

Project Review and Evaluation System

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Abstract:

Academic Project management whether Mini project or Major project is a major issue which is faced by many educational institutes, the main reason is, there is no automated system followed in any institute. College management/staff gather all the project reports and project sources from students and store them physically in some locations probably libraries. Since future is unpredictable and we cannot expect things to happen smoothly offline so in such cases we need everything to be done online without any problem.

To overcome this practical problem, we have come up with a Project approval system. In this system we have separate login and registration for students, internal guides and HOD. Students can enter their batch details, send their abstract to internal guides and HOD. Internal Guides and HOD can either approve or reject a project and can provide suggestions. One of the features is that, if the abstracts or project ideas of one or more groups are matching, then the batches are notified. Similarity of the project titles are checked using NLP and status of each and every batch is also displayed. Feedback can also be given to the students.

I. INTRODUCTION

Every undergraduate student will have to deal with submission of projects either in final or in penultimate year in college. Projects play an essential role in enhancing the learning experience for the students, as they involve in real life application of classroom knowledge. So, such an important academic quantity should be dealt with fairly and should be made sure that no mistakes happen when the idea of a project is conveyed to the respective faculty. Offline submission surely has its merits of getting direct insights from the teachers, but having an online platform for submission is something that stays at a higher place. Some students might want to submit their abstract to a faculty at a

specific time, but to their bad luck, the faculty may not be available. And other students might choose the same topic as their peers did, and end up colliding with them. Based on such real-life experiences, the creation of Project Evaluation and Review System took place.

Project Review and Evaluation Project is a novel idea that aims at solving the real-life problems faced by students and faculty when dealing with the submission of projects at graduation level. The main reason behind the existing inconvenience is there is no automated system followed in any educational institution. In a general scenario, College management/staff gather all the project reports and project sources from students and store them physically in some locations, probably libraries.

Since the future is unpredictable, we can't expect things to happen smoothly offline. So, to be well prepared and to ensure the smooth functioning of project assessment, we need to have an online interface, which consists of all the necessary features.

II. OBJECTIVES

- To create a web application, that implements the following objectives:
 - A team should be able to submit project abstracts to the faculty in online mode through their team accounts.
 - Faculty and HOD should be able to accept/reject and provide feedback for the abstract submitted by the team and display the same.
 - A team can submit abstracts to hod only if their guide accepts.
 - HOD can view all final projects details.
 - To show the similar titles on giving an input title for the project.

III. LITERATURE SURVEY

The Online Project Assessment and Supervision System is developed with the aim to make it as a standard system that can be used in the Minor and Major Project course for all students. The main focus of this article is to introduce the system design, which was developed as a medium of interaction between Internal guides, Students and HOD's in managing the project process especially in the stage of project's abstract preparation. Two main elements are Title checking and project monitoring.

In the existing system, all hardcopy of the project related documents such as project approval form, evaluation form, as well as the project progress validation form should be submitted to the Internal guide in offline mode. This practice sometimes will cause unexpected problems such as loss of forms, lack of documentation storage space, delay of submission of forms and so on. This makes it difficult for the Internal guide to effectively manage the documentation especially if it involves hundreds of students at one time. The Project Review and Evaluation System is developed to overcome the problem.

A Project committee is formed to cater all the managing processes led by the Internal guides. The

coordinators facilitate the interactions between all parties which involves students, HOD's and Guides. The project checks mainly about Project Titles, if the titles of two projects collide it gives a message. According to Abdulkareem et al (2013), a web portal lets users link with everything they need, the people needed and provides all the tools that are needed to work with [1]. Albar et al (2012) explained web-based systems using multi-agent technologies with client/server approach to access and receive information from databases to help supervisors and supervisees in their activities [2]. Currently, there is no web-based application or e-learning tools provided to facilitate all the administrative and management works in the project. All the form submission from the project title proposal form, project's progress form, to the evaluation form is conducted manually. The process of feedback collection from all parties requires a huge amount of papers and this will lead to the physical storage problem.

Furthermore, this will also result in difficulty in keeping track of all the project records especially when handling many supervisors and hundreds of project groups at one time. According to Romdhani et al (2011), students and academic staff supporting e-supervision systems are vital to facilitate communications and project management processes for FYP and dissertation [3]. Students and academic staff support the e-supervision system is vital to facilitate communications and project management processes for project evaluation. This will minimize the administrative works overhead guaranteeing a better control of project progression and monitoring.[4]

IV. METHODOLOGY

The home page of Project Review and Evaluation System consist of home page, Student login, Student Registration pages and Logout. Login and registration pages for Students, Internal guide and HOD have been created. Students can login using their Team number and password. If they are new, they can register using registration pages. After the student's login, the Team page will be visible which consists of upload project details to guide, view reply from guide, view reply from HOD. Team members can upload their details like Team name, Guide

name, Project title, Technology, File to upload and submit the details. The submitted details go to the Internal guide and HOD. We can view replies from guides and HOD using respective pages. The Internal Guide page consists of View project Details, View project Status. Guide can view all the Project details submitted to him. Guides can check the status of a project using Page and can upload status as accepted or rejected or any suggestions and submit it so that it can be viewed by the student. HOD can also do the same using pages. Project Title Similarity Search. This page consists of a search button. Whenever a title is given, it shows similar projects which are submitted by students with similar name or title or concept with Team name. The following are the modules present.

A. Module 1: Student Registration and Login

Student Registration helps the students to register their team on the platform by providing appropriate team name and password accordingly. Once the registration is successful, they can login to their account to submit their project abstracts, to view the replies from faculty and HOD and to check the status of their project. HTML, CSS and Flask are used to implement this module[5]. The user details are stored in databases which are created and managed by using MySQLAlchemy.

