

Fuzzy Tree Matching-based Personalized e-Learning Recommender System

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ABSTRACT

E-Learning systems are very popular in educational establishments because of the manufacture of web-based information and communication technologies. There are many of the recommendation system are giving recommendation for the fired query. But very little are recommending by having continuous stream of exercises for the user to guide them properly. As a solution of above problem is being developed to permit educators to assess on-line learning activities, the web usage mining applications of users in the context of e-learning, educators and e-learning site designers. To enhance the process of the recommendation in E learning sector proposed system provides a best way of managing the users query to narrow down the student option to help to select his best course using fuzzy logic which powered with ontology and Tree hierarchy. So proposed methodology put forwards an idea of E learning system by M tree hierarchy which is powered with ontology for semantic relationship by using fuzzy logic.

Keywords: Ontology Reasoning, Fuzzy Tree, jaccard distance, collaborative Filtering.

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I. INTRODUCTION

The e-learning system is most popular technique in the computer science field nowadays. Researchers are always giving their best to develop the e-learning technologies. The increasingly development of e-learning systems gives learners with better opportunities to access learning activities online, and this greatly supports learning practices and enhances. There are lots of benefits to e-learning system, it is very popular in education development because the development of web based information and knowledge in data mining. for a learner using a web-based course delivery environment, it could be better to track the activities happening in the course web site and extract patterns and behaviors prompting needs to change, improve, or adapt the course material.

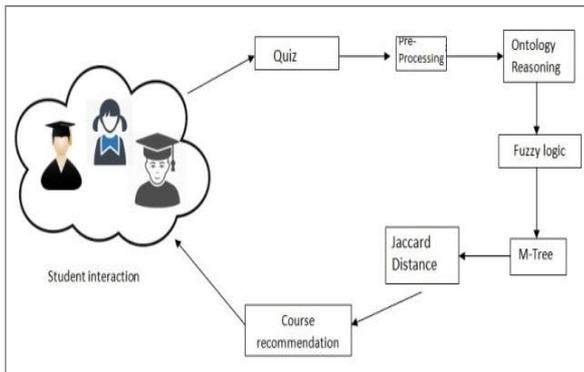
Recommendation system is increasingly popular and many recommendation approaches have been proposed. There are three recommendation approaches which is most commonly used are collaborative filtering (cf), content-based (cb) and knowledge-based (kb) techniques. The cf technique provide a

people make choices to take decision which is based on other people opinions who take same interests. Cb techniques recommend items that are equal to those previously preferred by a specific user. Kb techniques provide items to users depend on knowledge about the items and users. Each technique has its limitations, like the item content dependency problem and over-specialization problem for cb, and the cold start and sparsity problems for cf. To achieve higher performance and reduce the drawbacks of the typical recommendation approaches, a hybrid recommendation approach can be manufacture by joining the better features of two or more recommendation techniques into one hybrid approach. There are many recommendation techniques, like data mining, agents and reasoning, have been established and applied into recommender systems.

Most data mining algorithms need specific parameters and threshold values to tune the discovery process, the users of web usage mining applications in the context of e-learning, namely educators and e-learning site designers, are not necessarily savvy in the intricate complexities of data mining

algorithms. For this purpose we have tried to design new algorithms that need minimum input from the user and automatically adjust to the web log data at hand.

II. PROPOSED SYSTEM



In these starting step students/users undergone through the general quiz. In quiz various questions are asked to the students/users which plays important role in the course recommendation. The answers of the quiz questions are stored in a vector for next use.

Then students/users fired the query containing the attributes such as father's occupation, annual income and the job urgency.

As the entered query is in natural language the needed attributes are need to scrutinize. Before scrutinization takes place pre-processing is done on the query. Pre-processing helps in dimension reduction. It lowers the time and space complexity of the operation. Once the pre-processing is done attribute scrutinization is performed with the help of ontology. Ontology is the formal naming technology used to find the relationship between the different entities. Here in our scenario the main motto behind ontology use is to find the parents of the word i.e. the category to which attributes are belonged.

