Prediction of Education Performance using Deep Learning

S.Ganesh Kumar, G.Harshavardhan Reddy

Abstract: Among all the sectors educational sector plays major role which is used to increase training by observing understudies execution and endeavoring to comprehend the understudies' learning. By collecting marks from the students toward the finish of the semester, at any point they have the issue of not profiting the understudies that have officially taken the course. To get advantage for the present students an input ought to be given progressively and tended to continuously. This would empower understudies and instructors to address educating and learning issues in the most valuable manner for the understudies. Dissecting understudies' execution utilizing information mining strategies can distinguish the understudies' sure or negative actualities, or significantly progressively refined exhibitions, that understudies have towards the present educating. In this paper this we examine a student's performance act by considering profound learning procedure calculations CNN.

Keywords: Student performance prediction, Deep learning for education, neural networks.

I. INTRODCUTION

Since past years there has been a heavy growth in higher education system. Many institutions have establishes in public and private sector by providing so many courses for under graduating and post graduating students. The rates of registration for higher education have also improved but not as higher institutions are increasing. It is a concern for today's education system and this gap has to be identified and properly addressed to the learning community. So it is very crucial to understand the need of students and their academic results.

Educational Data Mining is the application of Deep learning techniques on educational system. The aim of EDM is to analyze the data and to sort out educational research problems. EDM works on improving new methods to enhance the educational data by using Data Mining methods for better understanding student learning environment [1-4]. The EDM is the method which will converts the data coming from the educational systems into the useful data which is potentially has high influence on educational systems. Educational Data Mining researchers applied in various sectors involving single learning from educational application, computer supportive collaborative learning system and the elements which are related with the student failure or non-retention in courses [6,8].

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Past years has shown the improvement in interest in various countries regarding the issue of post-graduation admissibility and the determination of its contributing elements. This issue referred as the "the one hundred factors problem" and major deal of research has completed on discovering the elements which will influence the enrollment of post graduate students. Data mining, normally defined as the method of identifying specific patterns in huge quantities of data, which will provides a variety of techniques, methods and tools for thorough analysis of available data in various sectors. The implementation of data mining in the educational field has defined as "educational data mining" (EDM) [1], is a new branch in the data mining research sector. The educational data mining research community growth started by forming workshops from 2004, then organizing an yearly International Conference on EDM beginning since 2008, and now already having a Journal on EDM (the first issue being published in October 2009). Already there may researches which are discussing about various issues within the higher education sector and providing examples for successful answers reached by using data mining. Extensive literature surveys of the EDM investigate field are given by Romero and Ventura in 2007 [1], covering the exploration endeavors in the region somewhere in the range of 1995 and 2005, and by Baker and Yacef in 2009 [2], for the period after 2005. The issues that are regularly pulling in the consideration of scientists and turning into the purposes behind starting information mining ventures at advanced education organizations are centered chiefly around maintenance of understudies (by better knowing their eccentricities and needs, and by giving appropriate help ahead of time), progressively compelling focused on advertising, improving institutional proficiency, and graduated class the executives of instructive information mining.

Students performance getting horrible day by day in the current educational system. Predicting student performance in advance can help teachers to observe result of a student. Various institutes adopted supportive evaluation system today. Those are profitable for enhancing performance of a student. The aim here is to help regular students.

From decades, Neural Networks has spread globally and evaluations in high length of data mining methods, few surpassing other classifiers. The goal of it is to examine if Neural Networks are a fitting classifier to predict student performance from Learning Management System data in the context.

To evaluate the relevance of Neural Networks, we look at their prescient execution on six different classifiers on this dataset.

These classifiers are Naive Bayes, k-Nearest Neighbors, Decision Tree, Random Forest algorithm, Support Vector Machine classifier and Logistic Regression will be prepared on information acquired amid every course. Highlights utilized for preparing begin from LMS information acquired amid the length of every course, and range from utilization information like time spent on the course page, to grades got for course assignments. In wake of preparing, the Neural Network beats every one of the six classifiers as far as exactness and is keeping pace with the best classifiers regarding review. Mainreason is that Neural Networks beat the six different calculations tried on dataset and effectively utilized to foresee understudy execution.