B. Module 2: Guide and HOD Registration and Login

Guide Registration will follow the similar steps as the student module does. Once the faculty successfully creates an account, they can check for the submitted abstracts. They can download the abstracts by simply clicking on it, and hence the project abstract can be available offline as well. After going through the abstract, they will have to update the status that will be shown on the student team’s account. There are two options for the status-Accept, when the project abstract meets the appropriate standards and reject, otherwise. The faculty will be provided space for remarks if they want to give any suggestion to the team. HTML, CSS and Flask are used to implement this module. The user details are stored in databases which are created and managed by using MySQLAlchemy.

C. Module 3: Text Similarity Search

In order to avoid submitting project abstracts with the same name, the students can avail this module to check for similar project abstracts. This module only shows the accepted abstracts. The rejected abstracts will have to be submitted again for approval, in order to be displayed in the results of the search. NLP is used to implement this module. The search results are the part of records from the stored database of accepted abstracts. The databases are created and are managed by MySQLAlchemy.

V. IMPLEMENTATION

A. Databases

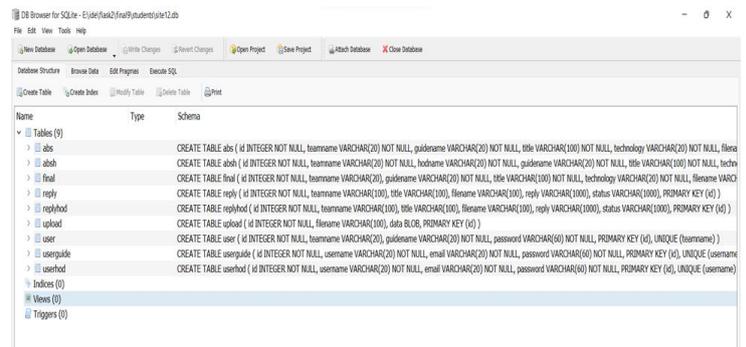


Figure 4.1 List of all tables in database

The above figure 4.1 is the list of all the tables which contain the data related to the project. It includes Teams, Guides, HOD’s details and the files submitted by teams as well as the evaluation remarks of guide and HOD.

| | id | teamname | guidename | password |
|----|--------|----------|-----------|----------|
| | Filter | Filter | Filter | Filter |
| 1 | 1 | C1 | G1 | 123 |
| 2 | 2 | C2 | G2 | 123 |
| 3 | 3 | C3 | G3 | 123 |
| 4 | 4 | C4 | G4 | 123 |
| 5 | 5 | C5 | G5 | 123 |
| 6 | 6 | C6 | G6 | 123 |
| 7 | 7 | C7 | G7 | 123 |
| 8 | 8 | C8 | G8 | 123 |
| 9 | 9 | C9 | G9 | 123 |
| 10 | 10 | C10 | G10 | 123 |
| 11 | 11 | C11 | G11 | 123 |
| 12 | 12 | C12 | G12 | 123 |
| 13 | 13 | C13 | G13 | 123 |
| 14 | 14 | C14 | G14 | 123 |
| 15 | 15 | C15 | G15 | 123 |
| 16 | 16 | C16 | G16 | 123 |
| 17 | 17 | a1 | g1 | 123 |
| 18 | 18 | A2 | G2 | 123 |

Figure 4.2 Team Details.

The figure 4.2 displays Team ID, Team Name, Password along with their respective Guides names.

| | id | username | email | password |
|----|--------|----------|--------------------------|----------|
| | Filter | Filter | Filter | Filter |
| 1 | 1 | G1 | G1@gmail.com | 123 |
| 2 | 2 | G2 | G2@gmail.com | 123 |
| 3 | 3 | G3 | G3@gmail.com | 123 |
| 4 | 4 | G4 | G4@gmail.com | 123 |
| 5 | 5 | G5 | G5@gmail.com | 123 |
| 6 | 6 | G6 | G6@gmail.com | 123 |
| 7 | 7 | G7 | G7@gmail.com | 123 |
| 8 | 8 | G8 | G8@gmail.com | 123 |
| 9 | 9 | G9 | G9@gmail.com | 123 |
| 10 | 10 | G10 | G10@gmail.com | 123 |
| 11 | 11 | G11 | saisindhuja012@gmail.com | 123 |
| 12 | 12 | G12 | saisindhuja012@gmail.com | 123 |
| 13 | 13 | G13 | saisindhuja012@gmail.com | 123 |
| 14 | 14 | G14 | saisindhuja012@gmail.com | 123 |
| 15 | 15 | G15 | saisindhuja012@gmail.com | 123 |
| 16 | 16 | G16 | saisindhuja012@gmail.com | 123 |
| 17 | 17 | g1 | saisindhuja012@gmail.com | 123 |

Figure 4.3 Guide details

The figure 4.3 displays Guides details which includes Guide ID, Guide name with their respective Email ID, passwords

| | id | username | email | password |
|---|--------|----------|--------------|----------|
| | Filter | Filter | Filter | Filter |
| 1 | 1 | H1 | H1@gmail.com | 123 |

Figure 4.4 HOD Details

The figure 4.4 displays HOD details which includes

HOD ID, HOD name with respective Email ID, password.

