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A Novel Ai Driven Model For Student's Result Prediction

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Abstract:

Some students are registered for courses at the University of Technology and Applied Sciences (UTAS), but they do not show up for class or quizzes. These students will receive a failing grade in that course if their performance is tracked. Furthermore, they will not cancel the classes either. Students of this type will receive lower CGPAs and be less likely to find employment. We employ machine learning algorithms in our project to forecast students' outcomes in advance. We can therefore concentrate on the pupils who received failing grades in the early prediction. Additionally, we can advise their parents to focus on their child's schooling. By doing everything possible, we can encourage the students to focus on their studies in order to get a high CGPA and land a job.

Keywords: **Prediction, ANN, Student Result**

I. INTRODUCTION

Following quiz scores, the student's outcome is predicted using this machine learning model. We can take the appropriate measures for certain pupils if we are able to predict their results after their quiz mark. In addition to teaching some tutorial lessons, we can advise their parents on how to care for their kids. We must provide quiz scores and the attendance percentage as a data set in this model. The student's outcome will be predicted by the machine learning model. Information about students can be obtained from the college. We are able to get data from 1000 students. In that case, 100 will be regarded as testing data and 900 as training data. We can increase the training and testing data if the accuracy level is insufficient. This project's main objective is to forecast student outcomes in advance and take the required actions to raise students' academic performance.

II. LITERATURE SURVEY

The results of a two-year study on foundation (level 3) students' attendance and performance are presented in this report. The term "learning analytics" has gained popularity in higher education, and universities can invest in a variety of dashboard software. In order to keep an eye on students' performance, the higher education industry has increased its use of attendance tracking. Some dashboards combine data from learning analytics and attendance tracking to provide reports and, in some situations, to promote increased student participation. Different institutions may have different motivations for and results from this kind of monitoring. The School of Engineering at Portsmouth created a custom in-house attendance tracking system and has been conducting studies

to examine the advantages of such a system for employees and students. To assess progress, quantitative data from the attendance monitoring system was combined with course-specific data gathered in years prior to the system's launch.This essay outlines some of the difficulties encountered when the School of Engineering's attendance monitoring trial system was put into place and offers some insights into how attendance tracking affected students' development and academic performance. [1]

The authors of this work present an analysis of a fingerprint recognition system that uses minutiae-based fingerprint algorithms in a variety of methods. This line of work mostly entails matching fingerprints based on the quantity of minutiae pairings between two fingerprints and extracting minutiae points from the model fingerprint images. Additionally, it offers the GSM-assisted fingerprint-based student attendance design method. The need for stationery supplies and staff to maintain records is disregarded by this system. The development of an embedded system for security applications is the primary goal of this research. The technology of biometrics is developing quickly and presents appealing prospects. The use of biometric verification for personal identity in college administration systems has become more and more common in recent years. The most common biometric techniques that can be used for identification include facial recognition, speech recognition, dental and ocular biometrics, fingerprints, palmprints, and handprints. This paper describes the implementation of a microcontroller-based attendance system prototype that uses a facial recognition module and fingerprint sensor. Here, the position of the missing individual is determined using the tracking module. [2]

The applications that the authors of this study created especially to support learning management systems (LMS) have been found to be successful when utilized in hybrid and remote learning models. In places where access is challenging, like in the Brazilian Amazon Forest's small villages and communities, they are particularly alluring and effective tools. The teaching-learning process was altered by the deployment of these devices, necessitating a rethinking of student performance tracking and monitoring. The creation of an LMS Monitor plugin tool to assist teachers in analyzing students' academic performance in the LMS Moodle is presented in this paper. The tool's goal is to gather suggestive data about students' engagement in and access to virtual classroom environments and activities. Teachers in two hybrid learning model courses at the Federal University of Amazonas (UFAM/Brazil) had access to the LMS Monitor in an early case study. Using a Likert scale and the Technology Acceptance Model (TAM), the tool's usability and practicality were assessed. According to the evaluation's findings, LMS Monitor helps teachers monitor and analyze students' performance in the classroom, which greatly increases the retention and promotion rates of their pupils. [3]

III. PROPOSED SYSTEM

The design of the suggested system's hardware and software will be covered in this part. The suggested system design is depicted in Figure 3.1. Artificial neural networks are made up of units, sometimes known as artificial neurons. These units are arranged in a series of layers to form a system's Artificial Neural Network. Depending on how many complex neural networks are required to reveal the hidden patterns in the dataset, a layer's number of units might vary from a few dozen to millions. Typically, input, output, and hidden layers make up artificial neural networks. External data is sent into the neural network for analysis or instruction at the input layer. The data then passes through one or more hidden layers, which transform the input into information that the output layer may use. Finally, the output layer displays the Artificial Neural Networks' response to the input data that was provided.

