Intelligent and Deep Learning Collaborative method for E-Learning Educational Platform using TensorFlow

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Article History: Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

Abstract: Nowadays, online learning is platforms are played important role for all the communities. Sitting one place accessing whole world and share their contents through internet media such as webinars, social media, etc. In this paper, we use deep learning method to analyse E-learning platforms using Google TensorFlow. In this model has processing natural language data, convolution neural network and recurrent neural network models. We have identified the clustering of E-learning platforms using content wise, domain wise and selection wise in which we can easily apply association rule mining for identifying prioritization. Those who are accessing the E-learning platforms can be collected and apply Apriori algorithm is used for clustering. We used semantic method for combination of cluster and association rule finding score. In this approach we give prediction result for which platform are used more useful of learning community and gives comparative study of various learning systems. The result is evaluated by using TensorFlow and compares the performance.

Keywords: E-Learning platforms, Intelligent System, Deep Learning, TensorFlow, Association, Clustering

1. Introduction

Current scenario online based learning is one of the important tools to access the resource. Instead conventional or traditional method this method has more efficient and ease of use. The power of internet is played vital role in this scenario. The deep learning approaches are used in E-commerce domain for customer reviews, recommendation systems for purchasing products and thereof. The usage of internet and online based learning are increasing rapidly[1]. More of data and dataset is used today and extracting logs are big challenging task. Collaborative learning approach is used for request feed and collecting large dataset modelling [2].

The comparison of user preference and dynamic model is used for filtering content and compare the performance [3][4]. The recommendation system is useful from reading contents and hybrid model for verifying all limitations [5].The online educational resource are revolting the world such as Massive open online courses like Coursera, Edx, Udemy, NPTEL ,etc. The learners can easily find the resources and their learning credentials. Some of the courses are allowed to transfer their credit to regular academic courses [6].

Currently the education system has emerging research area and different models are suggested for learning activities. The use of various recommendation systems is available for learning by online, preferences, acquiring skills and self interest [7]. The suggestion model is created for our proposed system based on courses, recommendation and preferences. In this paper, we describes following sections, section 2 describes about related works, section 3 deals about proposed model and their recommendations, section 4 explains implementations and section 5 gives conclusion and results.

2. Related works

Apriori based association rule mining is applied for developing recommendation for monitoring content and quality factor. Tewari et al, the content based filtering method is used for analysing contents and

collaborative modelling feature prediction. The recommendation system involves data integrity, scalability and recommendation modelling. This approach provides the result of content filtering using association rules [8].

The enablement of social media platforms is rolling the world. Single day the huge volume of data can be used in the medium of internet across world. The public opinion is collected by courses, outcomes, learning platforms and management [9]. The use of resources and medium are two important factors while affecting E-learning system by Manikandan et al. Previous case studies are said that support vector machines, machine approaches and Bayesian models are used for analyzing online platforms [10].

In recent years, the study of various researches reviews need of new method to analyze the online contents and learning system [11]. The combination of data analytics, intelligent systems and natural language processing models are implemented in single learning models. Google provides all feature enabled platform for analysing platforms using TensorFlow. Deep learning model is proposed for analyzing E-learning platforms using content, courses and outcome wise [12][13].

3. Proposed Model

The number of persons using online courses and learning platforms is increased rapidly. The availability and volume of data usages are heavy and unique method is needed to analyse the dataset. From the learners point, the effective decision making principles are required for getting information about courses and their assessment. Our proposed method provides based on recommendations and needs we design following recommendation models and shown in figure 1.