| | id | teamname | guidename | title | technology | filename |
|----|--------|----------|-----------|---|------------------|-------------------------------|
| | Filter | Filter | Filter | Filter | Filter | Filter |
| 1 | 1 | C1 | G1 | Stress detection in women using ... | AI | stress.bt |
| 2 | 2 | C2 | G2 | BookMySports | PHP,MYSQL | SPORTS.bt |
| 3 | 3 | C3 | G3 | Automatic power monitoring system ... | IOT | power.bt |
| 4 | 4 | C4 | G4 | Facial and Speech Emotion based ... | ML,NLP | Speech.bt |
| 5 | 5 | C4 | G4 | Facial and Speech Emotion based ... | NLP | NEWFINAL.bt |
| 6 | 6 | C5 | G5 | Deep Learning Model with Progressiv... | DL | Retinopathy.bt |
| 7 | 7 | C6 | G6 | Project Review and Evaluation System | NLP | Project.bt |
| 8 | 8 | C7 | G7 | Bus Tracking and Virtual ... | IOT | Tracking.bt |
| 9 | 9 | C8 | G8 | WhatsApp Web Clone | web | web.bt |
| 10 | 10 | C9 | G9 | Soil fertility health and crop prediction | ML | Health.bt |
| 11 | 11 | C10 | G10 | Student Surveillance System for ... | DL | surveillance.bt |
| 12 | 13 | C11 | G11 | Food calorie estimation using Image ... | Neural Networks | reg (1) (3).docx |
| 13 | 15 | C14 | G14 | We Gesture | machine learning | reg (1) (3).docx |
| 14 | 16 | C12 | G12 | Sarcasm detection | machine learning | Document1 (2) (1).rtf |
| 15 | 17 | C12 | G12 | Sarcasm detection | machine learning | reg (1) (1).docx |
| 16 | 18 | C13 | G13 | Gnits Merchandising | wt | ABSTRACT (2) (1) (1) (1).docx |
| 17 | 19 | C13 | G13 | Gnits Merchandising | wt | reg (1) (3).docx |
| 18 | 20 | C15 | G15 | Segmentation of lung regions | ml | ABSTRACT (2) (1) (1) (1).docx |
| 19 | 21 | C15 | G15 | Segmentation of lung regions | machine learning | reg (1) (1) (1).docx |
| 20 | 23 | C16 | G16 | Implementation of autonomous ... | Deep learning | titles.bt |
| 21 | 24 | a1 | g1 | 3 r | wt | Document1 (1) (1).rtf |
| 22 | 25 | A2 | G2 | Multimode surveillance system for ... | ml | titles.bt |

Figure 4.5 List of abstracts submitted to guide

The figure 4.5 displays all the abstracts submitted by teams to their respective guides for their review and evaluation.

| | id | teamname | hodname | guidename | title | technology | filename |
|----|--------|----------|---------|-----------|---|------------------|-----------------------|
| | Filter | Filter | Filter | Filter | Filter | Filter | Filter |
| 1 | 1 | C1 | My HOD | G1 | Stress detection in women using ... | AI | stress.bt |
| 2 | 2 | C2 | My HOD | G2 | BookMySports | PHP,MYSQL | SPORTS.bt |
| 3 | 3 | C3 | My HOD | G3 | Automatic power monitoring system ... | IOT | power.bt |
| 4 | 4 | C4 | My HOD | G4 | Facial and Speech Emotion based ... | NLP | NEWFINAL.bt |
| 5 | 5 | C5 | My HOD | G5 | Deep Learning Model with Progressiv... | DL | Retinopathy.bt |
| 6 | 6 | C6 | My HOD | G6 | Project Review and Evaluation System | NLP | Project.bt |
| 7 | 7 | C7 | My HOD | G7 | Bus Tracking and Virtual ... | IOT | Tracking.bt |
| 8 | 8 | C8 | My HOD | G8 | WhatsApp Web Clone | web | web.bt |
| 9 | 9 | C9 | My HOD | G9 | Soil fertility health and crop prediction | ML | Health.bt |
| 10 | 10 | C10 | My HOD | G10 | Student Surveillance System for ... | DL | surveillance.bt |
| 11 | 11 | C11 | My HOD | G11 | Food calorie estimation using Image ... | Neural Networks | reg (1) (3).docx |
| 12 | 12 | C14 | My HOD | G14 | We Gesture | machine learning | reg (1) (3).docx |
| 13 | 13 | C12 | My HOD | G12 | Sarcasm detection | machine learning | reg (1) (1).docx |
| 14 | 14 | C13 | My HOD | G13 | Gnits Merchandising | wt | reg (1) (3).docx |
| 15 | 15 | C15 | My HOD | G15 | Segmentation of lung regions | machine learning | reg (1) (1) (1).docx |
| 16 | 16 | C16 | My HOD | G16 | Implementation of autonomous ... | Deep learning | titles.bt |
| 17 | 17 | a1 | My HOD | g1 | 3 r | wt | Document1 (1) (1).rtf |
| 18 | 18 | A2 | My HOD | G2 | Multimode surveillance system for ... | ml | titles.bt |

Figure 4.6 List of abstracts submitted to HOD

The figure 4.6 displays all the abstracts submitted by teams to HOD for their review and evaluation. A team can submit their abstracts to HOD only after they are approved by Guide.

