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Classification Based Pattern Analysis on the Medical Data in Health Care Environment

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ABSTRACT

In this paper discuss the classification based pattern analysis techniques. The classification based pattern analysis is very efficient process in compression of other techniques. In umbrella of classification technique there are various algorithm are there. The classification algorithm such as Decision Tree (DT), Support Vector Machine (SVM), KNN and neural network based classification technique. The process of classification depends on the value of feature attribute for the collection of data. The feature selection and feature optimization is important aspect for the improvement of classification process. The optimization process reduces the unwanted feature during the process of classification. [5] The medical disease data also have some noise data and boundary value data. For the optimization of feature used Ant Colony Optimization (ACO) technique. The Ant Colony Optimization technique is dynamic population based optimization algorithm. The values of artificial ants find the dissimilar value of attribute during the data selection process.

Keywords: ACO, KNN, SVM, DT

I. INTRODUCTION

In this paper discuss the classification based pattern analysis techniques. The classification based pattern analysis is very efficient process in compression of other techniques. In umbrella of classification technique there are various algorithm are there. The classification algorithm such as Decision Tree (DT), Support Vector Machine (SVM), KNN and neural network based classification technique. The process of classification depends on the value of feature attribute for the collection of data. The feature selection and feature optimization is important aspect for the improvement of classification process. The optimization process reduces the unwanted feature during the process of classification. [5] The medical disease data also have some noise data and boundary value data. For the optimization of feature used Ant Colony Optimization (ACO) technique. The Ant Colony Optimization technique is dynamic population based optimization algorithm. The values of artificial ants find the dissimilar value of attribute during the data selection process.

II. METHODS AND MATERIAL

A. Modified Ant Colony for Feature Selection of Data Set

The Ant Colony Optimization (ACO) process finds the continuity of similar feature. The process of ant colony optimization technique basically describe in terms of artificial ants. The process of ants finds the dissimilar and redundant group of partial features [6]. The process of feature optimization describe here. The process of feature optimization of partial feature data passes through the feature space of ant colony optimization. The mapping of partial data feature attribute according to their artificial ants required some standard derivation and parameter. On the basis of parameter estimate the feature similarity of two different features. Those features are most similar passes through the process of retrieval and increase the capacity of precision and recall. We proposed a new feature subset selection method for finding one-against-one class for data without alteration

of support vector machine. The proposed feature subset selection method is based on ant colony optimization; ant colony optimization is very famous meta-heuristic function for searching/finding similarity of data. In this method, introduced continuity of ants for similar features and dissimilar features collect into next node. In this process, ACO finds optimal selection of feature subset. Suppose ants find features of similarity in continuous root. Every ant of features compares their property value according to initial feature set. When deciding pattern is noise and matched, we should consider two factors: importance degree and easiness degree of noise and pattern. While walking ants deposit pheromone on the ground according to importance of the pattern and follow, in probability pheromone previously lay by other ants and the easiness degree of the noise.

Let F is a feature set and N is the total artificial ants and possibility of ant selection is s1,s2…….sn , now find the selection possibility of two ants in given solution is

$$SP(i,j) = \frac{1}{si - sj} \dots\dots\dots\dots\dots\dots (1)$$

Where si and sj is the dissimilar probability of two different ants. Now estimate the value of appetence of ants is

$$ACP(i+j) = \frac{\alpha i + \beta i}{N} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where αi and βi is ants whose selection possibility is maximum in terms of another ants the ratio of selection of ants is defined as $\frac{100}{N}$ On the basis of selection possibility estimate the value of artificial phenomenon value

$$\Delta\tau i = \frac{A.si}{ACP(i+j)} \dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Where A is constant phenomenon value

Now each iteration of pheromone value is increment and decrement according to their selection probability. The derivation of universal appetence probability is

$$p_{ii}^{k} = \begin{cases} [\tau_{ij(t)}] \; \alpha.[k_{ij}]\beta & if\ j \in j \dots\dots\dots (4) \\ 0 \quad otherwise \end{cases}$$

Where kij gives the information of heuristic search space and measure the selection possibility of artificial ants and finally getting the optimal COB feature of medical database for the processing of optimization.