II. BACKGROUND

In earlier years online education system has developed in an efficient way and also research has applied on it as shown in the figure. These techniques will deliver the benefit teachers as well as students and they has the capacity to share the information anywhere in the world. Amrieh, et al. has worked on prediction for students presentation depending on data mining methods using special characteristics which are called student's behavioral characteristics. The method has examines in three different classifiers called as Naïve Bayesian and Decision tree. Random Forest, Bagging and Boosting were used as ensemble methods to increase the classifier's performance. It has aimed up to 22.1% accuracy when compared with behavioural characteristics.The classifiers family concentrates on the , Neural The classifiers family focuses on the , Neural systems, have demonstrated a few outcomes in spaces like discourse acknowledgment (Graves &Jaitly, 2014), PC vision (Venugopalan et al., 2014), perceiving music (Costa, Oliveira, and Silla, 2017), playing complex diversions like GO (Wang et al., 2016) and financial guaging (Nametala, Pimenta, Pereira, &Carrano, 2016), however the utilization in EDM has been constrained contrasted with the characterization calculations (Baker &Inventado, 2014). This can be halfway disclosed by the intricacy for organizing accommodation in all bundles which are extremely simple to use (Gaur 2012). be that as it may, they will discover benefits on the AI calculations. these sort of properties suits for the EDM where the information, given the way that it is depending up on human conduct, can be hard, and it might comprises of unusable sections just as non straight relations.

III. RELATED WORK

Decision tree is valuable arrangement and relapse method. Decision Trees are incredibly versatile, clear, and easy to explore. They will work with characterization issues and relapse issues [4]. So on the off chance that you are attempting to anticipate a straight out worth like (red, green, up, down) or in the event that you are attempting to foresee a persistent quality trees, decision trees will handle both issues. a decent aspect regarding Decision Trees is they just need a table of information and they will assemble a classifier specifically from that information without requiring any in advance configuration work to occur

Random tree algorithm is more exact than the decision tree algorithm. One vital part of RDTs is that the structure of an arbitrary tree is built totally autonomous of the preparation data[9]. The RDT calculation can be broken into two stages, preparing and arrangement. The preparation stage comprises of building the trees) and populating the hubs with preparing example information Opinion Miner[5]. In this mining process, the tweets are crawled from Twitter and nce the opninion tweets were extracted then it classified the tweets for future process. The main idea of classification is to categorize the tweets in different areas, categories of text data has its special terminology and common representation, and thus we hope that through text classification the overall accuracy rate can be improved. Training data of different categories are then used to build classifier Short Text Classification[6], The intrinsic idea of this part is that we observed that a word may have different meanings in different domains. So the Naïve Bayes classifier method is used together with the pre-labeled training data to form multi-classifier. We use distinct categories of training data. However, since for unigram features, there are normally various features, and as such it is helpful if we discard some useless features. In order to solving this problem, we try two different feature selection algorithms. The first is information is the idea of mutual information is that, for each ans every class C and each feature F, there is a target to count how much F can contribute to making a correct decision on class C.

The Naive Bayes classifier is a straightforward probabilistic classifier which depends on Bayes hypothesis with solid and innocent self-government suspicions. It is the most essential content arrangement system with different applications in email spam presentation, private mail sorting, record classification,, dialect disclosure and estimation revelation. Innocent Bayes executes well in numerous troublesome certifiable inconveniences. the fact is that much of the time beat by different patterns, for example, max entropy, Support Vector Machines and so on, Naive Bayes classifier is amazingly productive since it is less computationally and it requires a little measure of readiness data. One all around delighted in way to deal with execute multi-mark classifier is to change over the multi-name affiliation issue into various single-name order issues [7] Binary grouping presents two distinctive sort of classes for speaking to parallel arrangement and multiclass characterization. Both paired arrangement and multiclass characterization are single-mark order frameworks. Single name arrangement implies every datum point can just fall into one class where all classes are commonly exclusive[8]. Most existing examinations found on tweet course of action are either combined request on significant and immaterial substance, or multi-class gathering on non explicit classes, for instance, news, events, assumptions, game plans, and private messages. Thought examination is another astoundingly pervasive three-class game plan on positive, negative, or fair emotions/suppositions. Inclination examination is useful for mining customer evaluations on

things or associations through their overviews or online posts. It finds wide selection in showcasing and client relationship administration. Numerous systems have been created to mine feeling from texts. However, just knowing the slant of understudy posted tweets does not give much noteworthy learning on important mediations and administrations for understudies.

