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A Modified Approach for Personalized Knowledge Discovery Framework for Context Aware Assisted Healthcare

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ABSTRACT: Context-aware monitoring is an emerging technology that provides real-time personalized health-care services and a big data application.The system propose aknowledge discovery-based approach that allows the context aware system to its behavior in runtime by large amounts of data generated in ambient assisted living (AAL) systems and stored in cloud repositories. The proposed model facilitates analysis of big data. It first mine the trends and patterns in the data of single patient with associated probabilities and utilizes that knowledge to learn properab normal conditions. The result of this learning method are then applied in context-aware decision-making processes for the patient. It implemented to elaborate the applicability of the framework that discovers the knowledge of classification to identify the true abnormal conditions of patients having changes in Temperature, blood pressure (BP) and heart rate (HR).

KEYWORDS: Assisted Healthcare, Context-awareness, Knowledge Discovery, Data Mining, Association mining Algorithm

I. INTRODUCTION

Data Mining it is the process of identifying patterns in large sets of data. The aim is to uncover past unknown, useful knowledge. DM is applied to the facts generated by the information extraction phase. We have put the results of our DM process into another database that can be queries by the end user via a graphical interface. Information Extraction it is the process of automatically obtaining structured data from an unstructured natural language document. This involves defining the general form of the information that we are interested in as one or more than templates, which are then used to guide the extraction process. Systems identify the documents in a collection which match a user query. The most well known IR systems are search engines such as Google, which identify this document on the World Wide Web that are relevant to a set of given words. IR systems are obtained used in libraries, where the documents are typically not the books themselves but digital records containing information about the books. IR systems allow us to narrow down the set of documents that are relevant to a particular problem. As text-mining involves very computationally intensive algorithms to large document collections, IR can speed up the analysis considerably by reducing the number of documents for analysis. For example, if we are interested in mining information only about protein interactions, we might restrict our analysis to documents that contain the name of a protein, or some form of the verb to interact or one of its synonyms.

II. RELATED WORK

R. Agrawal and R. Srikant[2] has proposed the system in which Apriori hybrid algorithm is use for increase the transaction number and size in the database. It gives a frequent item set in transactional database as an output. It's an efficient algorithm for fining frequent items. It require Generate large number of candidate item set and Repeatedly scanning the transaction databases R. Rastogi and K. Shim [3] has proposed Pruning and graph search algorithm is used for Disjunction over uninstantiated attributes are permitted in association rule. Arbitrary number of uninstantiated attributes are allowe in association rules.These attributes can be either numeric or categorical. While decision trees classify easily, the time required for building a tree quite more than another type of classifier. Decision trees suffer from

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a problem of errors propagating throughout a tree. A very serious problem as the number of classes increases B.McGrath [4] was used Sphygmomanometer cuff to measure the blood pressure for every 15 to 30Minutes . In this paper Ambulatory Monitoring system is used. Automatic blood pressure readings obtained from portable monitors do not induce any alerting reaction or presser response in the patient. The assessment of 24hr blood pressure and heart rate variabilities is less accurate J. Dean and S.Ghemawat [5] was proposed application which is large cluster of Machine resource and fit large computational problems in the Google using map reduce. For this Map reduce technology is used. Mapreduce is the patented software framework given by Goggle in 2004. It is a programmable model and associated implementation for processing and generating large data sets parallel manner. Its computational is specified in terms map and reduce function. Map takes an input and gives output in form of key/value pairs and map-reduce function take one key/value pair and give a list of new key/value pairs as output. All map operations are does not dependent on each other and they are fully parallelized. For the datasets either have many short transactions with less frequent items or large database with larger transaction having many frequent items, proposed method has good performance. It is performance is good when large data intensive computation is required and ceases as data decreases.

III. IMPLEMENTATION DETAILS

A. Problem Definition:

The proposed system implement a knowledge discovery based approach which enables context-aware system to change the behavior at the runtime by analyzing data. Initially system mines the patterns and trends in the data of individual patient using its associated probabilities. Extracted knowledge then applied to learn the proper and abnormal conditions, which then used for the decision making process of patient. The model implement the semi-supervised approach for the learning the patient related conditions.