For generation the ontology Protégé toll is being used by the system. Till this step all the necessary attributes get identified. So fuzzy logic is used to label all these attributes. This labelling is done according to the importance of the attribute values.

Fuzzy labels are fed to the Mtree for proper manipulation as the data being generated by the fuzzy is not in proper format. Next to M Tree Jaccard calculation is used to compare among the different courses. The course recommendation is done by using the collaborative filtering technique where past recommendations are considered by the system. If the system finds the threshold number of previous attributes matching with the current query attributes then system will not going to repeat the course recommendation process again Instead of that system will give the previous recommendation only which saves the extra iterations of recommendation.

Equations

Jaccard Distance

$$SJ = a/(a + b + c), \text{ where}$$

SJ = Jaccard similarity coefficient,

a = number of species common to (shared by) quadrats,

b = number of species unique to the first quadrat, and

c = number of species unique to the second quadrat

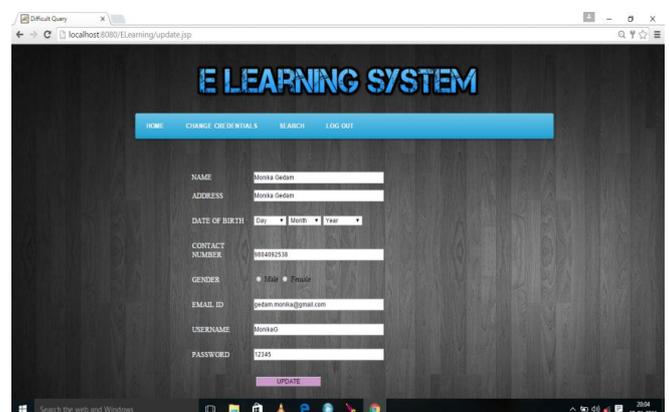
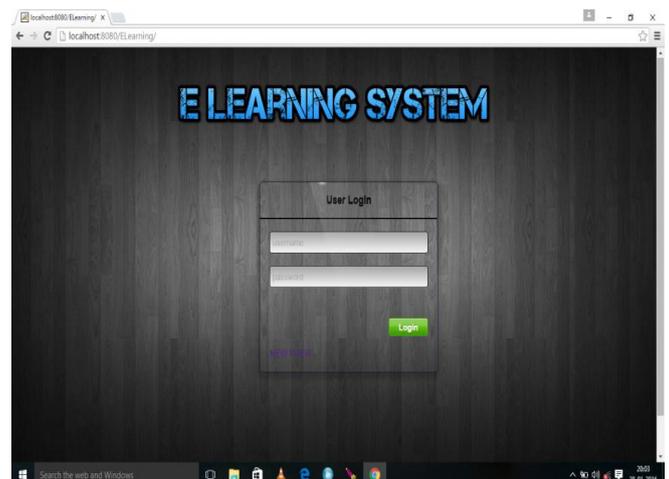
III.RESULT

