

Student Feedback System Using Machine Learning

^[1]Dr. Vijaykumar S. Bidve, ^[2]Pratiksha Patwari, ^[3]Rucha Raut, ^[4]Arya Kadam

^{[1][2][3][4]} Department of Information Technology, MMM College of Engineering, Pune, India

Abstract— The study has been carried out to present the student feedback system analysis model for improving the quality of teaching in academics institution and universities. The system mainly presents a combination of machine learning algorithm and textual feedback. In this system has been routed towards student's feedback analysis in the form of comments, opinion, and reviews regarding the performance of teachers. The textual feedback, provides useful insights to the overall teaching quality and suggests valuable ways for improving teaching methodology. The purpose of this study is to explore the different machine learning techniques to identify its importance. The various machine learning techniques involves SVM, Random Forest, Naïve Bayes algorithm and lexical analysis out of which SVM has the best accuracy but takes more time in training for the large dataset and it is used for regression and classification to classify the text. The dataset contains valuable information about the quality of teaching and learning. This work examine the textual comments present in the text document for classification of student's feedback based on polarity that is positive, negative and neutral. The system helps to reduce the manual work and collects the feedback and stores them in a database which can be authorized person. The analysis of the feedback is provided to the teacher in the form of ratings and graphs so the data visualization becomes easier. This system is an efficient approach for providing qualitative feedback for teachers that improves the students learning.

Keywords— Feedback system, SVM algorithm, Machine learning, Naïve Bayes algorithm

I. INTRODUCTION

This paper proposes student feedback system which helps to evaluate the teaching performance. This student feedback system collects student's textual feedback comments and then classify them using SVM algorithm. Once the student submits feedback by login to the portal, the feedback is analyzed through the analyzer. Feedback then classified into a positive, negative and neutral polarity using support vector machine algorithm. This polarity helps to calculate whether the performance is good bad or moderate so that they can improve the way of teaching. The system uses topic extraction and classification to represent the student's views in a graphical way and ratings. The goal of this system is to help teacher to improve method of teaching as per the comments received from feedback. The system is developed to provide feedback in an easy and quick manner to the college principal and head of department (HOD). Teacher can only view their feedbacks which are presented in form of ratings. Department head has power to see all the feedbacks submitted on the department level for every teacher, lab activities and extracurricular. Department head is able to manage laboratory activities and extracurricular in different way or better way which will helps to improve performance of whole department. Also department head hold the power to add, remove staff member. Overall, this system will help to improve performance of department of the college and way of teaching by collecting feedbacks from students.

II. EXISTING SYSTEM

In the existing manual system of student feedback in educational institutions, if the students need to give feedback, they are supposed to submit a feedback application to the concerned head of department. The HOD needs to submit the feedback application to the principal. The process is manual and time consuming.

III. PROPOSED SYSTEM

In the proposed system of Student Feedback, an online feedback which would record the student's feedback and analyze the teacher's performance based on sentiment analysis using SVM classifier and then summarizes the teacher performance. Then classification of feedbacks is taken place and classify them into positive, negative and neutral.

The aim of this system is to take student feedback and analyze the feedback using Sentiment analysis and its various approaches. To achieve the goal of student feedback using Sentimental analysis, various approaches like Lexicon based approach, Machine Learning based approach and also some other methodologies like Transfer learning are used. The system helps to visualize the output of feedback data in various form like rating and graphs.

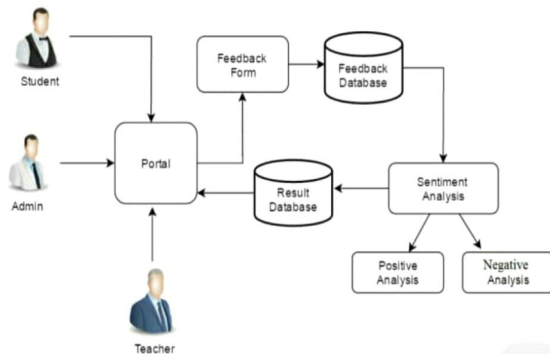


Figure1. System Architecture

Advantages of Proposed System:

- Reduces a lot of time and effort
- Reduces paper work
- Friendly user interface
- Enhances security
- Report generation is made easy and efficient

SVM Algorithm:

Support vector machine analyses the data, define the decision boundaries and uses the kernels for computation which are performed in input space. The input data are two sets of vectors of size m each. Then every data represented as a vector is classified in a particular class. Now the task is to find a margin between two classes that is far from any document. The distance defines the margin of the classifier, maximizing the margin reduces indecisive decisions. SVM also supports classification and regression which are useful for statistical learning theory and it helps recognizing the factors precisely, that needs to be taken into account, to understand it successfully.

