

Predictive Analysis of Student Stress Level Using ML

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Abstract— Stress Prediction in college students based on their profile and behaviors is a challenging task in current educational sector. Current system is manual process where it is difficult to identify the stress in the college students. There is no automation for students stress prediction. Objectives of the proposed system is an real time application. The model classifies the students into Stress and Stress Free. Proposed system makes use of data science technique “classification rules” for predicting stress in college students. System build using “Visual Studio” as front end technology and “SQL Server” as back end technology.

Keywords: Student Stress Prediction, ML

I. INTRODUCTION

In existing system college students are facing so many mental health problems such as depression, pressure, stress, interpersonal sensitivity, fear, nervousness etc.. Though many industries and corporate provide mental health related schemes and try to ease the workplace atmosphere, the issue is far from control. Stress Prediction in college students is one of the major and challenging tasks in the current education sector. Current system is manual process where it is difficult to identify the stress in the college students. There is no automation for students stress prediction

II. RELATED WORK

An Intelligent Student Advising System Using Collaborative Filtering- We propose a web based intelligent student advising system using collaborative filtering, a technique commonly used in recommendation systems assuming that users with similar characteristics and behaviors will have similar preferences. With our advising system, students are sorted into groups and given advice based on their similarities to the groups. If a student is determined to be similar to a group students, a course preferred by that group might be recommended to the student

Here System used to predict suitable course for students and dataset not compatible to predict student results. Not all student behaviors connected to course advising. Students are grouped and then system predicts the suitable course for the students. Grouping lacks over data for prediction.

III. SYSTEM ARCHITECTURE

An architecture diagram is a graphical representation of a set of concepts that are part of architecture, including their principles, elements and components. An architecture diagram describes what you're building, how stakeholders interact with it, and where constraints lie. The main purpose of architectural diagrams should be to facilitate collaboration, to increase communication, and to provide vision and guidance.

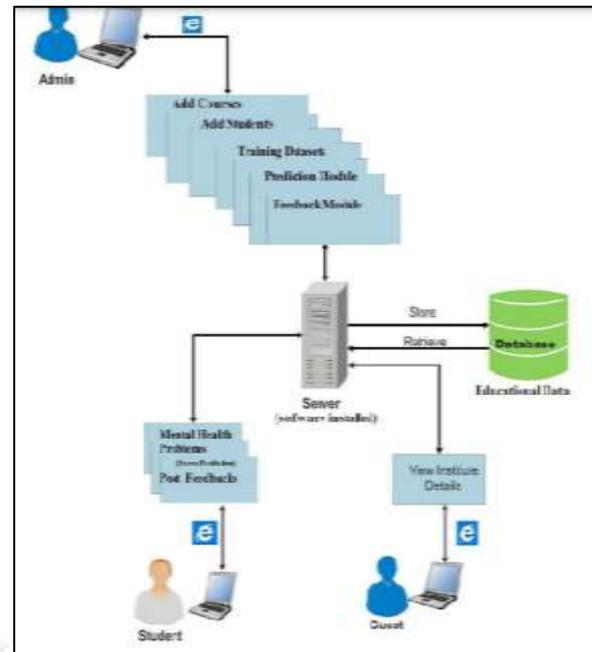


Fig. 1.1: Architecture of Predictive Analysis of Student Stress Level

IV. SYSTEM MODULE

Users and Modules: Project structure shows the flow of the project, which involves users and modules/functionalities of the project.

A. Users

- 1) Administrator -the one who maintains the whole application and the one who has full authority.
- 2) Students - Service receivers and the one who can post any queries to admin.

Administrator has functionalities like “Login Module” here admin gets login to the application by inputting admin id and password. “Add Students” here admin will add all Students of different departments. “Sets Id and Password” here admin will set unique id and password for the individual Student. “Manage Datasets” here admin manages training datasets used in the project. “Import data from Excel Sheet” training datasets stored in excel sheet, here we import data from excel sheet.

