

*Research Journal of Computer and Information Technology Sciences* \_\_\_\_\_\_ Vol. **5(4),** 6-8, June (**2017**)

## Short Communication

# **Computational models for performance prediction**

**Jyoti Upadhyay<sup>\*</sup> and Pratima Gautam** AISECT University, Bhopal, MP, India upadhyaya.jyoti@gmail.com

**Available online at: www.isca.in** Received 8<sup>th</sup> April 2017, revised 9<sup>th</sup> June 2017, accepted 18<sup>th</sup> June 2017

## Abstract

In today's era citizens have lots of option to learn in term of education. Before join any stream it is necessary to understand that how much a course is suitable for candidate or a student. It is necessary for candidate itself, for instructor or teacher, for organization and for society also. Performance in education field is not only depends upon intellectuality but also it affected by many more elements of circumstances. In the work trying to show which factors other than indulgency can affect the performance and how much they are correlated to each other. For accomplish work prediction method, decision tree, fuzzy data used.

Keywords: Computational, Models, Performance, Prediction.

#### Introduction

In research field there are voluminous studies in the learning area, which investigated the ways of applying data mining for various educational purposes. One of the concentrations of these studies is to identify factors, which may affect the performance of students.

Pawel Bujnowski and others<sup>1</sup> construct a new classifier called an intuitionist fuzzy decision tree. In which data is used to evaluate the performance of the classifier. They compared result to some other popular classification algorithms and, the classifier behavior is verified by a real-world classification problem. They presented and tested an extension of the fuzzy ID3 decision tree algorithm, namely, a new intuitionist fuzzy decision tree. The new classifier was tested on real-world data examples giving very encouraging results.

Sonia Joseph and Laya Devadas<sup>2</sup> present a classification model based on decision tree approach to predict student's academic performance. This method is useful in identifying those students who are probable to fail in the semester examinations and allow the teachers to provide appropriate assistance in timely manner. It also helps the weaker students to improve and bring out betterment in the result. They model a modified ID3 weighted decision tree. According to experiment accuracy comparison is C4.5 45.8333%, ID3 52.0833%, CART 56.25%, MODIIED ID3 76%.

According to Bansode Jyoti<sup>3</sup> state that using decision tree student's performance can be predicted. The students, whose performance is poor, can be warned. The management can take necessary action to improve their performance by giving more attention, taking extra lectures etc. Due to such measures student performance can be improved. The number of failures can be reduced.

### **Prediction model**

Presented Models based is based on fuzzy decision tree. With the help of fuzzy sets and fuzzy logic get an emblematic framework for knowledge clarity<sup>4</sup>. A fuzzy decision tree has significance over conventional decision trees is that; they use excruciating standards, which is based on fuzzy boundaries and the fuzzy sets representative the distinct data.

Acknowledge representation system can be present by data set with some circumstance elements and one decision attributes like J=(U,C UD). Where U represent data samples set, C={c1,c2...,cn} is condition attributes group. D={d}is the oneelemental set with the conclusion attribute or. Suppose this class label characteristic has m distinctive values and defining m distinct classes, di (fori=1,...,m). For a given subset Sj, information ains expressed as

 $I(s_{1j},...s_{mj}) = -\sum m p_{ij} \log 2 p_{ij}$ 

So information gain of attribute  $c_i$  is given by Gain ( $c_i$ ) = I ( $s_{ij}$ ,...smj) – E( $c_i$ )

The attribute which has maximum information gain is the most instructive attribute of the given data set.

A complete explanation of the model can be found in $^{4,5}$ .

However, classification of data acts in adequate. The primary goal of the paper is to demonstrate best model for to determining factors, which are influencing the performance levels of students. In work presenting two models one without fuzzy set and with fuzzy decision tree to show which model predict with high accuracy. Table-1 shows label class accuracy of model that was experimented on 200 data. The true positive rate is 70%. Table-2 shows Accuracy information about the model in that correctly classified model is 79%.

Class label	TP Rate	FP Rate
Yes	0.704	0.000
NO	1.000	0.296

Table-2: Accuracy	Information	of C4.5.
-------------------	-------------	----------

Correctly Classified Instances	110	79.7101 %
Incorrectly Classified Instances	38	29.2307%

Whereas when applying fuzzy decision tree model on data then confusion matrix shows 99% accuracy of model and classification error is 0.89% (Figure-1). In this model selection process for node of fuzzy decision tree depends upon weight, calculated by chi-squared statistic.

## PerformanceVector

Performa	inceVecto	or:		
accuracy	: 99.11%	5		
Confusio	nMatrix:			
True:	Fail	Pass		
Fail:	61	1		
Pass:	0	50		
classifi	cation_e	error: 0.89%		
ConfusionMatrix:				
True:	Fail	Pass		
Fail:	61	1		
Pass:	0	50		
kappa: 0	.982			
Confusio	onMatrix:			
True:	Fail	Pass		
Fail:	61	1		
Pass:	0	50		
weighted_mean_recall: 99.02%, weights: 1, 1				
ConfusionMatrix:				
True:	Fail	Pass		
Fail:	61	1		
Pass:	Ø	50		
weighted_mean_precision: 99.19%, weights: 1, 1				
Confusio	onMatrix:			
True:	Fail	Pass		
Fail:	61	1		
Pass:	ø	50		

#### Figure-1: Accuracy of Fuzzy decision tree.



Figure-2: Comparison with different used methods.

## Conclusion

Paper analyzing the experiments and results of the abovementioned studies, and the prominent inferences is that fuzzy decision tree with weight proves to be an excellent algorithm for the application of predicting student performance in an academic setting. Further several factors contribute to a student's performance, apart from previous academic performance. Figure-2 shows weighted fuzzy decision tree accuracy wise give better performance. Base paper used non weighted decision tree which gave 75.145% accuracy in work it also shows with one of model with different attributes which near about similar and weighted fuzzy decision tree gives 99% accuracy.

### References

 Bujnowski Pawel, Szmidt Eulalia and Kacprzy Janusz (2015). An Approach to Intuitionist Fuzzy Decision Trees. 16th World Congress of the International Fuzzy Systems Association (IFSA) 9th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT), ISBN (online): 978-94-62520-77-6, 1253-1260.

- 2. Joseph Sonia and Devadas Laya (2015). Student's Performance Prediction Using Weighted Modified ID3 Algorithm. International Journal of Scientific Research Engineering & Technology (IJSRET), ISSN: 2278–0882, 4(5).
- **3.** Bansode Jyoti (2016). Mining Educational Data to Predict Student's Academic Performance. *International Journal on Recent and Innovation Trends in Computing and Communication*, ISSN: 2321-8169, 4(1).
- 4. Upadhya Jyoti and Gautam Pratima (2016). Role of Fuzzy Set in Students' Performance Prediction IOSR. *Journal of Computer Engineering* (IOSR-JCE), e-ISSN:2278-0661, 18(2), 37-41.
- Upadhyay Jyoti and Gautam Pratima (2016). Effect of Numerous Data Sets on Performance Prediction. *International Journal of Computer Applications*, ISSN: 0975-8887, 147(5).