B. SVM (Support Vector Machine)

Support vector Machine is binary classifier, the performance of classification of support vector machine is high in compression of another binary classifier such as decision tree, KNN and bay,s classifier [15]. Support Vector Machine (SVM) is a novel machine learning method based on statistical learning and it has been successfully applied to numerous classification and pattern recognition problems such as text categorization, image recognition and bioinformatics. SVM can be used for pattern recognition, regression analysis and principle component analysis. The achievements of SVM in training have Platt's the sequential minimal optimization method. These methods are directed at the training process, and not related to classification process. In the process of SVM training, all the samples are used. So it has no effect on the speed of the classification [15].

III. RESULTS AND DISCUSSION

Experiemntal Rsult And Process (Comparative Performance Evaluation)

Table 1 : Comparative performance evaluation for classification using KNN, SVM and SVM-ANT classifier

Method Name	Elapsed Time (Sec.)	Mean Absolute Error	Mean Relative Error	Accuracy
KNN	24.43	41	26.81	48.18
SVM	24.46	39.5	24.23	59.18
SVM-ANT	23.88	39.5	32.28	62.58

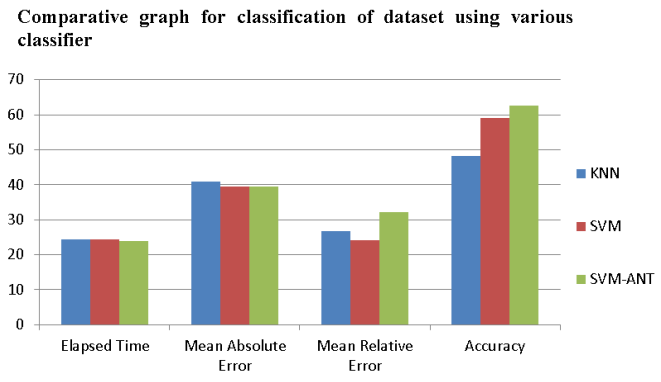

Figure 1: Comparative performance evaluation for classification using KNN, SVM and SVM-ANT classifier. Here find the value of Elapsed Time, Mean Absolute error, Mean Relative Error and Accuracy.

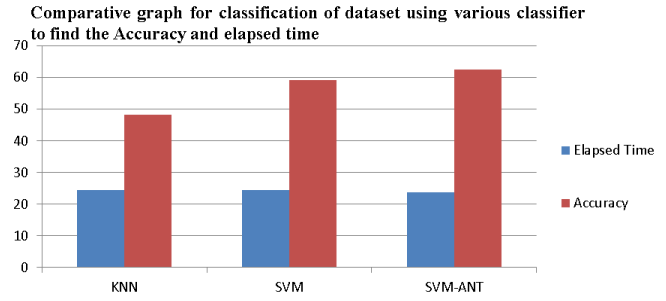

Figure 2 : Comparative performance evaluations for classification using KNN, SVM and SVM-ANT classifier. Here find the value of Elapsed Time and Accuracy.

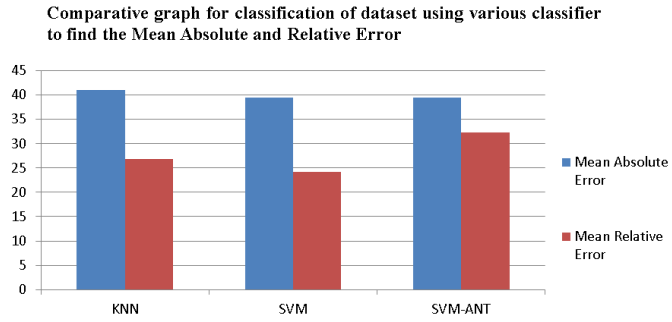

Figure 3 : Comparative performance evaluations for classification using KNN, SVM and SVM-ANT classifier. Here find the value of Mean Absolute Error and Mean Relative Error.

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