“Stress Prediction Module” this is the core module where system finds the stress problems faced by Students. here we use data science technique called as "supervised learning" KNN algorithm.(YES OR NO PREDICTION). Stress Level Prediction (% level) and Result Analysis (accuracy and efficiency) 8.Data Visualization Module (pie, line ...) PREDICTIVE ANALYSIS OF STUDENT STRESS LEVEL USING ML 20 “Queries” admin can view the Students queries and send reply. “Update Profile” admin can update profile. “Sign-out”

Students functionalities; Login Module - here users can get login by specify student id and password. List of Mental Health Problems (prediction module)- can view the list of health problems faced by Students. Input Parameters - here user will upload the parameters used for stress level prediction. Stress Prediction Module - this is the core module where system finds the stress problems faced by Students. here we use data science technique called as "supervised learning" KNN algorithm. Solution Module - here system will find some solutions for the stress problems of Students. Post Queries - can post queries to admin if any Update Profile - can update profile then Sign-out

V. SYSTEM IMPLEMENTATION

Data Collection (Stress Data) - This is the first step in the stress prediction process where we collect stress data. Data collected from many sources which contains parameters such as Gender, Age, Financial_Issues, Family_Issues, Health_Issues, Partiality Fix, Pressure, Regular, Interaction etc...DataPreparation- Here stress data analyzed and only relevant data extracted. The data required for processing extracted and segmented according to the requirement. Required data extraction is done because entire data not required for processing and if we input all data, it requires too much of time for processing, so data processing is done.Specify Constraints Stress parameters used for stress level prediction are fetched. Parameters such as Gender, Age, Financial_Issues, Family_Issues, Health_Issues, Partiality_Fix, Pressure, Regular, Interaction etc.. ML Algorithms - Supervised Learning Supervised learning is an approach to machine learning that is based on training data that includes expected answers. KNN Algorithm and Decision

VI. ALGORITHM

Naïve Bayes Algorithm

- 1) Step 1: Scan the data-set (storage servers) retrieval of required data for mining from the servers such as database, cloud, excel sheet etc.
- 2) Step 2: Calculate the probability of each attribute value. [n, n_c, m, p] Here for each attribute we calculate the probability of occurrence using the following formula. (mentioned in the next step).For each class(disease) we should apply the formula.
- 3) Step3: Apply the formula $P(\text{attributevalue}(a_i) / \text{subjectvalue}(v_j)) = (n_c + m_p) / (n+m)$ Where: n = the number of training examples for which $v = v_j$, $n_c =$ number of examples for which $v = v_j$ and $a = a_i$, p = a priori estimate for $P(a_i|v_j)$.

VII. CONCLUSION AND FUTURE ENHANCEMENT

College students are suffering from many mental health problems including mental stress, somatization, obsessive, interpersonal sensitivity, depression, anxiety, hostility, fear, paranoia and psychosis, which can bring a lot of negative effects to them. Machine learning is a subject to predict future based on the past data. Using machine learning techniques we predict student stress level and also proposed system will give suggestions based on the stress levels of student Future

Enhancements Additional methods like the Naive Bayes classifier can be used to test the efficiency of the model. One can implement deep learning techniques like CNN (Convolutved Neural Networks) and verify how the model performs for the given datasets. A much more specific and vast datasets can be used as a training model since the number of responses is limited in our case.

Tree "KNN Algorithm and decision tree" is used for stress prediction because the algorithm is efficient classifier, works fine for less number of parameters as well as more number of parameters, for small data-set as well as big data-set, more accurate results.

Stress Prediction System predicts the stress based on the parameters using machine learning algorithm. We use 2 different algorithms for stress prediction "KNN algorithm". PREDICTIVE ANALYSIS OF STUDENT STRESS LEVEL USING ML 42 Results- Here we find the accuracy of the algorithm by dividing the training datasets into training and testing datasets. 90% considered as training datasets and 10% considered as testing datasets. Visual Representation Outputs displayed for the users on GUI.

VIII. TEST CASES

TC#	Description	Expected Result	Actual Result	Status of Execution Pass/Fail
TC01	Execute/run the application	Application should run without any interrupts	Application is executing properly	Pass
TC02	Verification of Admin Login Input User Name and Password then click on Login button.	Admin User Name & Password should be check/verify with database.	Admin User Name & Password successfully checked with database.	Pass
TC03	Verification of Input User Name & Password of Admin.	If Admin User Name & Password is valid then it should navigate to respective Admin home page.	Admin User Name & Password is valid then successfully navigating respective home page.	Pass
TC04	Verification of Input User Name & Password of Admin. (Invalid Case)	If Admin User Name & Password is invalid then it should show message that Input Username & Password is wrong.	If User Name & Password is not valid or wrong input then message box shown that User Name & Password wrong.	Pass

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