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Early Prediction of Student Result by Using Machine Learning Algorithm

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Abstract:
In the university of Technology and Applied Sciences (UTAS), some students are registered the courses but they are not attending the classes and quiz exams. If we monitor these student's performance, they will get fail mark in that course. Moreover, they will not withdraw the courses also. These kinds of students will get less CGPA and they will not get job also. In our project, we use machine learning algorithm to predict the students result earlier. So, we can focus on those students who got fail marks in the early prediction. And we can inform to their parents to concentrate on their child's education. By taking all action we can make the student to concentrate on his / her studies to get good CGPA and Job.

Keywords: Prediction, ANN, Student Result

I. INTRODUCTION

This machine learning model is used to predict the student result after their quiz marks. If we predict the students result after their quiz mark then we can take necessary action to particular students. We can conduct some tutorial classes and we can inform to their parents to take care about their children. In this model, we have to give attendance percentage and quiz marks as a data set. The machine learning model will predict the student result. We can collect student's information from college. We can collect 1000 student's data. In that 900 will consider as training data and 100 will consider as testing data. If we not get sufficient accuracy level then we can increase the training and testing data. The primary goal of this project is predicting the student result earlier and take the necessary steps to improve the performance of the students in their studies.

II. LITERATURE SURVEY

In this paper author presents the findings of a two-year study with foundation (level 3) student attendance and performance. Learning analytics has become a popular term within higher education and there are several dashboard applications available for institutions to invest in. There has been an increase in attendance monitoring activity across the higher education sector to monitor the student's performance. Some dashboards merge attendance monitoring with other learning analytics data to provide reports and in some cases encourage better engagement by students. The drivers and outcomes linked to such monitoring may be different in different institutions. At Portsmouth, the School of Engineering developed a bespoke in-house attendance monitoring system and has been carrying out research looking at the

benefits of such a system for staff and students. Quantitative data was used from the attendance monitoring system along with course specific data collected in previous years before the introduction of the system to evaluate progression.

This paper highlights some challenges faced during the implementation of the attendance monitoring trial system with the School of Engineering and presents some observations on the effects that attendance monitoring had on the progression and achievement of students. [1]

In this paper author provide a study of a fingerprint recognition system based on minutiae-based fingerprint algorithms used in various techniques. This line of track mainly involves extraction of minutiae points from the model fingerprint images and fingerprint matching based on the number of minutiae pairings among to fingerprints. It also provides the design method of fingerprint-based student attendance with help of GSM. This system ignores the requirement for stationary materials and personnel for keeping of records. The main objective of this paper is to develop an embedded system, which is used for security applications. The biometrics technology is rapidly progressing and offers attractive opportunities. In recent years, biometric authentication has grown in popularity as a means of personal identification in college administration systems. The prominent biometric methods that may be used for authentication include fingerprint, palmprint, and handprint, face recognition, speech recognition, dental and eye biometrics. In this paper, a microcontroller-based prototype of attendance system using fingerprint sensor and face recognition module is implemented. The tracking module is used here to identify the location of the missing person. [2]

In this paper authors developed Applications specifically for supporting Learning Management Systems (LMS) have been deemed effective when used in distance and hybrid teaching models. They are especially attractive and powerful aids in geographical areas where access is difficult, as in small communities and towns within the Brazilian Amazon Forest. As the use of these systems brought changes in the teaching-learning process, monitoring and tracking of student performance also had to be rethought. This paper presents the development of a plugin LMS Monitor tool to aid educators in academic performance analysis of students in LMS Moodle. The tool is intended to collect indicative data of student access to, and participation in virtual classrooms environment and activities. In an initial case study at the Federal University of Amazonas (UFAM/Brazil), the LMS Monitor was made available to educators in two hybrid learning model courses. The usability and practicality of the tool were evaluated using TAM (Technology Acceptance Model) with Likert scale. Evaluation results indicated that LMS Monitor is an effective support aid to educators in the pedagogical monitoring and performance analysis of students, significantly contributing to improve student retention and promotion rates. [3]

III. PROPOSED SYSTEM

In this section, the hardware and software system design of the proposed system will be discussed. The following Figure 3.1 shows the proposed system architecture. Units, or artificial neurons, are components of artificial neural networks. The Artificial Neural Network of a system is made up of these units grouped in a sequence of layers. The number of units in a layer can range from a few dozen to millions, depending on how many complicated neural networks are needed to uncover the dataset's hidden patterns. Artificial neural networks typically consist of hidden layers, output layers, and input layers. The input layer is where external data is fed into the neural network for analysis or education. After that, the data goes via one or more hidden layers, which convert the input into useful data for the output layer. Lastly, the Artificial Neural Networks' reaction to the supplied input data is presented as an output by the output layer.