| id | teamname | title | filename | reply | status |
|----|----------|---|-------------------------------|-----------------------------------|---------|
| 1 | C1 | Stress detection in women using ... | stress.txt | Good | Approve |
| 2 | C2 | BookMySports | SPORTS.txt | It is ok | Approve |
| 3 | C3 | Automatic power monitoring system ... | power.txt | Need some improvements | Approve |
| 4 | C4 | Facial and Speech Emotion based ... | Speech.txt | NO make some changes and send ... | Reject |
| 5 | C4 | Facial and Speech Emotion based ... | NEWFINAL.txt | This is better | Approve |
| 6 | C5 | Deep Learning Model with Progressiv... | Retinopathy.txt | OKAY GOOD | Approve |
| 7 | C6 | Project Review and Evaluation System | Project.txt | DONE | Approve |
| 8 | C7 | Bus Tracking and Virtual ... | Tracking.txt | Fine | Approve |
| 9 | C8 | WhatsApp Web Clone | web.txt | Wonderful | Approve |
| 10 | C9 | Soil fertility health and crop prediction | Health.txt | Make some changes | Approve |
| 11 | C10 | Student Surveillance System for ... | surveillance.txt | Go ahead and submit to HOD | Approve |
| 12 | C11 | Food calorie estimation using Image ... | reg (1) (3).docx | good | Approve |
| 13 | C14 | We Gesture | reg (1) (3).docx | good | Approve |
| 14 | C12 | Sarcasm detection | Document1 (2) (1).rtf | not good | Reject |
| 15 | C12 | Sarcasm detection | reg (1) (1).docx | Good | Approve |
| 16 | C13 | Gnits Merchandising | ABSTRACT (2) (1) (1) (1).docx | Not good | Reject |
| 17 | C13 | Gnits Merchandising | reg (1) (3).docx | Good | Approve |
| 18 | C15 | Segmentation of lung regions | ABSTRACT (2) (1) (1) (1).docx | not good | Reject |
| 19 | C15 | Segmentation of lung regions | reg (1) (1) (1).docx | good | Approve |
| 20 | C16 | Implementation of autonomous ... | titles.txt | Good | Approve |
| 21 | a1 | 3 r | Document1 (1) (1).rtf | good | Approve |
| 22 | A2 | Multimode surveillance system for ... | titles.txt | Good | Approve |

Figure 4.7 The table for storing reply from guide

The figure 4.7 displays the feedback or suggestions given by Guide to the project abstracts submitted to him by teams. The guide can either approve the project or reject it.

| id | teamname | title | filename | reply | status |
|----|----------|---|-----------------------|-------------|---------|
| 1 | C1 | Stress detection in women using ... | stress.txt | DONE | Approve |
| 2 | C2 | BookMySports | SPORTS.txt | Good | Approve |
| 3 | C3 | Automatic power monitoring system ... | power.txt | Go ahead | Approve |
| 4 | C4 | Facial and Speech Emotion based ... | NEWFINAL.txt | Okay | Approve |
| 5 | C5 | Deep Learning Model with Progressiv... | Retinopathy.txt | Very good | Approve |
| 6 | C6 | Project Review and Evaluation System | Project.txt | FINE | Approve |
| 7 | C7 | Bus Tracking and Virtual ... | Tracking.txt | Not good | Reject |
| 8 | C8 | WhatsApp Web Clone | web.txt | Interesting | Approve |
| 9 | C9 | Soil fertility health and crop prediction | Health.txt | Good | Approve |
| 10 | C10 | Student Surveillance System for ... | surveillance.txt | Goood | Approve |
| 11 | C11 | Food calorie estimation using Image ... | reg (1) (3).docx | Good | Approve |
| 12 | C14 | We Gesture | reg (1) (3).docx | Good | Approve |
| 13 | C12 | Sarcasm detection | reg (1) (1).docx | ugg | Approve |
| 14 | C13 | Gnits Merchandising | reg (1) (3).docx | Good | Approve |
| 15 | C15 | Segmentation of lung regions | reg (1) (1) (1).docx | Good | Approve |
| 16 | C16 | Implementation of autonomous ... | titles.txt | Good | Approve |
| 17 | a1 | 3 r | Document1 (1) (1).rtf | Good | Approve |
| 18 | A2 | Multimode surveillance system for ... | titles.txt | Good | Approve |

Figure 4.8 The table for storing reply from HOD

The figure 4.8 displays the feedback or suggestions given by HOD to the project abstracts submitted to him by teams. The HOD can either approve the project or reject it.

B. Web Pages

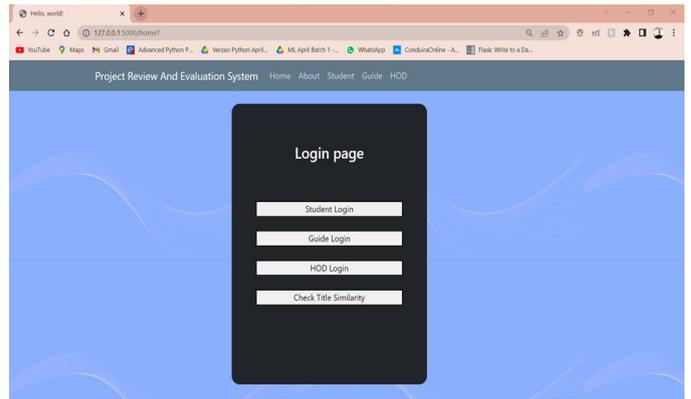


Figure 4.9 Home Page of the website

The figure 4.9 shows the home page of the website which provides a Login option to Teams, guides and HOD and also provides an option where any person can check for projects that are already approved in the Check Title Similarity option.

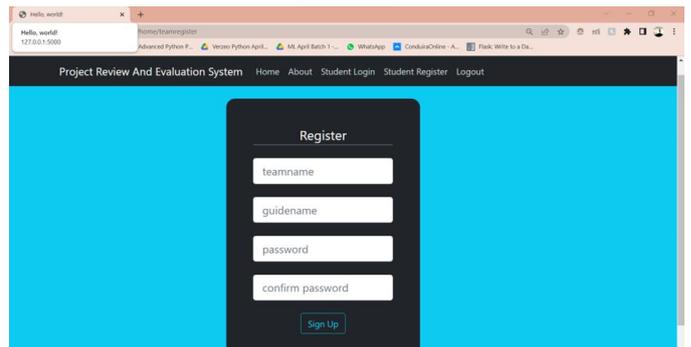


Figure 4.10 Team Registration form

The figure 4.10 shows a team registration form in which a team can register themselves in case if they are new users.