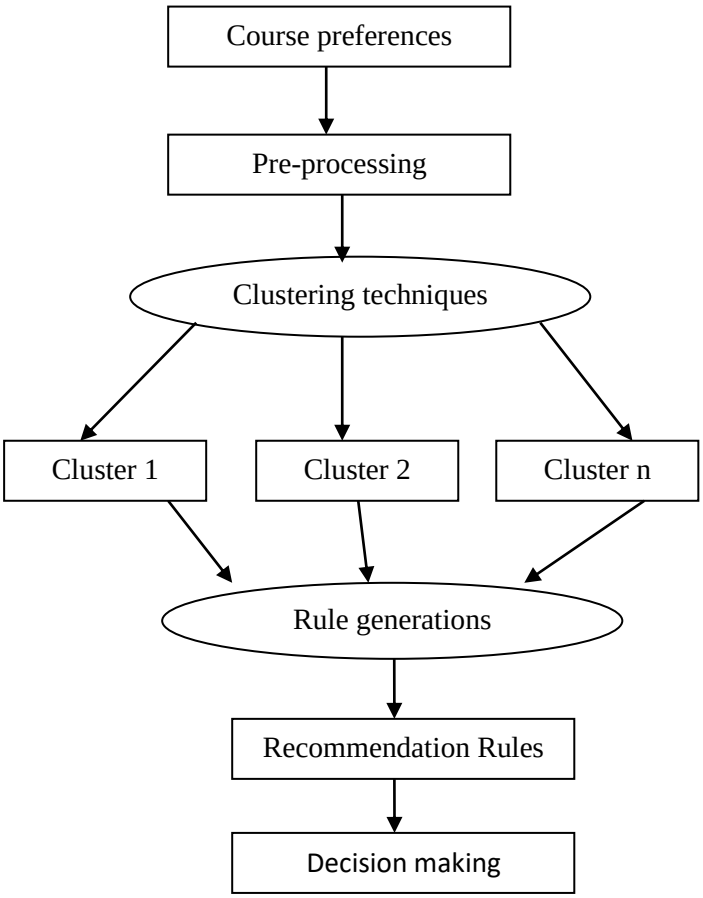


Figure 1: Proposed recommendation model

The following inputs questionnaires are considered for implementing our proposed model,

Table 1. Set questionaries for implementing our proposed model

a. What is the major effect for after applying clustering method for covering all input requests?
b. Why the association rule mining is need of recommendation model?
c. While applying clustering what are the attributes is needed for settling learners perspective?
d. What is effect after applying rule mining and clustering?
e. Whether sequential access is needed for recommending user inputs and learners?
f. How the prediction model is useful for combining both models?

In this section, we used covolutional neural network mode for configuring input dataset. TensorFlow is used for analysing pattern by using following dataset. The 5,00,000 input logs are taken into account (Google Content API) and set cluster size as 10,000 per 1 count model. From the normalized vector is calculated as follows,

$V_i' = (V_i - V_i min) / (V_i max – V_i min)$ where as Vi – input vector of given dataset model, and V'_i – normalized vector.

Video Words is used for calculating contents or words in given E-learning contents. For example 4000 words is available means is clustered and apply convolution technique for modelling and clustering.

The neural network is applied for converting support vector model inputs to regional specific dataset. The support vector classifier is used for find region specific clusters and fined the configurations of each proposed models. The trained data is applied for sigmoid activation process.

Based on input cluster groups we created one dimensional convolutional network model and shown in figure 2. In this case 12 kernels and 1x3 matrix model is used. The pooling of each parameter size is fixed as 3x3 index medium. So we can generated three dimensional data model using above index terms.

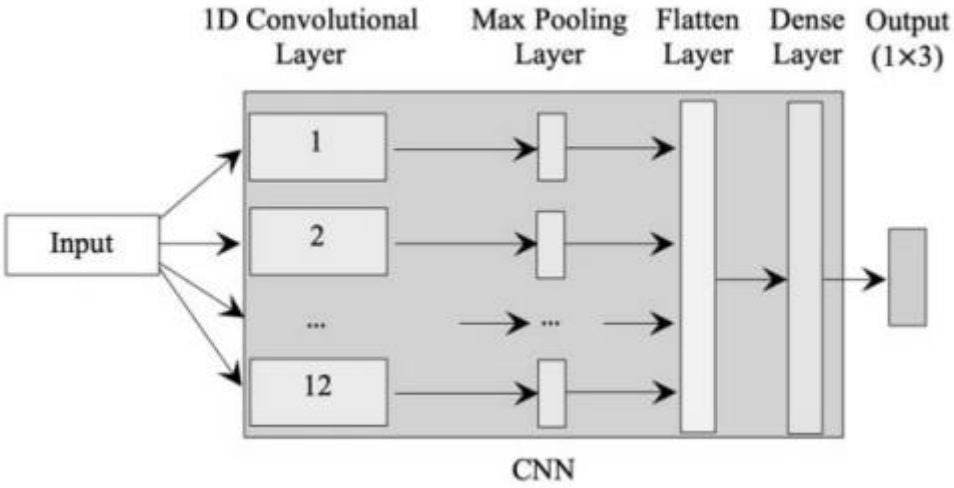


Figure 2 Convolutional neural network model for handling patterns

The above setup has 3 layer models with configuration reporting system. The three layer model has input size of 1000 region and non region coordinates are 2000 pattern. This setup the given regions are divided by basic element table and region specific modelling. The output each directed values of 12 kernel space 50 convolution model plane.