Steps followed by SVM:

- Import the dataset.
- Explore the data to figure out what they look like.
- Pre-process the data.
- Split the data into attributes and labels.
- Divide the data into training and testing sets.
- Train the SVM algorithm.
- Make some predictions.
- Evaluate the results of the algorithm

IV. IMPLEMENTATION OF MODULES

There are mainly two modules in this application. The modules of this app are as follows:

1. Faculty Module
2. Student Module

1. Faculty Module

It contains users like primary faculty, HOD's and Super users.

The primary users of the Student Feedback System are members of faculty. When a faculty enters the faculty id and password the database checks whether the faculty id and password are valid. If valid their account will be opened and it contains the feedback report.

The HOD users of the Student Feedback System are members of faculty. When a HOD enters the HOD id and password the database checks whether the HOD id and password are valid. If valid their account will be opened and it contains modules like add faculty, view faculty and view class. One HOD cannot view the results of other Department faculty and cannot view the other department classes. The super users of the Student Feedback System are members of faculty. When a super user enters the super user id and password the database checks whether the super user id and password are valid. If valid their account will be opened and it contains the modules like view faculty and view class, logs. By using logs module, he can view the operations performed by the HOD's and faculty.

2. Student Module:

Students will enter their roll number and section details. On the basis of section, it will display the corresponding faculty name and faculty id. By clicking on the faculty id, user gets feedback form, it contains around 15 Questions, students will select the corresponding answers in their point of view and data is stored in the server.

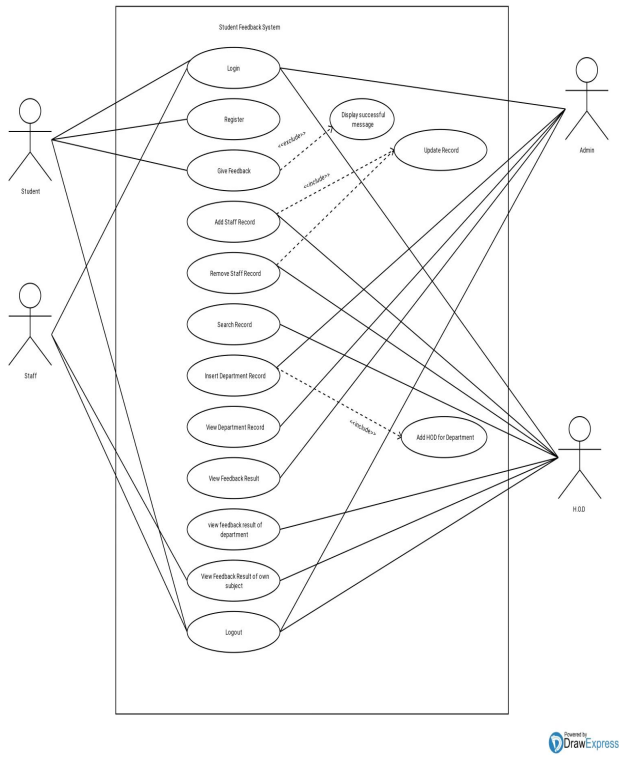


Figure2. Use Case Diagram

Figure 2 gives use case diagram, figure 3, 4, 5 gives home page, login page and feedback form of the system respectively. Also figure 5 gives Bar chart of results, figure 6 gives classification of results and figure 7 gives dataset used in the system.