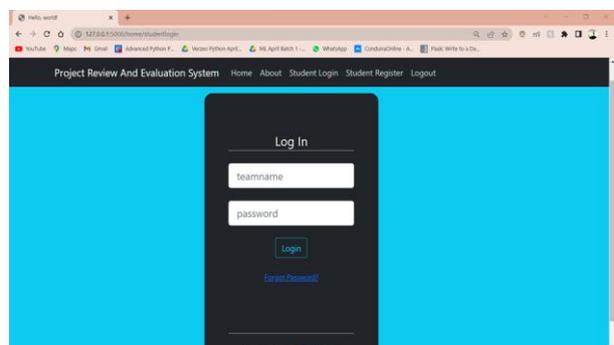


Figure 4.11 Team Login form

The figure 4.11 shows Team login form where an existing team can directly log in and perform their operations. In case if they are new then they are redirected to registration page shown in Figure 4.10

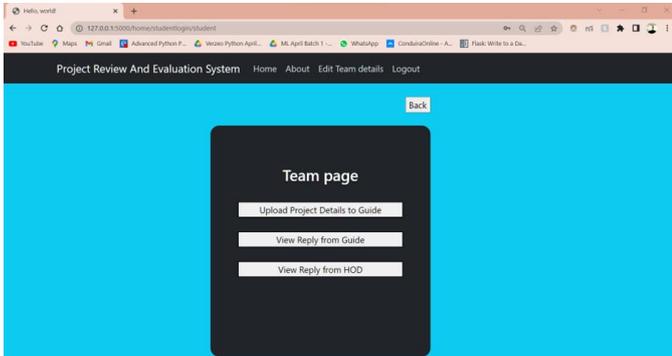


Figure 4.12 Home Page of Team

The figure 4.12 shows the home page of the team where they can perform various operations. They can upload their project details to Guide. They can view the replies sent by Guide and HOD as well

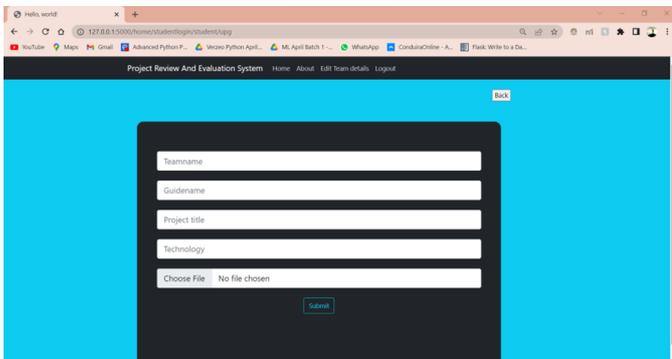


Figure 4.13 A form to upload project details

The figure 4.13 shows a form where a team can upload their project details with their project title, the technology or domain of the project and they can upload their documents or files.

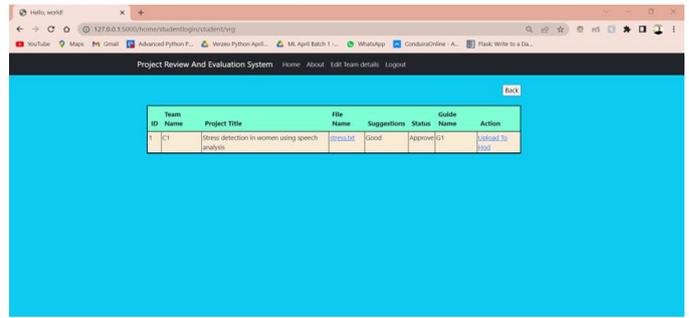


Figure 4.14 To View Reply from Guide

The figure 4.14 shows the reply that a guide sends to the team. It shows the suggestions as well as if the project has been approved or not. In case if the project is approved then the team can upload the documents to HOD.

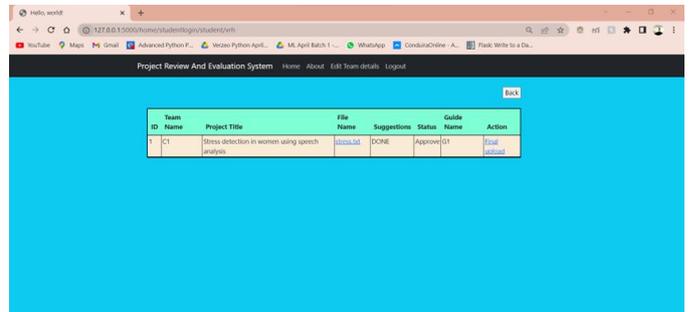


Figure 4.15 To View Reply from HOD

The figure 4.14 shows the reply that HOD sends to the team. It shows the suggestions as well as if the project has been approved or not.

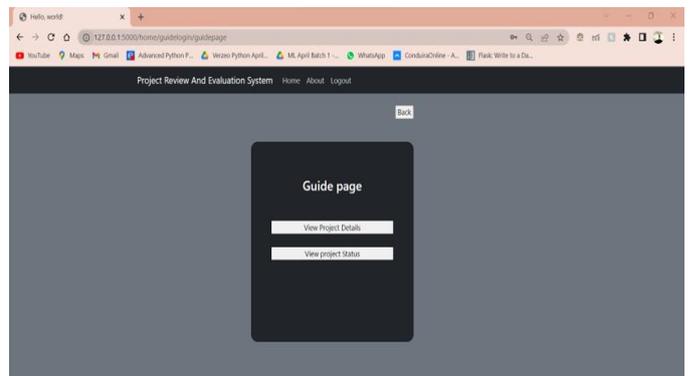


Figure 4.16 Home Page of Guide

The Figure 4.16 shows the options that a guide has . A guide can view the project details submitted by their respective teams and can view the suggestions provided for a project.

