PERFORMANCE ANALYSIS OF RESOURCE-AWARE FRAMEWORK ON LIGHT-WEIGHT FREQUENT ITEM ALGORITHM (LWF)

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ABSTRACT

Recently, Data Stream has become a trend of data communications. This trend is influenced by the ability of mobile devices to transfer data in a real-time fashion, known as data streams. The use of this technology is particularly implemented in Wireless Sensor Network (WSN). However, this approach has a critical problem because of the limitation of resources owned by wireless sensor devices. The resources consist of battery, memory and CPU. The transmission of each data captured to a dedicated server consumes the devices’ resources. Hence, the devices’ resources will drop rapidly. Because of the limitation of the resources possessed by the wireless sensor devices, the idea of suppressing the use of those resources arises in order to keep the devices working as long as possible. One of the technique to prevent the resources from being consumed rapidly is by transmitting only important data to the dedicated server. So, the data captured by the devices will be mined onboard, then the result of the mining will be sent to the dedicated server. This approach will reduce the consumption of the resources significantly.

This thesis aims to verify and analyze the effectiveness of LW-Class and LWF algorithms that by observing the available of resources, the number of data, classes and counter the constantly changing based on the available memory during certain period. This experiment used Iris and Vehicle data set and simulated on Java programming environment. The experiment shows that by applying Resource-Aware produced better data mining results and the memory and CPU utilization are more efficient. In addition, by implementing the resource-aware framework, the battery life time increases +30%. We also discovered that LWF has better memory utilization than LW-Class because LWF uses less memory than LWF. On the other hand, LWF-Class has better battery lifetime than LWF by +15%.

Keywords : Data Stream, Algorithm Granularity, Resource-Aware