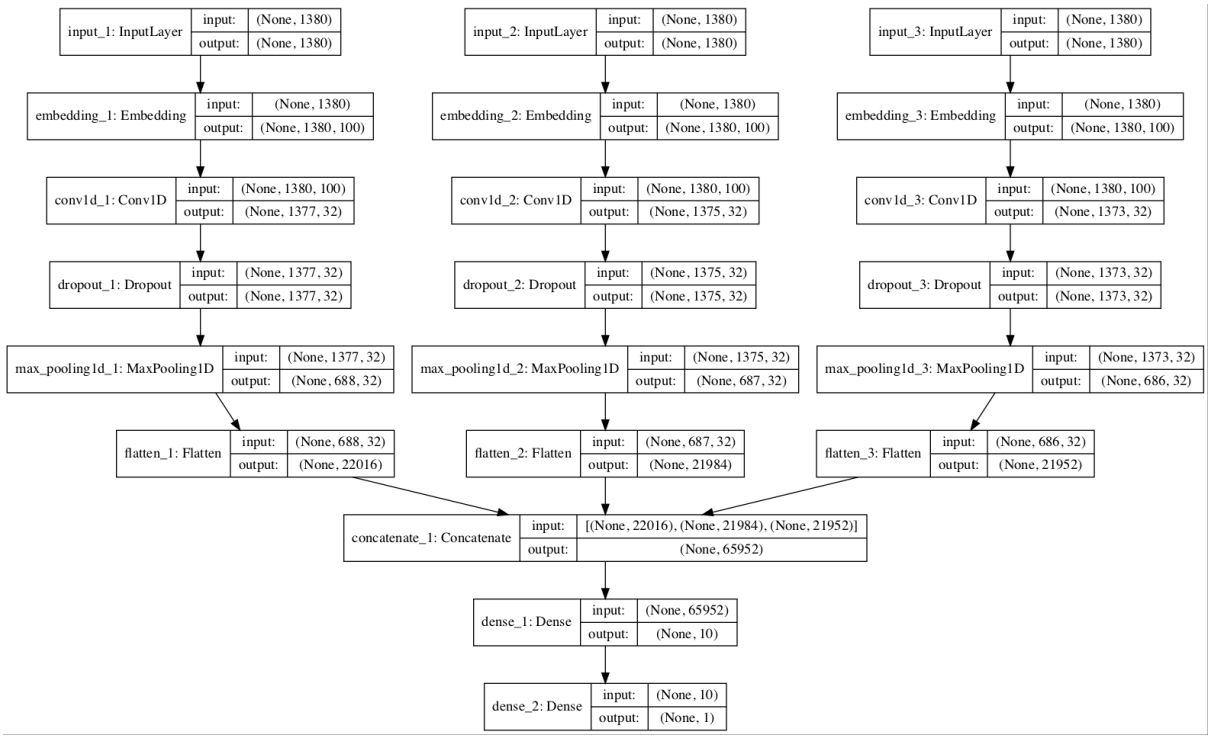


Figure 3 Convolutional neural network dataset for our proposed input dataset from TensorFlow

The above setup is created from TenorFlow from input dataset given by E-learning model. This network is aimed for measuring bi-directional learning management model. The multiple convolutional networks are created based on attributes and values.

Recommendation Model

Table 2. Association rule mining for support and confidence factor calculations

Association rule is generated by using courses, outcome and assessment patterns. The rule has in the form of {-g',g ..., |g} = > {|g-g'|} € C, C is the course details. When evaluating above rule we set common attribute factors, a. The support and confidence factor is assigned to each tuples in the data set. A pattern is created for each subset b. The number of tuples is satisfied the rule part means we can fix it as interested set values. c. If learners perceptive the user part can be set by target and assessment privileges d. If more rules are generated means high support and confidence factor is set e. The not matching contents or learning elements are grouped and from cluster f. The target of each students and their recommendation are set by grades for finding prediction factors g. The rules are marked and recommendation is created based on course sequence, acceptance and completion ratio. h. The learning system will generate report for each records based on assessment, completion and their active participations i. if they completed prerequisite courses means that also considered for evaluation and processing

4. Implementation

We used open online courses dataset for experiments. In this case 25,000 learners registration taken from Webinarjam platforms. The GoogleSpread sheet is used for collecting responses and registration. The total number courses are 30 and learner can opt 5 courses. We are taken this record and applied in TensorFlow for pre-processing, association, clusterting and association processing. The grades are set by 0 and 1 and below figure 3 shows that spread sheet registrations.

