A Cluster Adaptive Genetic Model for Improving the Recommender System

Neha Bhatia
1Student, M.Tech, CSE Department Satpriya Group of Institutions, Rohtak (India)

Abstract—Recommender System is a process or model that can be applied to identify the user choice based on some statistical observations. In this work, a movie recommender system is defined using cluster cluster adaptive genetic approach. In first phase of this model, the clustering is applied on user dataset to identify the most similar users. Later on, the statistical analysis is applied to generate the collaborative recommender statistics. Finally, the generated featured dataset is processed on genetic approach to identify the effective recommendation result. The work results shows that the method has reduced the error rate and improved the accuracy of recommender system.

Keywords: Recommender System, Similarity Analysis, Clustering, Genetics

I. INTRODUCTION

Recommender system is one of the important utility and aspect over the web, applications and social networks. The recommender system is about to predict the user interest and suggest the user some other product or scheme option based on this interest prediction. The global user specific analysis can be applied predict this interest. The feature driven analysis can be combined to improve the results of recommender system. It is considered as the automated process that provides the interest artifact generation and provide the interest specific rate generation. The method is having the significance for both the user and the provider. The user where gets the product information which can be effective and suitable for him, for the provider, the product sale or the client will be increased. It is considered as a feature driven model defined in various models including book interest analysis, movie interest observation, tourism place analysis etc. The recommender systems are today integrated with various major web application to provide effective and adaptive suggestions so that the product sale and service will be improved. The feature characterization is here obtained respective to the product or the item. The recommender system is based on two main aspects called the user and the product or the service for which the recommendation is applied. The basic recommender system for item recommendation is shown here in figure 1

II. RELATED WORK

Gaol et. al.[1] has defined a graph mining approach for fileration of social network rules and provided a resource integrated method for generating the graph pattern in more effective form. The heterogenous person connectivity graph was processed to extract the relevant information which was later on processed under homology method for generation of patterns. These patterns are considered as the rules based on interactive efforts and methods which are defined for effective service discovery so that the application driven work can be performed. The mathematical rule based recommendation improved the accuracy and degree of conformation. Safaei et. al.[2] has provided a method for action based predictive method to track the user activities and the relational observation. Author defined different weight rules based on user level weight assignment. The weights assignment is based on different parameters and applied the predictive measure. The collaborative analysis is applied to identify the community class of a user.

Rao et. al[3] provided a work on relationship driven analysis on community group. The analysis is applied based on graph mining techniques along with communication relationship observation. Author
applied basic graph traversing and representation methods for generating the relative community of the group. The identification of best friend is also defined based on knowledge driven analysis. Rehman et. al.[4] has combined the data mining methods with graph mining approaches to generate the critical evaluation. Author defined cluster based method for critical evaluation for similarity analysis between the users. The information processing is controlled by classification algorithm to identify the recognition rate.

Zhang et. al.[5] provided a work on characteristics integrating for uncertain graph analysis. Author identified the uncertain existence of data as well as its relationship with out variables. A graph based modeling was provided here as the comprehensive uncertain graph processing. The vertex based analysis was provided with attribute range specification. Different aspects of this uncertain social network was provided for in-depth attribute analysis. Bringmann et. al.[6] defined a work on power law degree for distribution optimization and provided the structural observation so that the inspired data values can be qualified. Author provided a direction specific modeling for effective data processing with nonlinear constraint observation. The reported diameter based shrink analysis was provided to achieve the contrast driven analysis applied over the network. The social network was evaluated under graph concept to build the relationship. Yager et. al.[7] has provided a work on fuzzy set based granular computing for extensive technological improvement. A fuzzy graph based generalized method was provided to generate the connection based analysis so that the effective extension to the network will be obtained. A fuzzy set based paradigm analysis was provided to control the social network connectivity. The bridge between the human analyst and formal modeling was provided to control the communication efforts.

III. RESEARCH METHODOLOGY

In this work, a hybrid recommender system is defined for expected rating of a user for a movie. The work is defined to improve both the content based and collaborative recommender system. At the first stage, the clustering will be applied on content based recommender system to filter the processing data. In second stage, FCM will be applied on collaborative system to improve the result effectiveness. Finally, the weights will be applied to both recommenders and mapping set will be considered as data pool for genetic process. The genetic based implementation will be defined to identify the most effective rating. The work is defined to reduce the error in rating identification. The work model is given as

Figure 2 : Proposed Model

Here figure 2 has shown the proposed work model applied in this presented work to perform the prediction of movie rating for a user. The proposed genetic improved hybrid model has provided the level specific mapping. At the earlier phase of this model, the content specific mapping is defined. The distance driven weighted map is here applied using content based recommender system. The social network was evaluated under graph concept to build the relationship. Yager et. al.[7] has provided a work on fuzzy set based granular computing for extensive technological improvement. A fuzzy graph based generalized method was provided to generate the connection based analysis so that the effective extension to the network will be obtained. A fuzzy set based paradigm analysis was provided to control the social network connectivity. The bridge between the human analyst and formal modeling was provided to control the communication efforts.
generate the new population element. At the final stage, the mutation function is also applied to perform the rating prediction.

IV. RESULTS

The presented work is applied on MovieLens dataset. This dataset is collected from secondary web source. This dataset can be driven from the Movie http://grouplens.org/datasets/movielens/. The data must have following features

- Dataset is having the description of movies along with movie type and other description.
- A user oriented dataset is required.
- A user and movie rank dataset is required for the work.
- Dataset is present in .csv format
- Dataset is divided in training and testing data under 90:10 ratio

The work is applied on a sample set of 5 users. For which the predictive rating results are obtained. The rating results obtained are shown here in figure 3.

Here figure 3 has showed the average rating generated for the 5 users defined as the input sample set. The figure has showed the actual rating obtained using the cluster improved genetic method. This improved optimized hybrid recommender system has generated the effective recommendation for movies.

Figure 3: Rating Results

Here figure 4 has showed the error rate optimization results obtained by using genetic based optimization method. The results here are defined based on the aggregative analysis applied for all the movies and relatively distance mapping between the actual and obtained results. The figure shows that the method has provided the significant improvement in rating generation for all users.

V. CONCLUSION

In this presented work, a optimization adaptive recommendation results are provided. The model first applied the clustering algorithm to identify the similar users. Later on, the genetic integrated collaborative recommender is applied to generate the optimized results. The results shows that that the method has provided the effective recommendation with lesser error rate.

REFERENCES