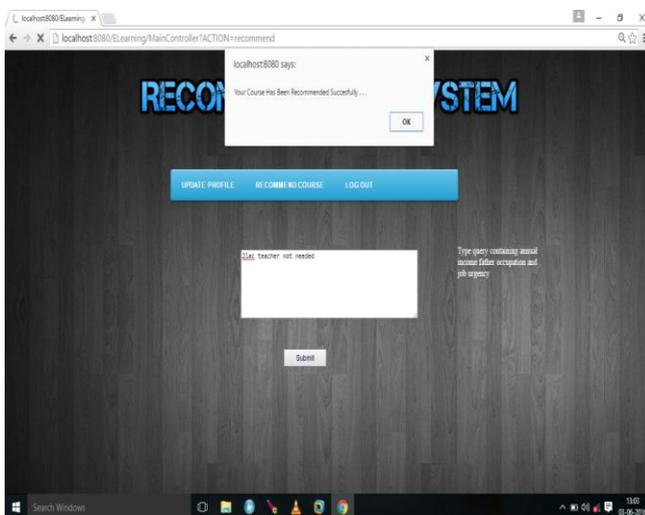
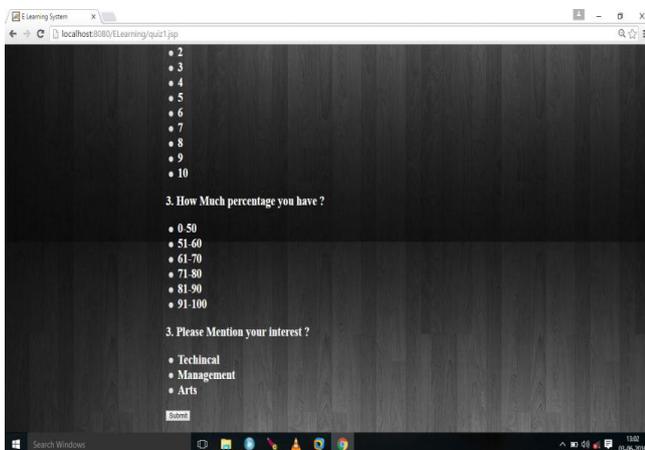
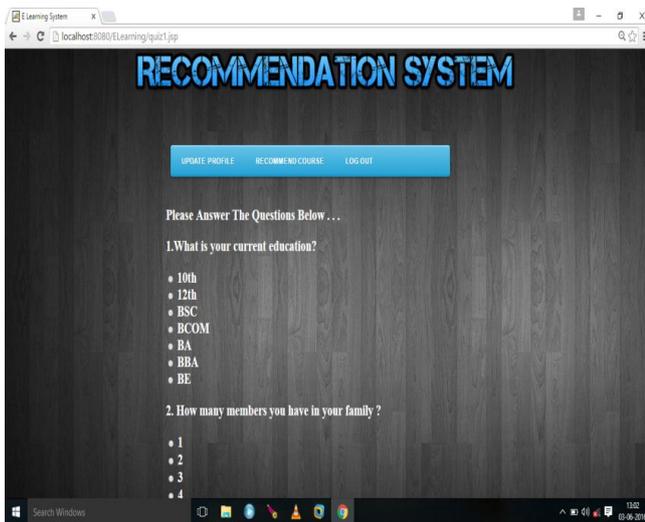
We ran our proposed system over 7 times for different user query to provide recommendation to the end user who Assigned the rank based on his opinion.

For measurement of the accuracy we used MRR as the best measuring technique, where from the results we extracted the best one and assigns a rank according to its performance out of 5 that will be eventually an opinion.

The ranks are assigned as 1,1/2, 1,3,1/4, 1/5 and 0 according to the opinions and then they are naming as Reciprocal Rank (RR), The mean reciprocal rank (MRR) can be given as the mean rank over number of Runs.

$$MRR = \frac{\sum_{i=1}^N 1/Rank_i}{N}$$





IV. OBJECTIVE AND SCOPE

1. Objective
 - a. Handling user query in natural narration
 - b. Student counseling using semantic questionnaires
 - c. Decision taking based on tree hierarchy and Fuzzy classification
 - d. Enhancing Recommendation using collaboration
2. Scope

- a. The proposed system can enhance to recommend the courses from more depth hierarchy
- b. The proposed system can host the application as web in internet
- c. System enhance to develop as mobile app
- d. System can enhance to take detailed enquiry questions regarding academics and family background

V. CONCLUSION

Proposed system successfully scrutinizing the user requirement more semantically using ontology and according to this the decisions is taking using Fuzzy tree combination. Then finally the a hybrid recommendation will be provided using collaborative filtering which is powered with Jaccard Distance and content based recommendation successfully to the user with high precision results

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