

**A NOVEL ENHANCED COLLABORATIVE
FILTERING BASED RECOMMENDATION
SYSTEM FOR ENGINEERING CAREER
DETERMINATION**

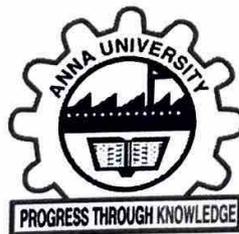
A THESIS

Submitted by

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ABSTRACT

As per the AICTE record, number of students successfully completed the courses in India is approximately 15 lacks. But, the placed students count is approximately 7 lacks only. It states the national employability problem. Maximum numbers of graduates are migrating from their core domain because of the guidance given by their family members, relatives or friends. Based on the finding of students mental ability and their knowledge we can give suggestion to the engineering students domain. For this Recommendation Systems (RS) is capable to perform well.

Collaborative Filtering (CF) is one of the popular methods in RS. At the maximum, RS is implemented in a business intention to recommend the products, movies, travel guidance etc. But in this work, the efficient advisory tool is developed for the younger generation to choose their right career based on their knowledge level. Finding the student's mental ability and the acquired knowledge from their given data is the major aspiration of this advisory tool. RS suffers from the data sparsity problem, recommendation inaccuracy and big error in predictions etc., CF based RS is used to prevent the data sparsity issue and less accuracy. So, A hybrid FRST-IBCF-CB technique is proposed to improve the efficiency in RS prediction.

Initially, a novel algorithm of Fuzzy Rough Set Theory Based Collaborative Filter (FRSTBCF) is developed to prevent the big error in prediction issue. This is a web based online recommendation, implemented by using R language and its packages "shiny" and "recommenderlab". It is experimented with collection of students functional and technical competence level data set. The dataset is gathered with the help of a web based user interface and stored

it in a common repository. It is divided into the training set and test set by using the K fold cross validation approach. The training set is used to train the developed FRSTBCF based model and the existing models like Item Based Collaborative Filtering using the Cosine similarity (IBCF-COS), IBCF using the Pearson correlation (IBCF-COR), IBCF using the Jaccard similarity (IBCF-JAC) and Singular Value Decomposition approximation (SVD). Test data set is used to test the performance of the proposed FRSTBCF algorithm.

To measure the rating prediction accuracy, Root Mean Square Error (RMSE), Mean Square Error (MSE) and Mean Absolute Error (MAE) values are calculated and compared with the existing technique. The proposed model FRSTBCF has much lower error rate and its precision value is comparatively identical with the existing system.

Secondly, fusion the FRSTBCF algorithm with the traditional Content-Based Recommendation (CB) is proposed to build the career recommendation system for the engineering students. It is implemented as a web based technique and its termed as FRST-IBCF-CB technique. To evaluate the FRST-IBCF-CB technique, real time data is collected from engineering students. Finally, an Android OS based Mobile app is developed for the student's career recommendation system. The Android's component WebView is used to fulfill the Mobile App development. These days, everyone is expecting their day to day needs and the way to access it to be there in their hands. Hence, this mobile enabled student's career recommendation system is taken into the consideration. This is a great potential to connect and collaborate with each students. Also, it is reinforcing the brand value of the proposed RS. With the help of that student's feedback, the metrics like true positive, false positive, true negative and false negative are measured to find the correctness of the proposed model of web based

system and mobile app. Accuracy and precision values of this system is 85% and 80% respectively.

In future, the student's career recommendation system support is extended to the other Mobile OS and also to support other fields likes online shopping, marketing, health care etc.,