B. Proposed System:

1. Ambient Assisted Living(AAL)Systems

The big data producers of model are a large number of AAL systems. The low level setup of each system varies according to the requirements of the patient. The sensors, devices and software services of each AAL system produce raw data that contain low level information of a patient's health status, location, activities, surrounding ambient conditions, device status, etc.

2. Data Collector and Forwarder(DCF)

Traditional context-aware systems process the low level data and perform the computation mobile device and then forward the high level context data to the cloud. But the lack of storage and power in wearable sensors and mobile devices limit them to process large volume of sensor data using decent computational methods. In our proposed model, the job of a local server (which can be a mobile device) is only to collect the low level data (e.g. accelerometer data, ECG data, BP Monitor data, GPS coordinates, RFID status, captured images) from the AAL system and forward them directly to the CA (when processing is required) or to the PCS.

3. Context Aggregator(CA)

The job of the context aggregator (CA) is to integrate all the primitive contexts in a single context state using a context model. Sometimes a single context attribute value as an individual has no meaning if it is not interrelated with other contexts.

4. Context Providers(CP)

The context providers(CPs) is the main source for generating contexts. The CA distributes the low level data collected from different AAL systems to multiple CPs. Each CP applies well-known techniques to obtain primitive context from the low level data.

5. Context Management System(CMS)

A Context Management System (CMS) is the core component of the framework. The CMS that hold the big data. It stores the context histories of millions of patients.

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C. System Architecture:

Our proposed model takes the input data from the patient activity logs or reading some patterns. After getting the all details pre-processing is done to select the data aggregation features. After pre-processing main and important task of knowledge acquisition. In knowledge acquisition proposed method runs to learn the features of the data at runtime. After knowledge acquisition our method performs the clustering using unsupervised method to perform the classification of data. Depending upon the classified data the decision making process get started. In decision making the different decisions are taken based on the patient's data.

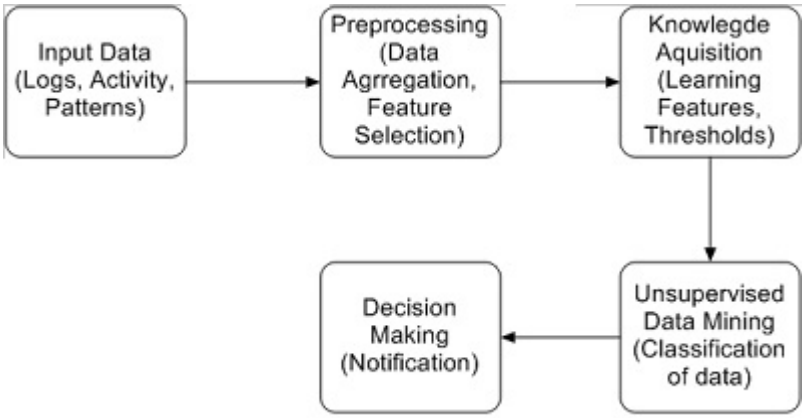

Fig: Proposed System.

IV. PROPOSED ALGORITHM

Proposed Association mining Algorithm:

Input: CjT and Smj for all AAL system j
Output: Decision vector Uj for all AAL system j

1. For each AAL system in parallel do
2. Q number ofcontext attributes inCjT
3. For all S in Smj
4. Find the Threshold value Th for all attributes q
5. For all context CjT
6. For all attributes q
7. If(Val(q) $\leqslant$ Th(q))
8. Then Uj Normal value
9. Else Uj Abnormal value
10. End for
11. End for
12. If (Any new data item arrives)
13. Repeat the above procedure for decision vector
14. Return Uj for all contexts.

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V. RESULTS AND DISCUSSION

In proposed work aim is to use hadoop technology for the correlation mining and association mining .In Experimental evaluation map-reduce algorithm an proposed association rule mining algorithm is used. ICU data set is used for processing. Using Map-Reduce algorithm data is processed and distributed in HDFS. Processed Flow-sheet data,monitor data, test data is stored in HDFS in sorted manner. After analysis monitor class generate which indicate in sorted manner. In proposed system semi-supervised method is used for data mining.

