RESEARCH ARTICLE   OPEN ACCESS

Supporting Flexible, Efficient, and User-Interpretable Retrieval of Similar Time Series

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ABSTRACT

Day to day activities on internet raised current as well as archives data quantity on large scale. Thus its quite tough work to process such a large amount of data and impure form of data in decision making process. This paper proposes a framework in which Time Series feature get analysed and retrieved by using Temporal Abstract. It also provides multilevel abstraction mechanism and proper indexing techniques for efficient query issuing and efficient answering along with best future predictions. Using that predictions user able to build some preventive measures for the faults arise in decision making process.

Keywords:- *Temporal Abstraction (TA), Decision Making, Decision support, Time Series.*

I. INTRODUCTION

As far as real world application considers, there's a necessity to consider the past observed phenomenon over time, in order to describe its behaviour, and to exploit this information for future problem solving. In that kind of application every data will be of Time series data. This Time series data will be recorded by means of control instrument for every sequence of time [3]. Processing with time sequence of data will be tedious process. For ex in medical field, physicians asked to recognize small or rare irregularities in the series itself, or to identify it from past several cases. Here, we propose the methodologies and approaches providing users with different forms of flexibility namely,

- ➢ To exploit a different technique for dimensionality reduction and Time series retrieval, namely Temporal Abstraction (TA) [1].
- ➢ To use TA as the basis for a flexible, efficient, and user-interpretable retrieval of Time-series data, given a query.
- ➢ A flexible query language, in which queries can be expressed as sequences of symbols issued at different levels, according to the level of abstraction of data description and time granularity [6].
- ➢ A flexible and interactive retrieval process, in which the users can dynamically change the

level of abstraction they want to focus on, progressively

Reducing enlarging the retrieval set, supported by the system graphical interface. The Temporal Abstraction (TA) will be carried out by an efficient Viterbi Algorithm for retrieving the most accurate record with respect with the time sequence [1][12].

II. LITERATURE SURVEY

In previous time there are different kinds of frameworks and the concepts get introduces in development of the Time Series data and manipulation, but due to their some kind of disadvantages in there framework and in working that all the not used efficiently well [3][8]. Some of them frameworks and there disadvantages are as given,

- ➢ In Fuzzy Approach to Temporal Model Based Diagnosis for Intensive Care Unit framework provides Temporal Behavioral Model (TBM) that makes this integration possible and permits the specification of contextual information that may modify the TBM [1][12].
- ➢ This framework proposes a Temporal Behavioral Model (TBM) that makes this integration possible and able to gives specification of contextual information that may changes the TBM results [1].

➤ But this framework unable to undergo logical formulation in terms of temporal logic is not considered also it has the transformations limitations as the data size and complexity getting raised[1][4].

  ➤ In Case-based retrieval to support the treatment of end stage renal failure patient's system along with supporting quality assessment providing a useful input from the knowledge management perspective [2].

  ➤ The Retrieval process is then carried out as a two-step procedure, classification based on static features and interclass retrieval, in which dynamic features are considered [9].

  ➤ But Time series is not considered in this framework. Its working is carried out by black-box fashion, due to that it's not accurate and the final results may contain ambiguities and thus not fulfills the requirements of the users [2].

  ➤ In clinical decision support by Time series classification using Wavelets designed and implemented for decision support system for the classification of Time series [3].

  ➤ Firstly they got patterns which are retrieved from one of the time series by using support of the other time series process. Afterwards these patterns trained to transform with wavelets and matched for similarity by Case-Based Reasoning.

  ➤ This framework is restricted by mathematical transformation thus it is unable to implement for large and complex data.

  ➤ In accounting for temporal dimension in case based retrieval system they describe a framework for case representation and retrieval that is ableto take intoaccount the temporal dimension, and is used in any time dependent domain, which is particularly well suited for medical applications[4].

  ➤ But during execution and retrieval process Temporal abstraction is not carried out thus it won't work efficiently Its execution and retrieval process is also restricted to specific application domain due to that it unable to undergoes for the complex data[4].