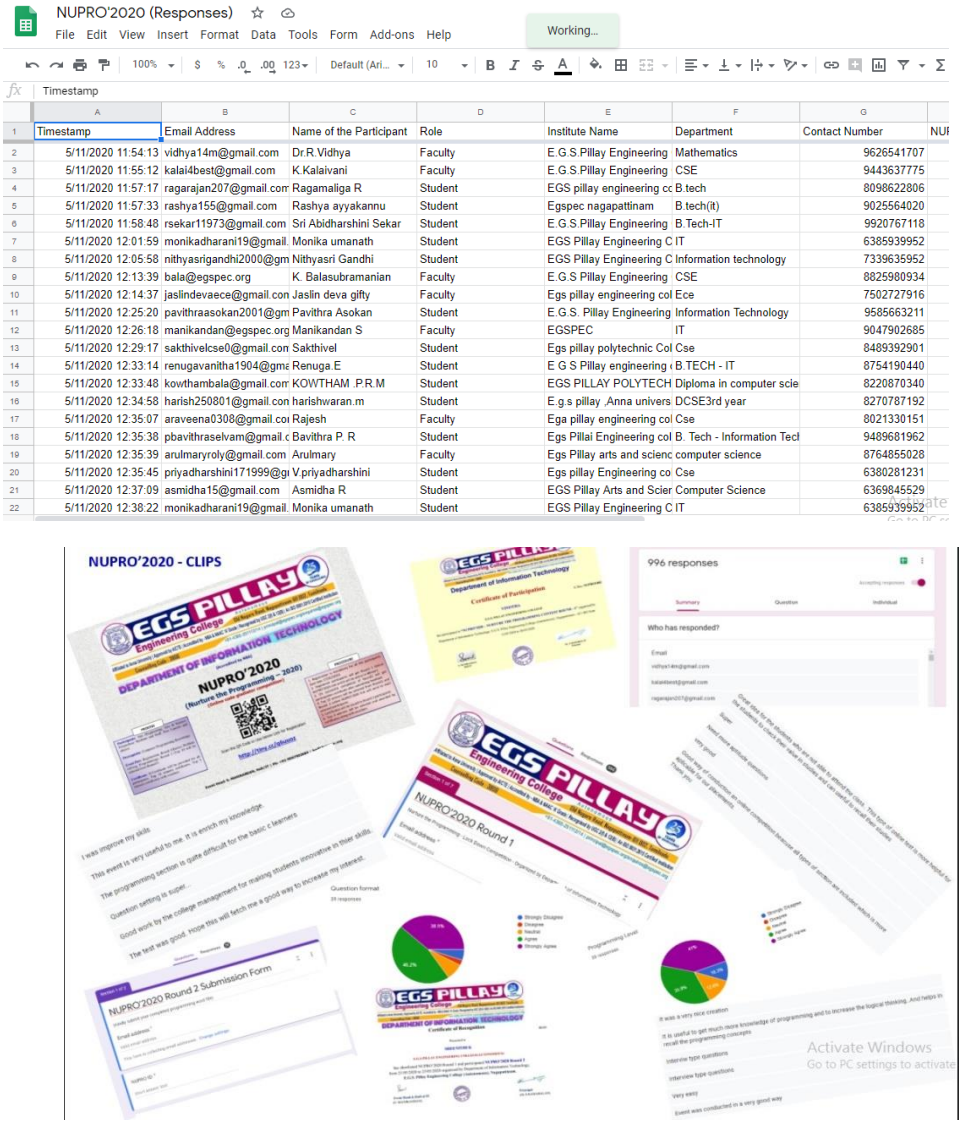


Figure 3 Webinarjam online course registration and response using Spreadsheet

k-means clustering algorithms is applied for dataset. The similar values are grouped based on course details and attributes. Weka 3.8 data science tool is used for clustering. The same cluster are also identified and recorded as version model. The Euclidean distance is applied for measuring similiariy index.

