Abstract

Global energy consumption hikes and natural resource depletion calls for fine-grained energy consumption on necessity basis. Our work focuses on the implementation of the concept of Green Internet of Things (Green IoT); using Internet of Things based architecture to induce autonomous sleep cycles in publically shared everyday usage appliances such as water coolers, coffee maker machines, vending machines, information kiosks etc. that are very commonly located in places such as schools, colleges, offices, tourism spots, airports, railways stations etc. where saving energy is usually not thought of. The approach presented here uses this IoT-based architecture to have the appliance report its usage pattern. The objective is to obtain the future usage forecast of the appliance made on the basis of the current usage patterns using the Machine Learning Architecture comprising of a Machine Learning Algorithm. The predicted usage data is then used to induce autonomous sleep cycles in the water cooler, for it to function as efficiently as possible, with least energy consumption. A water cooler system prototype is implemented using controller boards and sensors forming the IoT Architecture; the real time usage readings obtained from the prototype are used for predicting the future usage
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using ARIMA Machine Learning Algorithm, implemented using Python; and this forecast is then used for controlling the operation of the water cooler system.

References


2. Daniela Ventura, Diego Casado-Mansilla, Juan Lopez-de-Armentia, Pablo Garaizar, Diego Loex-de-Ipina, and Vincenzo Catania, “Embedding intelligent eco-aware systems within everyday things to increase people’s energy awareness ”, Springer-Verlag Berlin Heidelberg, June 2015


5. Paraphrased:"Machine Learning and Pattern Recognition can be viewed as two facets of the same field"


10. ARIMA Machine Learning Algorithm –

11. HTTP vs. MQTT Protocols –


16. Dataset downloaded from UCI Machine Learning
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17. The magnitude value from the three axis readings
http://www.instructables.com/id/Accelerometer-Gyro-Tutorial

18. Compressor cycle rate per hour

19. Compressor cycle rate per hour
https://www.researchgate.net/post/What_is_the_compressor_cycle_rate_for_water_coolers

Index Terms

Computer Science  Information Sciences

Keywords

Internet of Things; Green IoT; Machine Learning; ARIMA; MQTT protocol; Energy Optimization-publically shared daily usage appliances.