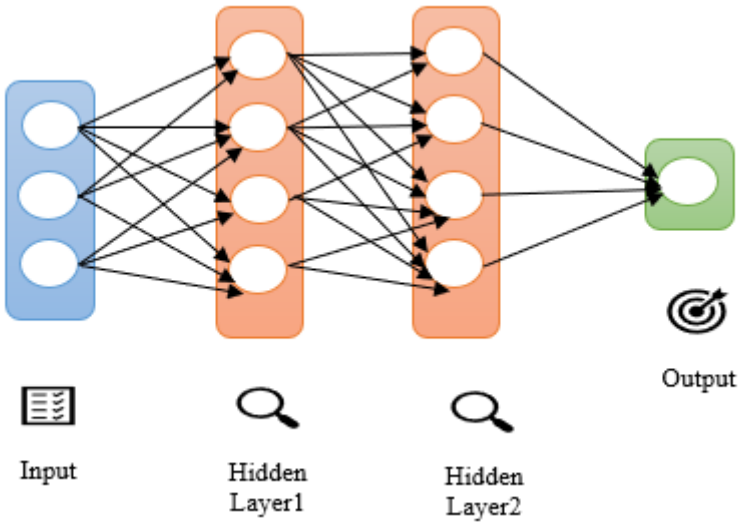

Figure 3.1 Proposed System Architecture

Units are connected from one layer to another in most neural networks. The weights assigned to each of these relationships indicate how much effect one unit has upon the others. The neural network gains more and more knowledge about the data as it moves from one unit to the next, ultimately producing an output from the output layer. Artificial neural networks are based on the architecture and functions of human neurons. Neural nets or neural networks are other names for it. An artificial neural network's first layer, known as the input layer, transfers data from outside sources to the second layer, known as the hidden layer. Each neuron in the hidden layer takes in information from the neurons in the layer above, calculates the weighted sum, and then relays it to the neurons in the layer below. Because these connections are weighted, the effects of the inputs from the preceding layer are essentially optimized by giving each input a unique weight, which is then modified during training to improve model performance.

A training set is used to train artificial neural networks. Let's say you wish to train an artificial neural network (ANN) to identify a cat. In order to train the network to recognize a cat, thousands of different cat photos are then displayed to it. You must verify that the neural network can accurately identify cat photographs once it has had sufficient training with cat images. In order to accomplish this, the ANN is trained to classify the given images by determining whether or not they are images of cats. An explanation of whether or not the image is of a cat supplied by a human validates the output produced by the ANN.

We must comprehend what makes up a neural network before we can comprehend the idea of an artificial neural network's architecture. To describe a neural network made up of many artificial neurons, also known as units grouped in a layer-by-layer fashion. Let's examine the different kinds of artificial neural network layers that are available.

Input Layer:

As the name implies, the programmer can submit input in multiple forms for it to accept.

Hidden Layer:

Between the input and output layers is where the hidden layer is displayed. It does all the computations to uncover hidden patterns and features.

Output Layer:

Using the hidden layer, the input undergoes a number of modifications before being relayed through this

layer as output. After receiving input, the artificial neural network calculates the weighted sum of the inputs and adds a bias. A transfer function is used to express this computation.

Because of their architecture, artificial neural networks require computers with parallel processing capability. As a result, the equipment's realization is dependent. Numerical data can be processed by ANNs. Prior to being introduced to an ANN, problems must be transformed into numerical values. The network's performance will be directly impacted by the presentation method that needs to be fixed. It is dependent on the user's skills. The network is narrowed down to a particular error number, and this value does not provide the best outcomes.

IV. RESULTS AND DISCUSSION

The 293 students' data are input of this model. In this data, 80% of the data are considered as training data and 20% of the data are considered as testing data. The data has been trained in the model and predicted the student result.

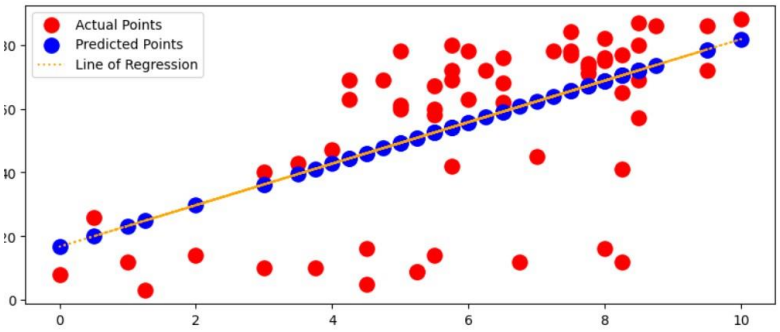

Figure 4.1: Prediction of student Result

	A	B	C	D	E	F	G
1	QUIZ	FINAL					
2	7	59					
3	7.5	76					
4	7.25	73					
5	6.5	57					
6	7.25	15					
7	8.75	86					
8	8.75	24					
9	7.5	77					
10	8	76					
11	7.5	18					
12	8.5	83					
13	8	64					
14	5.5	58					
15	8.25	80					
16	9.5	70					
17	8.5	80					
18	5.5	57					
19	7	83					
20	8	87					
21	8	64					
22	8.5	79					
23	7.5	76					
24	6.5	68					
25	7.5	84					
26	8	81					
27	9	75					

Figure 4.2: Sample Dataset

VI. CONCLUSION

This system will predict the final mark of the student based on the quiz mark. This prediction is very useful for monitoring the performance of the student. The accuracy level of the model can be increased by applying another machine learning model in future. The accuracy level will vary based on the input data. So we have to select the real time input data.

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