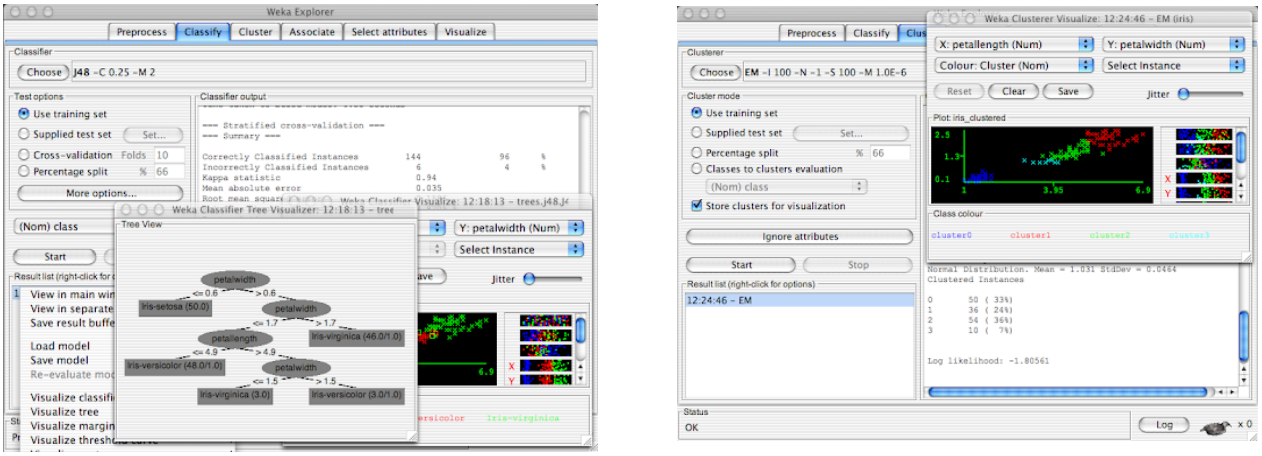
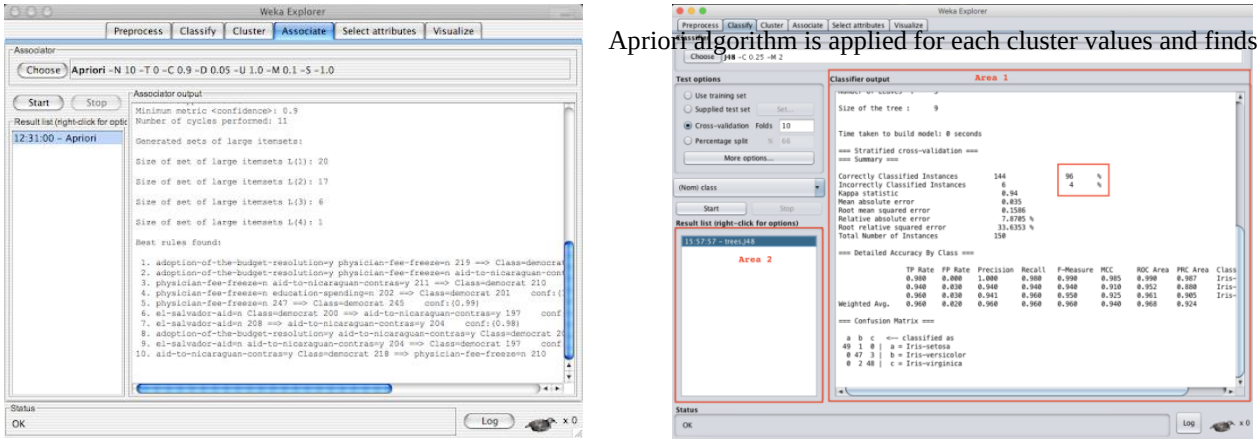


Figure 5: K-means clustering results using Weka tool



Apriori algorithm is applied for each cluster values and finds the course p

Table 3. Result for after applying association rule mining support and confidence value

Course ID	Course Details	Registered Details	Support	Confidence	Coverage	Without Clustering	With Clustering
NUPROx	Programming	12000	0.01	0.01	0.02	0.453	0.345
NDTA	Designing	10000	0.01	0.01	0.05	0.546	0.453
Python	Programming	5000	0.01	0.01	0.15	0.762	0.426
Yoga	Meditation	23000	0.01	0.01	0.10	0.912	0.725
CourseX	Event	34000	0.01	0.01	0.15	0.982	0.837

The above table 2 shows that association rule mining results with and without clustering results using TensorFlow. The similar courses are grouped and reduce the computation time. If multiple courses are selected by single learners means that also grouped. Based on clustering we can easily fix support and confidence values.The performance can be analyzed by using accuracy and prediction with respect to time and precision.