A] Practical Work:

Input: ICU dataset files in the form of Flow-sheet data, Lab data And Test data.

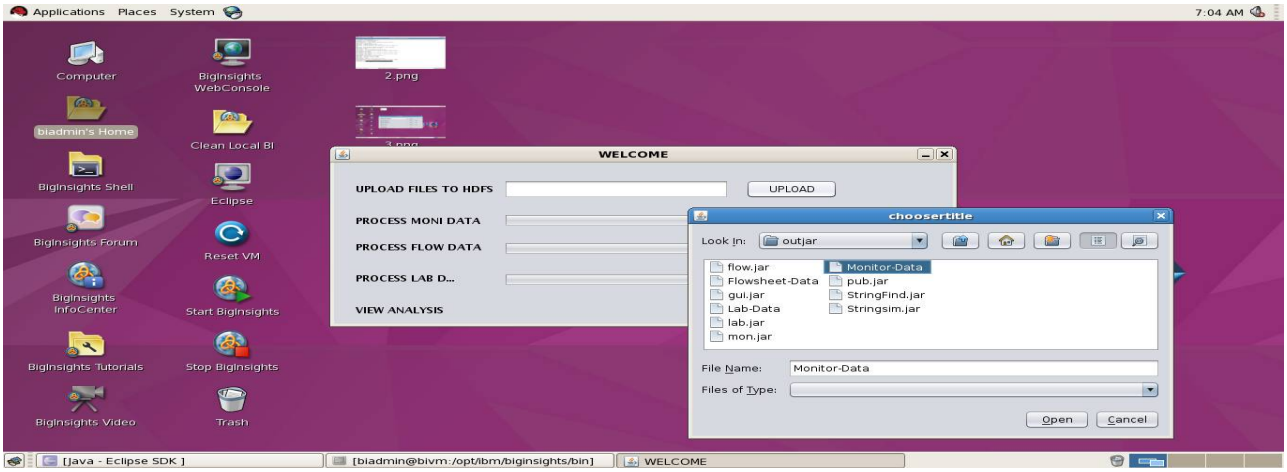

Fig 1.: Dataset File Uploaded

Map-reduce Algorithm is used. it will help for faster learning with greater knowledge. It reduce the transmission of repeated false alerts This proposed method provide innovative architectural model for context-aware monitoring. The proposed system provide step learning methodology in the fever of decision making our big data of patient.