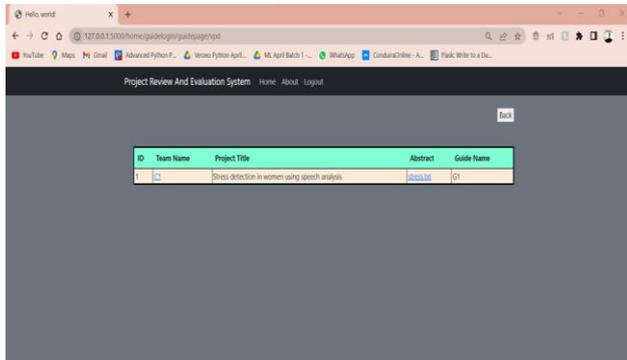


Figure 4.17 Project details submitted to guide

The figure 4.17 shows the project details submitted to guide. The guide can view project title, team name, guide name and can also download abstract by clicking abstract name

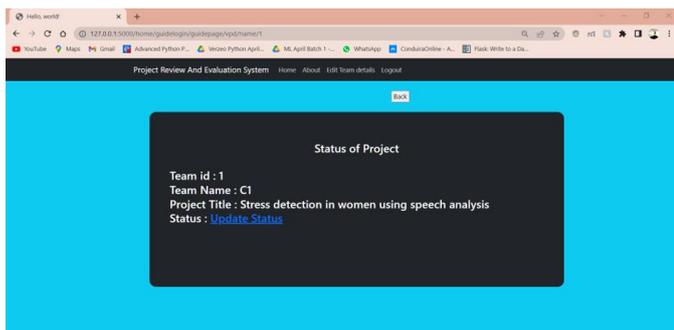


Figure 4.18 Status of the project

The figure 4.18 is displayed when the guide clicks on the team name. On clicking update status the guide can provide suggestions.

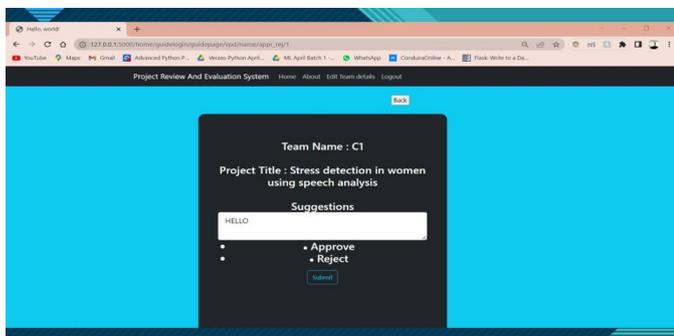


Figure 4.19 To provide suggestions for a team

The figure 4.19 shows that a guide has two options to approve or to reject a project. A guide can also provide suggestions for the project in the suggestions box.

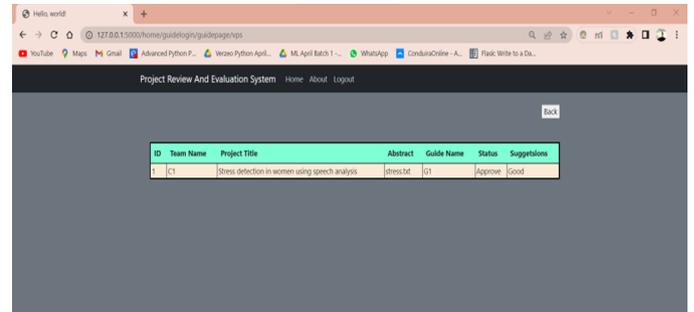


Figure 4.20 Project Status page

The figure 4.20 shows the suggestions provided by the guide for the respective project.

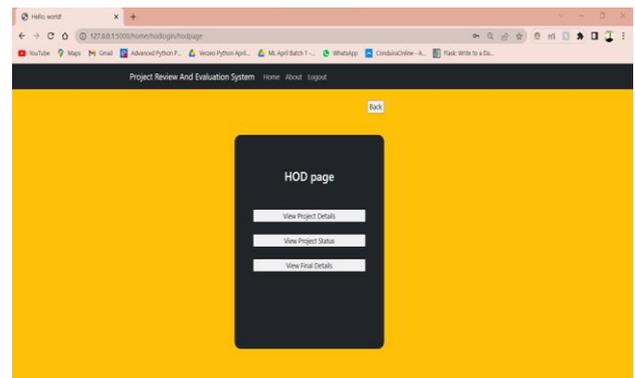


Figure 4.21 HOD home page

The figure 4.21 shows the options for HOD. The HOD can view details of the projects submitted, can view the suggestions provided and the list of all approved projects.