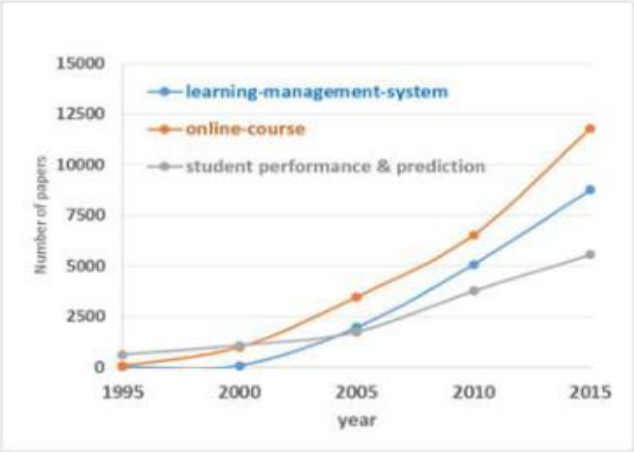

Fig. 1 Number of papers in educational data mining related fields

IV. METHODOLOGY

Student Performance Prediction using neural networks

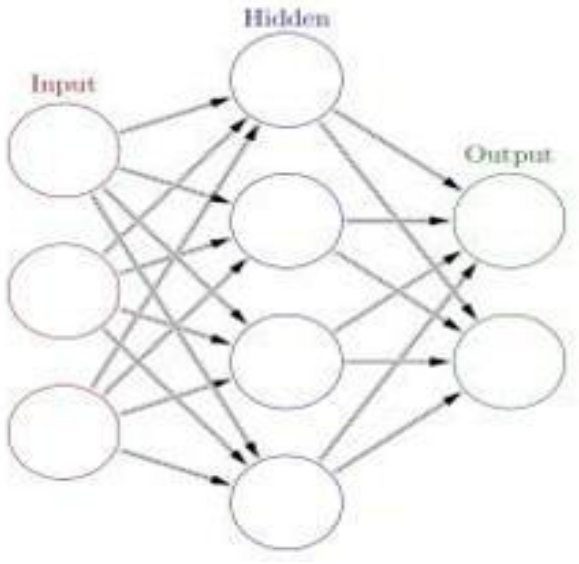

Fig. 2 Structure of neural network

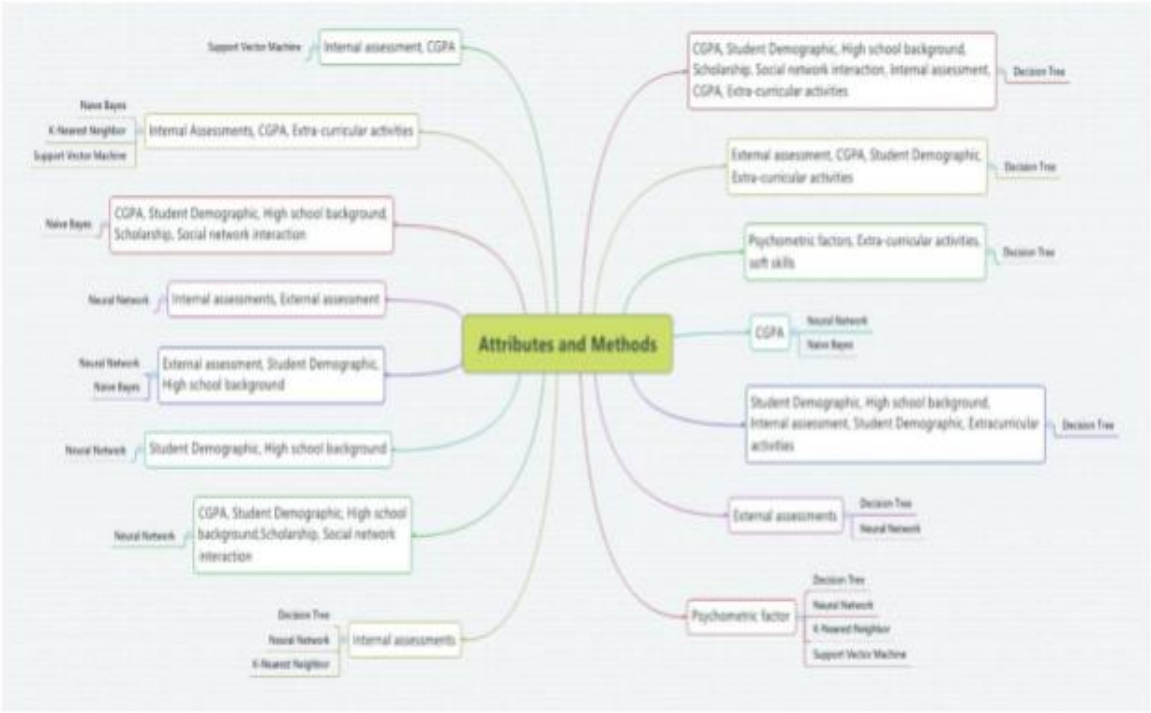

Fig. 3 List of common attributes and methods used in predicting student's performance [2]

