (CNN) with k-means clustering machine learning model which have ability to forecast energy requirement in short term, i.e., hour of the day or day of the week. By integrating our proposed technique with home energy management based on Bluetooth low energy provides predicted value to user for scheduling appliance in advanced. This paper describes detail about CNN configuration and k-means clustering algorithm for short-term energy forecasting.

Keywords : convolutional neural network, fuzzy logic, k-means clustering approach, smart home energy management
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