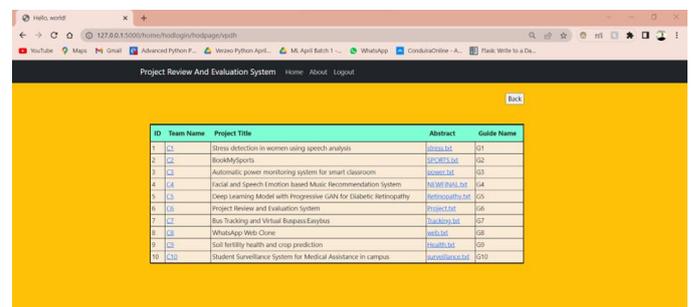


Figure 4.22 Details of projects submitted to HOD

The figure 4.22 shows the details of the projects submitted to HOD. The HOD can view project title, team name, guide name and can also download abstract by clicking abstract name.

| Team ID | Name | Project Title | Abstract | Guide Name | Status | Suggestions |
|---------|------|---|------------------|------------|----------|-------------|
| 1 | C1 | Stress detection in women using speech analysis | stress.txt | G1 | Approved | OK |
| 2 | C2 | BookMySports | SPKRTS.txt | G2 | Approved | Good |
| 3 | C3 | Automatic power monitoring system for smart classroom | power.txt | G3 | Approved | Go ahead |
| 4 | C4 | Facial and Speech Emotion based Music Recommendation System | NEWFINAL.txt | G4 | Approved | Okay |
| 5 | C5 | Deep Learning Model with Progressive GAN for Diabetic Retinopathy | Retinopathy.txt | G5 | Approved | Very good |
| 6 | C6 | Project Review and Evaluation System | Project.txt | G6 | Approved | FINE |
| 7 | C7 | Bus Tracking and Virtual Buspass System | Tracking.txt | G7 | Reject | Not good |
| 8 | C8 | WhatsApp Web Clone | web.txt | G8 | Approved | Interesting |
| 9 | C9 | Soil fertility health and crop prediction | Health.txt | G9 | Approved | Good |
| 10 | C10 | Student Surveillance System for Medical Assistance in Campus | surveillance.txt | G10 | Approved | Good |

Figure 4.23 Project Status

The figure 4.23 shows the suggestions provided by guide for the respective project.

| Team ID | Name | Project Title | Technology | Abstract | Guide Name |
|---------|------|---|------------|------------------|------------|
| 1 | C1 | Stress detection in women using speech analysis | AI | stress.txt | G1 |
| 2 | C2 | BookMySports | PHP/MySQL | SPKRTS.txt | G2 |
| 3 | C3 | Automatic power monitoring system for smart classroom | IoT | power.txt | G3 |
| 4 | C4 | Facial and Speech Emotion based Music Recommendation System | NLP | NEWFINAL.txt | G4 |
| 5 | C5 | Deep Learning Model with Progressive GAN for Diabetic Retinopathy | DL | Retinopathy.txt | G5 |
| 6 | C6 | Project Review and Evaluation System | NLP | Project.txt | G6 |
| 7 | C8 | WhatsApp Web Clone | web | web.txt | G8 |
| 8 | C9 | Soil fertility health and crop prediction | ML | Health.txt | G9 |
| 10 | C10 | Student Surveillance System for Medical Assistance in Campus | DL | surveillance.txt | G10 |

Figure 4.24 Final Projects Approved by HOD

The figure 4.24 shows the list of all final project titles approved by HOD along with their team name, guide name, technology and option to download abstracts.

| Document | Team Name |
|---|-----------|
| Project Review and Evaluation System | C6 |
| Soil fertility health and crop prediction | C9 |
| Automatic power monitoring system for smart classroom | C3 |
| Facial and Speech Emotion based Music Recommendation System | C4 |
| Deep Learning Model with Progressive GAN for Diabetic Retinopathy | C5 |

Figure 4.25 The Similarity Search

The figure 4.25 shows the project title similarity search. On entering the project title in the search bar, it displays the list of similar project titles along with the batch name.

C. Algorithm

Sentence Similarity:

```
from sentence_transformers import
SentenceTransformer
logger = logging.getLogger(__name__)
logger.setLevel(logging.INFO)
```

```
class SentenceSimilarity():
    def __init__(self, dataset: Dataset, model:
SentenceTransformer = None, n_docs: int = -1):
        self.dataset = dataset
        self.model = model if model else
SentenceTransformer("bert-base-nli-stsb-mean-
tokens")
```

```
self.sentences = []
self.doc_id_to_sentence_ids = {}

self.sentence_pattern =
re.compile(r'(?<!(w|.w.)(?<![A-Z][a-
z].)(?<=\.|?)s')
```

```
for d in dataset.get_documents(n=n_docs):
    doc_id = d.get('id')
    text = d.get('text', None)
```

```
sentence_ids = []
if text:
    sentences = re.split(self.sentence_pattern,
text)
    for s in sentences:
```

```
sentence_ids.append(len(self.sentences))
self.sentences.append(s)
self.doc_id_to_sentence_ids[doc_id] =
sentence_ids
logger.debug(f"doc_to_sentence_ids:
{self.doc_id_to_sentence_ids}")
```

```

self.sentence_id_to_doc_id = {}
for doc_id, sentence_ids in self.doc_id_to_sentence_ids.items():
    for s_id in sentence_ids:
        self.sentence_id_to_doc_id[s_id] = doc_id

logger.debug(f"sentence_id_to_doc_id:
{self.sentence_id_to_doc_id}")
start = time.time()
self.embedded_sentences = self.model.encode(self.sentences)
logger.info(f"It took {round(time.time()-start,
3)} s to embedd {len(self.sentences)} sentences.")