  ➤ In clinical decision-support for diagnosing stress-related disorders by applying psycho physiological medical knowledge to an instance-based learning system they have been created a decision-support system which contains a signal classifier and a pattern identifier [5].

  ➤ The system performs an analysis of the physiological time series data concerned which would otherwise be performed manually by the user.

  ➤ But it doesn't consider temporal abstraction for time series data thus it quite hard to implement for the time series archived data.

III. PROPOSED SYSTEM

To support the decision making by analyzing and retrieving the past case record by considering the Timestamp of the record. To propose the efficient methodology called Temporal Abstraction (TA) to exploit a different technique for dimensionality reduction and Time series retrieval[1][2]. To use TA as the basis for a flexible, efficient, and user interpretable retrieval of Time series data, given a query.
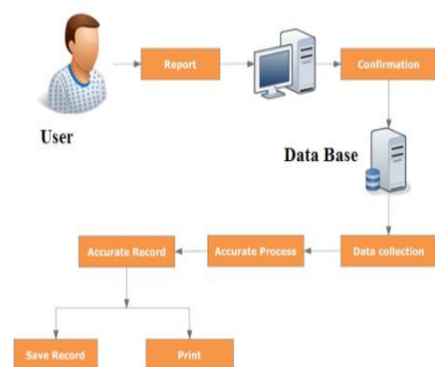

Fig 1.System Architecture

To provide users with different forms of flexibility as flexible query language as well as flexible and interactive retrieval process. By adapting the temporal abstraction [1], the most accurate record will be retrieve since it retrieved by the Time series. A considers the every time sequence which is recorded by the control instrument. To make retrieval of record for the generic repost provided by the physician. There are different modules through which the data flow & execution of project can understand. They are as given below;

1. Query Data Generation:-

Here the user needs to provide the input report for which the record has to retrieve on the basis of Time series [2] [3]. The input report will not
be readable so it has to be converted into intermediate data which is readable by the program. Then the data present in the intermediate data will be retrieved and provided for the physician. Then the data will be process for modifying the data in the report if necessary. Then the finalized data will be generated for the further processing.

2. Domain Selection:-

After acquiring the query data, the domain in which the query data have to be deal with will have to be analyzed [4]. The domain will lies in the query report by the user. Then the required record based on the domain will be clustered. Then the record for the respective domain will be retrieved.

3. Retrieving Record:-

Here the record that suits the query domain will be retrieved based on analyse of the input query data provided by the physician. Here the retrieved records will of same domain but different dimensionality that this record will be containing overall records for the domain provided in the query data. So it has to be gathered in the appropriate way[4].

4. Temporal Abstraction:-

The Outcome of retrieving records contains records of same dimensionality but different dimensions. So it's necessary to retrieve most accurate record for the query data provided by the physician. It retrieval of the resultant record will carried out by the temporal abstraction. For implementing the Temporal Abstraction an Efficient the Viterbi algorithm is used for enhancing the temporal abstraction [1]. Temporal abstraction will analyse the each and every dimension of the records with respect to Time series [2] [8]. Then the records that match the query data will be retrieved. It will be shortlisted record of the required set from the overall domain record. Then the most accurate dataset will be retrieved from the featured records. Then the detailed information of the accurate record will be provided to the user.

5. Generation of Report:-

After acquiring the most accurate record that matches the query data, it has to provide to the user in the most precise form. Hence in this module the finalized information will be saved in magnetic disk and also user can able to take printout of the information.

IV. CONCLUSIONS

By studying all the literature survey and other work related with the subject we found that there is requirement of development in the efficient execution of temporal abstraction. Thus this paper going to proposed one framework in which Time Series feature gets analysed and retrieved by using Temporal Abstraction (TA).Due to that data retrieval and execution of past or archive data is become easier. Also user able to get pure form of data for their other execution need. Using those results user are able to forecast best future predictions on basis of the archive data due to that user able to develop some preventive infrastructure for preventing those faults in process of decision making.

ACKNOWLLDGEMENT

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