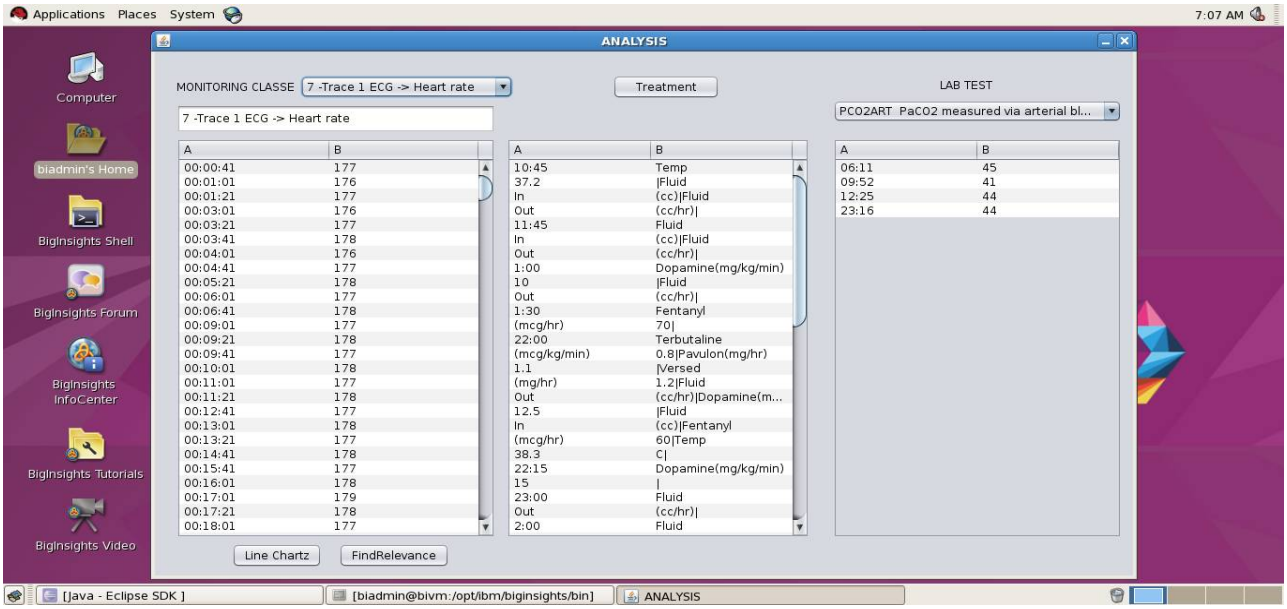

Fig2. : Analysis Of Uploaded Data

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B] Result:
Proposed association rule mining is applied. Graph show monitor value.