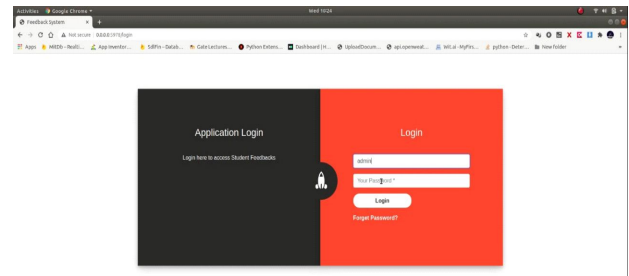


Figure4. Login Page

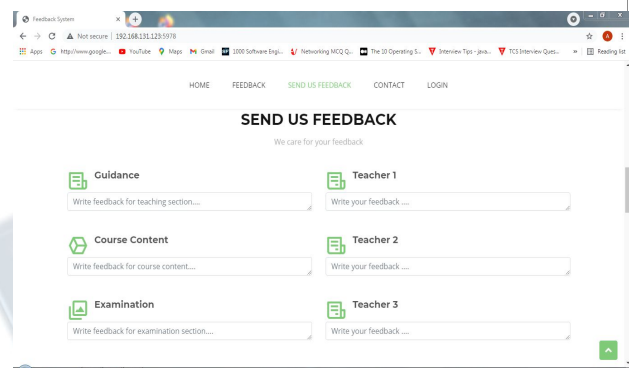


Figure5. Feedback Form

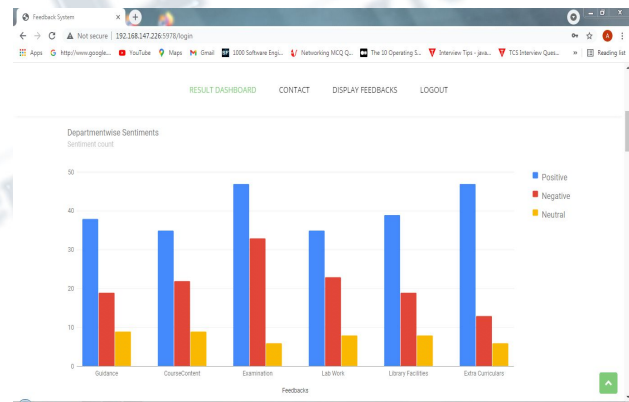


Figure6. Bar Chart

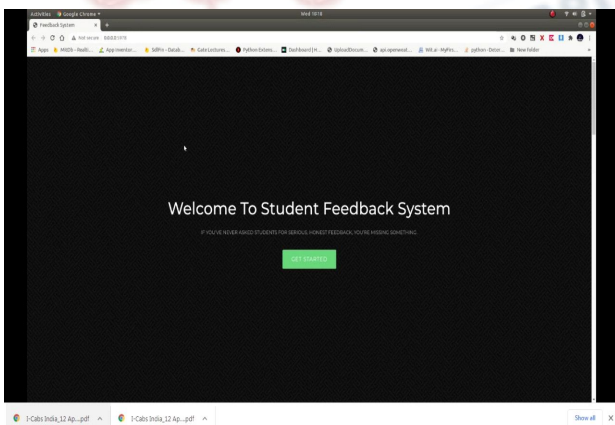


Figure3. Home Page

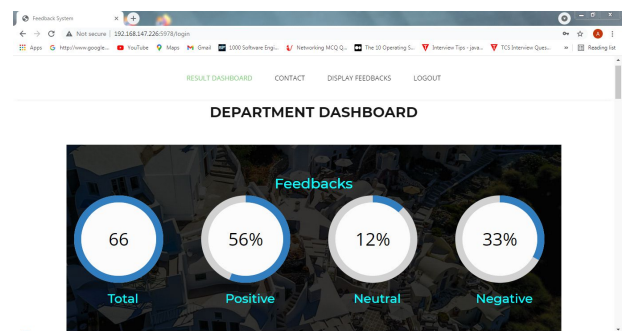


Figure7. Feedback Classification

Timestamp	teaching score	teaching	course content score	course content	examination score	examination	lab work score	lab work	library facilities score	library facilities	extra curricular score	extra curricular
20/02/2021 12:07:47	1.0	I can't understand the method of teaching	1.0	very Good... and innovative	0.0	Examination pattern is good but it can be done better	1.0	practicals are conducted regularly and in appropriate manner	1.0	Some books are not provided and quality is very bad	-1.0	No extra curricular
20/02/2021 12:11:16	1.0	The instructor was interested in the students and their progress	1.0	The instructor showed enthusiasm for the course component	1.0	He was not prepared to explain the course for examination	0.0	The instructor was not prepared for the session but he explained it in a good manner	1.0	The library facilities are not good	1.0	They like it in the actual
20/02/2021 12:24:24	-1.0	The instructor don't use any expertise for explanation	1.0	The course content provided by this teacher is not sufficient for exams	0.0	at the time of examination the provided content is not good to be explained in a easy manner	1.0	in practice exam he helped as a lot	1.0	the environment of library contributed to its spiritual growth	0.0	they like it but only 2
20/02/2021 12:30:03	0.0	Teaching is good but always late to class	1.0	Finish course on time	1.0	Pattern is easy	1.0	Easy	0.0	All books are not available but that is quite big	1.0	like
21/02/2021 12:40:16	0.0	Explanation is poor. The teaching is slow. They don't teach the	0.0	Never finish course on time	1.0	Easy	1.0	Good	1.0	Good	0.0	Amaze

Figure8. Dataset

V. CONCLUSION

This system collects student feedbacks and analyze them using one of the machine learning algorithm viz SVM algorithm. The analysis of the feedback is provided to the teacher in the form of ratings and graph so the data visualization becomes easier. The system helps to reduce manual work and it also helps to achieve good teaching learning process. This student feedback system, can manage communication between students and teachers which helps us to improve facilities and teaching method. This definitely help to achieve a good performance for teaching and learning process.

VI. FUTURE SCOPE

This Student Feedback System has been developed in such a manner, that the future requirements of the user are met. In future, there can be a provision to adjust the questions and to import new student names and faculty through the portal. It is also planned to implement the app on mobile platforms for OS like Windows and IOS.

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