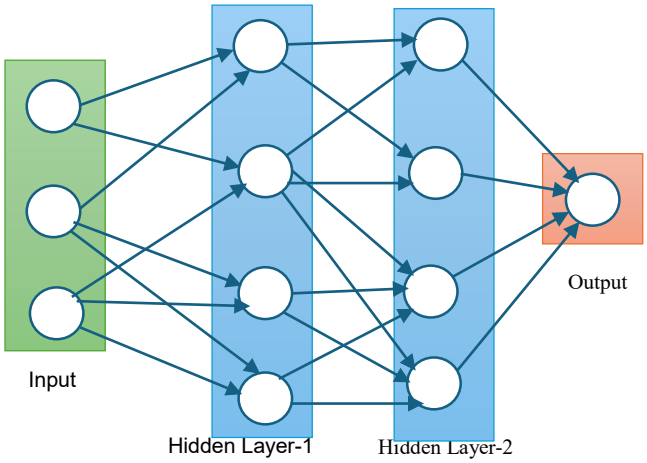

Figure 3.1 Proposed System Architecture

In most neural networks, units are connected from one layer to another. The degree to which one unit influences the others is shown by the weights given to each of these interactions. As it progresses from one unit to the next, the neural network learns more and more about the data, eventually generating an output from the output layer. The structure and operations of human neurons serve as the foundation for artificial neural networks. It is also known as neural networks or neural nets. Data from external sources is transferred to the second layer, called the hidden layer, of an artificial neural network by the first layer, called the input layer. After receiving input from the neurons in the layer above, each neuron in the hidden layer computes the weighted total and sends it to the neurons in the layer below. The weighting of these connections effectively optimizes the effects of the inputs from the previous layer by assigning a distinct weight to each input, which is subsequently adjusted during training to enhance model performance.

Artificial neural networks are trained using a training set. Suppose you want to learn how to recognize a cat using an artificial neural network (ANN). The network is then shown thousands of different cat pictures to train it to recognize a cat. After the neural network has been sufficiently trained with cat images, you need to confirm that it can correctly detect cat photos. To do this, the ANN is trained to identify whether or not the provided images are of cats in order to classify them. The ANN's output is validated by a person providing an explanation of whether or not the image depicts a cat. Before we can understand the concept of the design of an artificial neural network, we must understand what constitutes a neural network. to characterize a neural network composed of several artificial neurons, sometimes referred to as units arranged layer by layer. Let us have a look at the many types of artificial neural network layers.

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:

Before being relayed through this layer as output, the input is subjected to a number of changes using the hidden layer. Following input, the artificial neural network adds a bias and computes the weighted total of the inputs. This calculation is expressed in terms of a transfer function.

Artificial neural networks need processors with parallel processing capabilities due to their architecture. The realization of the equipment is hence dependent. ANNs are capable of processing numerical data. It is necessary to convert problems into numerical values before introducing them to an ANN. The presentation mechanism that needs to be adjusted will have a direct effect on the network's performance. The talents of the user determine this. The optimal results are not obtained when the network is reduced to a specific error number.

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.

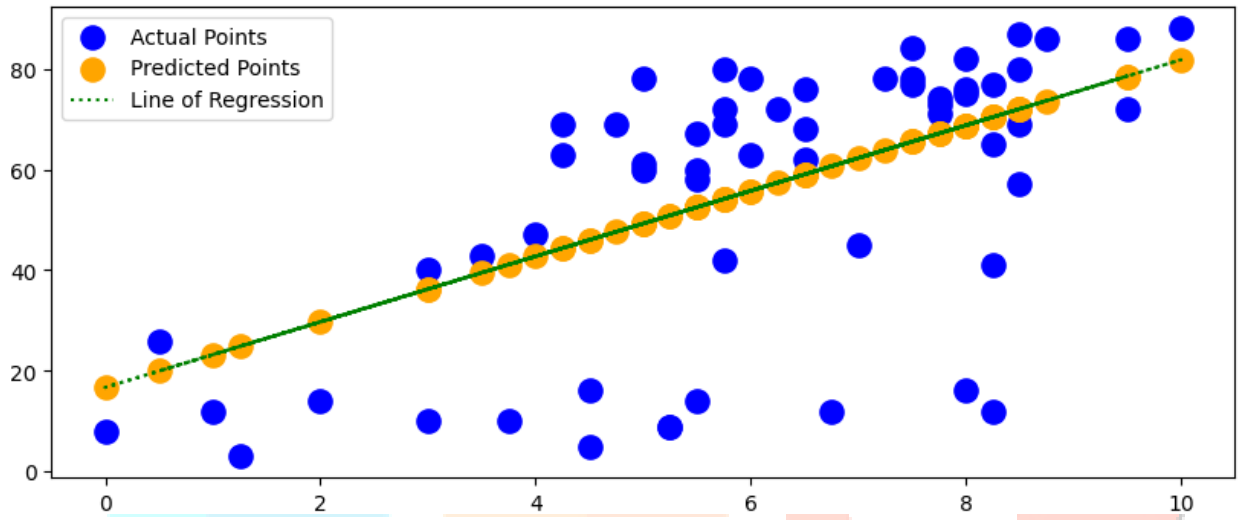

Figure 4.1: Prediction of student Result

	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					
28	9	80					
29	7.5	60					
30	9.5	78					
31	6.5	45					
32	7.5	79					
33	8	76					
34	7.5	74					
35	8.5	80					

CAF

Figure 4.2: Sample Dataset

VI. CONCLUSION

Based on the quiz score, this algorithm will forecast the student's ultimate grade. This forecast is incredibly helpful for tracking the student's progress. Using a different machine learning model in the future can raise the model's accuracy level. The input data will determine the accuracy level. Therefore, we must choose the real-time input data.

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