July 2013

HUMAN ROBOTICS INTERACTION WITH DATA MINING TECHNIQUES

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Abstract- Human-robotics interactions generally consist of transfer of information from the humans to the robotics by using various algorithms, scientific tools and techniques. In this research paper human queries and tasks can be handled by human robotics and for the communication with the server-systems robotics acts as an interface. Human queries can be easily recognized with the help of data mining techniques. These Queries can be handled into three different parts. (a)Input device-used to collect the data (b) Human Robotics-act as an interface (c) Server System-used to process data. In the absence of interface interactions between the human and server system will not be possible. Here we are uses three types of data mining techniques like Classification, regression analysis and time series analysis. Each technique uses a separate type of data to perform mining task. The special focus of this paper is human and robotics follows master-slave relationship and ultimately humans successfully collaborate to achieve a joint action.

Keywords- *Data mining, human robotics, classification, Regression analysis, time series analysis, graph mining, structure mining.*

I. INTRODUCTION

In general Robotics is broad in discipline**. Human robotics interaction (HRI)** basically tells the study of interactions between the humans as well as between the robotics. There are two categories of robotics interactions where first one is called "Remote interactions" means human and the robotics are not co-located(i.e.-not present in the same location) and are separated spatially or even temporally and second one is called "Proximate interactions" means humans and the robotics are co-located(i.e.-present in the same location). Here, we are use "proximate interactions". In this paper, we are discussing about the broad category of human robotics in different areas like use of human robotics in industry called "Industrial robotics", use of human robotics in professional service called "Professional Service robotics" and use of human robotics for personal house holding works called "personal service robotics". Here, we are using "professional purpose robotics". The fundamental goal of HRI is to develop the principles and algorithms for robot systems that make them capable of direct, safe and effective interaction with humans. It also includes enabling high-level natural language communication with autonomous systems.

Data mining is a technique which is used to process the large amount of data and helps for searching the data and build relationship within the data. The major objectives for data mining are fast retrieval of data or information, Knowledge Discovery from the databases, to detect hidden patterns and those patterns which are previously unknown?, to reduce the level of complexity, time saving etc. The basic need for the use of data mining is to retrieve information quickly,

improving the quality and effectiveness of their decisions based on analysis. **In this research paper, we are merging artificial intelligence holds human robotics interaction with data mining so that human robotics and People can effectively and intuitively work together by directly handling of objects to one another and takes immediate action.** There are **many advantages** for using this combined approach. The **major advantage** to use such kind of this **combined approach** is to take appropriate action at a short interval of time. In figure 1, we see human robotics act as an interface between the user and the server system. To perform any task in first step, user set programs in the machine (i-e- under human robotics).In the next step, when user required performing any type of functionality then use his/her interface. Without usage of this interface communication or interaction with the server system will not be possible. In this way we can also say that **human robotics behave artificially**. And **other advantage is Security** about the private information of any organization also maintained that mean there is no chance of information loss, automatically that only depend on the hand of the person who actually done programming in it. In this we follows robotics designer (i.e.-manufacturer) act as a master and other team members are slave's robotics. In this manner, it follows **Mater-Slave relationship.** Different-2 type of data mining use different-2 types of algorithms. These algorithms firstly identify the type of data sample available for mining and after that it searches for the model that fits close to solving the problem. There are **basically two types of models** used that are classified as "Predictive" and "Descriptive". **Predictive Model:** It is used to predict the values of

the data by using known results of predictive model. This model involves some data mining tasks that are listed below:-
a) Classification
 b) Regression Analysis
c) Time Series Analysis

A.Classification

This technique is basically used for data analysis. The major goal of classification is to classify the objects is to number of categories referred to as classes. Whereas Instances of classes are called "Objects". Objects are compact data units specific to a particular problem which are called "Patterns". In this technical world we are generally use two steps under classification:-

Step-1) Classifier Construction:-It describes the pre-determined set of data classes. This step also describes a mapping function. Such kind of mapping is to be provided by using classification rules, decision trees, or by using some mathematical formulas.