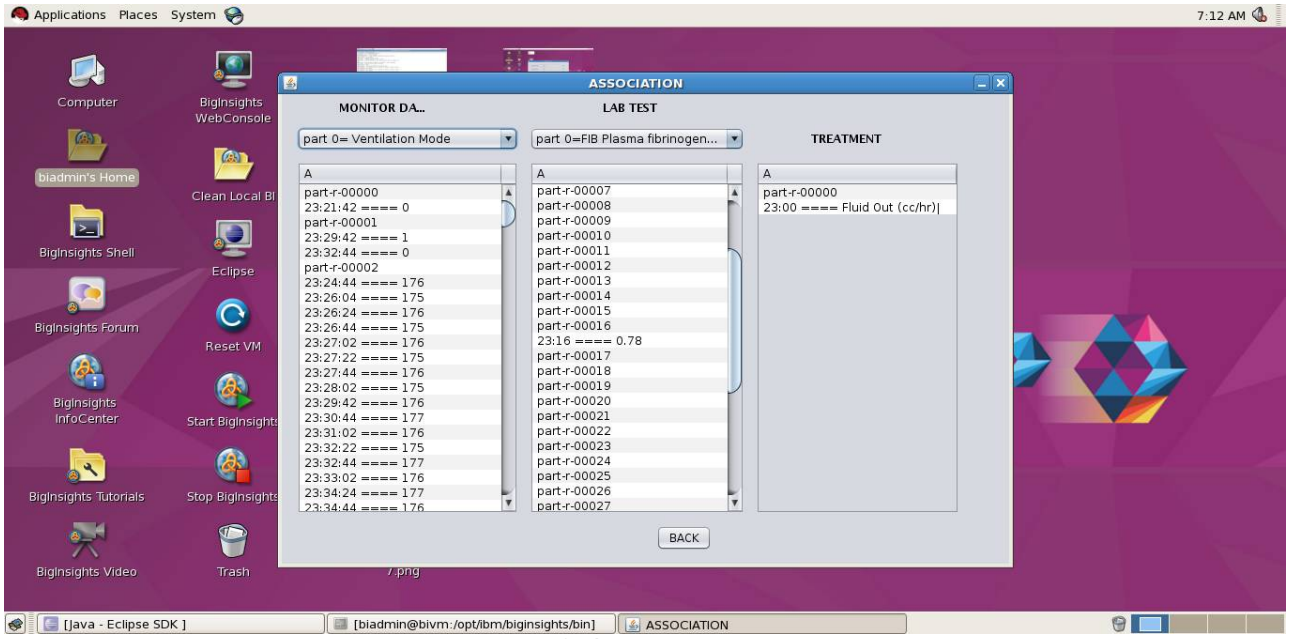

Fig. 3: Association

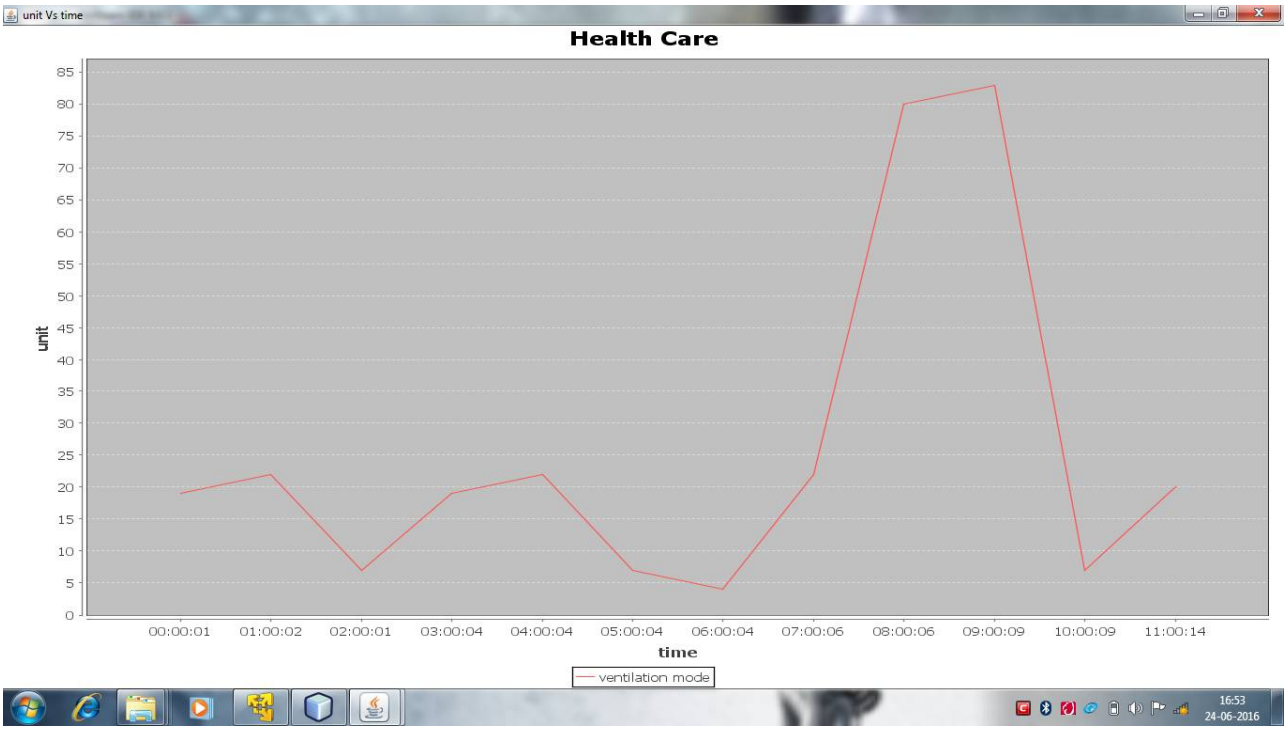

Fig. 4: Graph

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VI. CONCLUSION AND FUTURE WORK

The proposed system facilitates analysis of big data inside a cloud environment. It first mine the trends and patterns in the data of an single patient with associated probabilities and utilizes that knowledge to learn proper abnormal conditions. The results of this learning method are then applied in context-aware decision making processes for the patient. It implemented to illustrate the applicability of the framework that discovers the knowledge of classification to identify the actual abnormal conditions of patients having variations in blood pressure (BP) and heart rate(HR). The evaluation shows a much better estimate of detecting proper anomalous situations for different types of patients. The accuracy and efficiency obtained for the implemented case study demonstrate the effectiveness of the propose model. In future, intend to extend the model with more context domains.

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BIOGRAPHY

Ankita Galande is currently pursuing M.E (Computer) from Department of Computer Engineering, Bhivarabai Sawant College of Engineering and research, Pune, India. Savitribai Phule Pune University, Pune, Maharashtra, India -411041. she received her B.E (Computer Science and Engineering) Degree from PDEA's college of Engineering , Manjari, Pune Savitribai Phule Pune University, Pune,Maharashtra,India Her area of interest is Data Mining.

Prof.P.D.Chouksey received her B.E in Infomation Technology from RPCE, RTMNU University, MH. India, M.Tech in computer science and engineering, RTMNU University,MH.India. She is having 4 years of total experience in teaching. She guided many projects for B.E and M.E.Her area of research includes data mining and network security. She is currently working as Asst. Professor with Department of Computer Engineering, Bhivarabai Sawant College of Engineering and Research, Pune, MAH, India.