Accuracy = (Tp +Tn) / (Tp + Tn + Fp +Fn) and Precision = Tp / (Tp +Fp)

Whereas, Recall = Tp / (Tn+Fn) so

Prediction_Factor = (2 x Recall x Precision) / (Recall + Accuracy + (Precision)

P and N – Positive and Negative factor of dataset values for support and confidence values. The performance is compared with various existing methods by using support and confidence factor as 0.01.

Table 4. Comparison table with various factors using models

Model	Accuracy	Precision	Recall	Prediction Factor
Network Model	0.56	0.61	0.76	0.45
SVM classification	0.75	0.78	0.65	0.47
Cluster Group	0.81	0.78	0.81	0.67
Kernel Space	0.67	0.92	0.92	0.55
Granular Model	0.75	0.98	0.67	0.72
Proposed Model	0.34	0.54	0.55	0.87

The above results is taken as single dataset input and compared the results using various model. Our method has good accuracy factor as 87% and compared with existing model it is good.

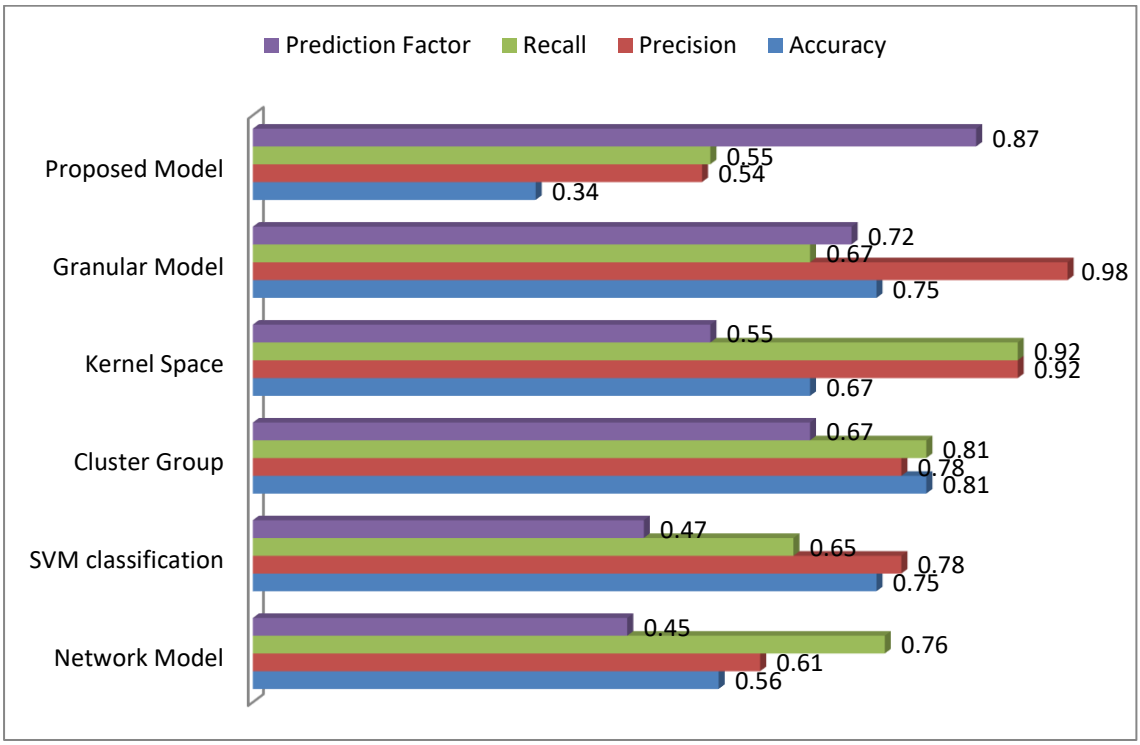


Figure 4: Proposed model prediction factor

5. Conclusion

In this paper, we used intelligent and deep learning method for calculating prediction factor of online learning platforms. The similarity factor is calculated and clustering method is applied for grouping the same groups. The association rule mining is used for finding support and confidence factors. In our experiments, we used Google TensorFlow for analyzing the performance and compared the results with existing methodology. The prediction accuracy factor rate is achieved as 87% and it is high compared with other model. The results are accounted by using course group, similarity index, assessment and clustering. In future this model can be used for different online portals and social media.

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