Step-2) Usage of the classifier constructed:-In this second step, we have to directly apply the model for classification and the predictive accuracy of the classifier is estimated.

By using classification, first we have to consider three different categories of classes. Suppose Class "DM" is used to perform data mining, class "SM" is used to perform structure mining and class "GM" is used to perform graph mining. While using this technique user first have to choose the category of the class. After that user applies the construct of the classifier in which he/she uses pre-determined dataset as discussed earlier. With the help of mapping functions, classification rules will be applied to achieve accurate output.

B. Regression Analysis

This technique is used to calculate statistical measure that attempts to determine the strength of the relationship between one dependent variable and other independent variables. There are various types of regression analysis techniques are available most commonly types are **"Linear regression"** acts as a most simplest type and uses direct formula of straight line and measure accurate values and second one is called **"multiple regression"** which allow more than one input variable and allow for the fitting of complex models such as quadratic equations. Regression also enables you to forecast future values based on the present values and past data values.

It basically uses these existing data values and discovers mathematical formula and new derived formula is used to predict the future behavior. By using this technique if we use "Linear regression" in this case some certain type of mining is to be considered as a single input out of three given classes(Data mining, Structure mining, Graph mining) and in case of "Multiple Regression" there are two types of mining will be used in collective manner (Like data mining with graph mining, graph mining with structure mining and structure mining with data mining) similarly when humans will apply command on human robotics then they will perform an appropriate action as per programming done in their in-build system.

In this way, with the help of this technique human robotics can easily predict the dataset values for future. So, we can say that this combined approach helps to take appropriate action at a short interval of time.

C. Time Series Analysis

The use of time series analysis also helps to predict future values from the current values enable and set of values are time dependent. The values used for time series analysis are eventually distributed an hourly, daily, weekly, monthly, yearly and so on. We can draw time series graph (use graph mining) plot to visualize the amount of change in data with specific changes in time. By using this technique, whenever any user set session on human robotics then interaction or communication will only be possible before the session expire.

If at once, session will be expire after that communication between the robotics and server system will not be possible so user will be again reset the session values and work again. The major drawback of using this technology is there is no context in which to decide how to act and an alternative approach. Now, at present this is being tried involves imposing constraints on robot interactions from which more intelligent behavior can emerge.

II. RESEARCH METHODOLOGY

Before applying the data mining techniques on the data set, there should be a methodology that governs our work. Figure 1 depicts the work methodology used in this paper:-
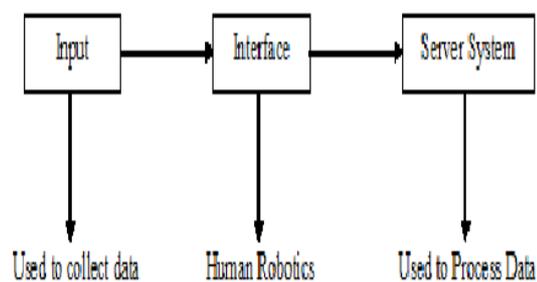

Figure 1: Interaction With the server system.

III. CONCLUSIONS

In this paper, we have discussed the combined approach of two separate broader areas named Data mining with artificial intelligence. It basically gives an idea how different data mining techniques can be used with artificial intelligence? And how human robotics behaves artificially intelligent? In general, we consider data mining is the component of artificial intelligence. How both are working together? By using this combined approach we will easily achieve our objective that is efficient results with a specific time interval.

IV. FUTURE WORK

In future this work can be extended by **replacing robotics with human in** then monthly salary problem of human also reduce (i.e. - money saving), we just invest at once and use for long life. **In this way this concept can also cover the objectives of data mining means time and cost both are save in this case.So,we can say that this combined approach is beneficial for us.** And we will also predict the behavior of the human towards work by applying **"Prediction data mining technique"**. **For example**: - human mood to do work or not and also interpreted human intensions with the help of sensors.

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ACKNOWLEDGEMENT

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