

Mining Frequent Patterns and Associations from the Smart meters using Bayesian Networks

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ABSTRACT

In today's world migration of people from rural areas to urban areas is quite common. Health care services are one of the most challenging aspect that is must require to the people with abnormal health. Advancements in the technologies lead to build the smart homes, which contains various sensor or smart meter devices to automate the process of other electronic device. Additionally these smart meters can be able to capture the daily activities of the patients and also monitor the health conditions of the patients by mining the frequent patterns and association rules generated from the smart meters. In this work we proposed a model that is able to monitor the activities of the patients in home and can send the daily activities to the corresponding doctor. We can extract the frequent patterns and association rules from the log data and can predict the health conditions of the patients and can give the suggestions according to the prediction. Our work is divided in to three stages. Firstly, we used to record the daily activities of the patient using a specific time period at three regular intervals. Secondly we applied the frequent pattern growth for extracting the association rules from the log file. Finally, we applied k-means clustering for the input and applied Bayesian network model to predict the health behavior of the patient and precautions will be given accordingly.

Keywords – Bayesian networks, Cluster analysis, FP pattern, Human activity prediction.

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I. INTRODUCTION

The daily interaction of ubiquitous sensors and devices to connect physical and virtual things via a seamless network is known as Internet of things (IoT). To build a new process "anytime, anywhere any service for anybody", the IoT includes different heterogeneous techniques. There are some likelihood probabilities which are provided by IoT will make this possible to provide several applications related to it. From those, the smart home is highly developed research domain in smart automation systems with motive of improvement of users comfort and guarantee for their security and its condition at least costs of operation. As smart home is an automated environment it is able to monitor, detect and record everyday activities with the utilization of different sensors and communication technologies. The routine activities of users' create patterns that perform a crucial role in smart home environment. Those patterns are utilized in favor of recognizing users' activity which might be useful in the enhancement of smart home applications in terms of

efficiency and energy management, healthcare and security etc.

On the remote monitoring the identification of users' daily activities is done. It has applications in more domains like health care and daily care [1]. So research on domestic activity recognition is attaining high interest, particularly because of recent trends to move healthcare from hospitals to houses of patients and facilitate to live independently. Anyways, possible applications go far beyond healthcare. For instance, identifying daily life activities also helps to support home automation and energy savings in smart homes/buildings. Domestic activity recognition relies on creating an inference by information fusion from heterogeneous sensors and uncertainty relevance because of stochastic nature of human behavior and imperfect sensing equipment. To find a human activity in smart environment, various diverse sensors are included, ranged from number of sensors, sensors for measuring heartbeat, walking patterns, and environmental sensors. The sensor's choice and their placing for the identification of particular