This investigation focuses on to anticipate understudy execution which is identified with the group of Neural Networks. These calculations impersonate that how our cerebrum functions. It consists of variety of interconnected hubs will trade data among one another (see Figure 2), practically identical to the way our neurons, associated by dendrites and axons, trade data. They will see the arrangement after some time by watching various precedents, in the same way how youngsters will take in aptitudes from their folks by perception. In any case, dissimilar to youngsters that can learn perceive and after watching it once, Neural Networks regularly needs more prominent arrangement of perceptions for achieving adequate prescient limit. Here we have demonstrated the means to extricate the indicators are clarified and the preparation procedure and parameters for the classifiers are cleared up.

Students Dataset		
Name	**Data Type**	**Distinct Values**
Gender	Nominal	2
Nationality	Nominal	14
Place of Birth	Nominal	14
Stages	Nominal	3
Grades	Nominal	12
SectionID	Nominal	3
Topic	Nominal	12
ParentResponsible	Nominal	2
Semester	Nominal	2
Raised hand	Numeric	0-100
Visited Resource	Numeric	0-100
Viewing Announcement	Numeric	0-100
Discussion Group	Numeric	0-100
Parent Answering	Nominal	2
Parent Satisfaction	Nominal	2
Student Absent day	Nominal	2

Fig. 4 Dataset attributes

Experimental Design

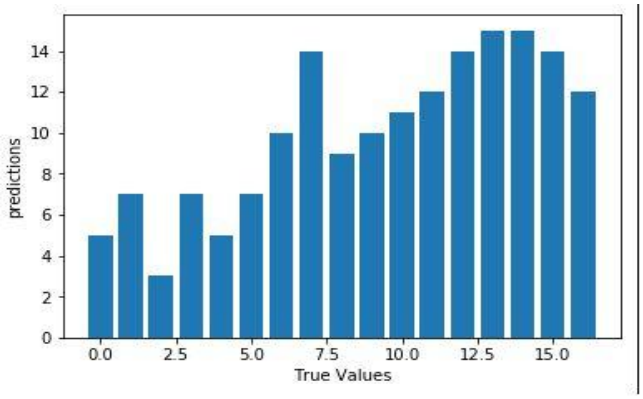

Fig. 5 Prediction and true values

Here we have the graph between prediction and true values.

Here, we need to configure Deep Neural Network straight classifier method to anticipate execution of understudies. This procedure ought to be pursued when dataset is preprocessed: information cleaning and information change. The DNN model developed by using python3 and tensor flow 1.3.0.artificial neural networks (ANNs) are parallel computational methods contained thickly interlinked, versatile preparing units, explained by a natural penchant for gaining for a fact and finding new information. Because of their magnificent capacity of self-learning and self-adjusting, they have been widely examined and used effectively (Bishop 1995; Haykin 1999) and few times they are observed to be increasingly exact and exceptionally proficient. Arrangement with a neural system happens in two unique stages. To start with, the system is prepared on a lot of combined information to clarify the info yield mapping. The loads of association with neurons are then system is utilized to investigate arrangements of another arrangement of information. Albeit a wide range of models of ANNs has proposed, the feedforward neural systems (FNNs) are well-known and used in assortment of use dataset as preparing dataset and it is orchestrated this dataset to explain a session testing informational index for characterizing the outcomes.

V. EXPERIMENTAL STUDY

In order to evaluate the performance of deep neural networks in order to evaluate the prediction accuracy, first we consider a dataset as training data set and it organized this training data set to determine the testing data set for classifying results.

VI. CONCLUSION

Through the evaluation about recent student performance analysis works especially on educational purpose, this paper has identified and emphasized four important research problems. Through the proposed whole CNN methodology for education namely, student performance prediction system, this study has fulfilled the identified research problems with satisfactorily experimental results.

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