```

Cosine Distance:

```

def get_most_similar(self, query: AnyStr, threshold:
float = 1, limit: int =5) -> List[int]:
    query_sentences = re.split(self.sentence_pattern, query)
    query_embeddings = self.model.encode(query_sentences)

    logger.info(f"Extracted
{len(query_sentences)} sentences from query")
    logger.debug(f"Sentences: {'
'.join(query_sentences)}")

    cosine_dist = scipy.spatial.distance.cdist(query_embeddings,
self.embedded_sentences, "cosine")

    below_threshold = cosine_dist < threshold
    doc_ids, matched_column_ids = np.where(below_threshold)

    x_y_dist = []
    for x,y in zip(doc_ids, matched_column_ids):
        x_y_dist.append([x,y,cosine_dist[x][y]])
    sorted_x_y_dist = sorted(x_y_dist,
key=lambda x: x[2])
    sorted_sentence_ids = [doc[1] for doc in
sorted_x_y_dist]
    sorted_doc_ids = [self.sentence_id_to_doc_id[sent_id] for sent_id in
sorted_sentence_ids]

```

```

logger.info(f"Distance for top documents:
{[round(x[2],3) for x in sorted_x_y_dist[:limit]]}")
return self.dataset.get_documents_by_id(list(dict.fromkeys(
sorted_doc_ids).keys())[:limit])

```

VI. TOOLS AND TECHNOLOGIES

A. VS Code

Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including Java, JavaScript, Go, Node.js, Python and C++[6]. It is based on the Electron framework, which is used to develop Node.js Web applications that run on the Blink layout engine. Visual Studio Code employs the same editor component (codenamed "Monaco ") used in Azure DevOps (formerly called Visual Studio Online and Visual Studio Team Services). Instead of a project system, it allows users to open one or more directories, which can then be saved in workspaces for future reuse. This allows it to operate as a language agnostic code editor for any language. It supports a number of programming languages and a set of features that differs per language. Unwanted files and folders can be excluded from the project tree via the settings. Many Visual Studio Code features are not exposed through menus or the user interface but can be accessed via the command palette. Visual Studio Code can be extended via extensions, available through a central repository. This includes additions to the editor and language support. A notable feature is the ability to create extensions that add support for new languages, themes, and paraphrase mining. The framework is based on PyTorch and Transformers and offers a large collection of pre-trained models tuned for various tasks. Further, it is easy to finetune your own models.

B. Flask

Flask is an API of Python that allows us to build up web-applications. It was developed by Armin Ronacher. Flask's framework is more explicit than Django's framework and is also easier to learn because it has less base code to implement a simple

web-Application. A Web-Application Framework or Web Framework is the collection of modules and libraries that helps the developer to write applications without writing the low-level codes such as protocols, thread management, etc. Flask is based on the WSGI(Web Server Gateway Interface) toolkit and Jinja2 template engine. Flask is part of the categories of the micro-framework. Micro-framework is normally a framework with little to no dependencies to external libraries. This has pros and cons. Pros would be that the framework is light, there is little dependency to update and watch for security bugs, cons is that sometimes there will be need to do more work i.e increasing the list of dependencies by adding plugins.

C. NLP

Natural language processing (NLP) is a subfield of artificial intelligence concerned with the interactions between computers and human language, in particular how to program computers to process and analyze large amounts of natural language data. The goal is a computer capable of "understanding" the contents of documents, including the contextual nuances of the language within them. The technology can then accurately extract information and insights contained in the documents as well as categorize and organize the documents themselves. A big part of NLP relies on similarity in high-dimensional spaces. Typically an NLP solution will take some text, process it to create a big vector/array representing said text — then perform several transformations. To represent high dimensional vector sentence transformers have been used. Sentence Transformers is a Python framework for state-of-the-art sentence, text, and image embeddings. Embeddings can be computed for 100+ languages and they can be easily used for common tasks like semantic text similarity, semantic search, and paraphrase mining. The framework is based on PyTorch and Transformers and offers a large collection of pre-trained models tuned for various tasks. Further, it is easy to finetune your own models.

D. HTML

HTML (HyperText Markup Language) is the code

that is used to structure a web page and its content. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as `<h1>` and `<p>` directly introduce content into the page. Other tags such as

`<div>` surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags but use them to interpret the content of the page. HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages. Inclusion of CSS defines the look and layout of content.

E. CSS

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, which reduces complexity and repetition in the structural content; and enable the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

Separation of formatting and content also makes it possible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (via speech-based browser

or screen reader), and on Braille-based tactile devices. CSS also has rules for alternate formatting if the content is accessed on a mobile device

F. SQLAlchemy

SQLAlchemy is the Python SQL toolkit and Object Relational Mapper that gives application developers

the full power and flexibility of SQL. It provides a full suite of well known enterprise-level persistence patterns, designed for efficient and high performing database access, adapted into a simple and Pythonic domain language. SQL databases behave less like object collections the more size and performance start to matter; object collections behave less like tables and rows the more abstraction starts to matter. SQLAlchemy aims to accommodate both of these principles.[7] SQLAlchemy considers the database to be a relational algebra engine, not just a collection of tables. Rows can be selected from not only tables but also joins and other select statements; any of these units can be composed into a larger structure. SQLAlchemy's expression language builds on this concept from its core. SQLAlchemy is most famous for its object-relational mapper (ORM), an optional component that provides the data mapper pattern, where classes can be mapped to the database in open ended, multiple ways - allowing the object model and database schema to develop in a cleanly decoupled way from the beginning.[8]

VII. CONCLUSION

The project review and evaluation system is aimed at automating the existing manual system for review and evaluation of projects and process the approval request through faculty.[9] It helps in maintaining the records of the students which will help the faculty team to manage project evaluation and documentation. It is useful in organizations with a large number of students with various departments[10]. It's a quick process as it takes less time when compared to a manual process. It is very reliable and it leads to efficient data management. For future work a mailing module can be planned which will allow students to send email to HOD and guides with attachments. View/send/reply email

options can be provided. Alerts or notification modules can be added separately which will show a notification icon and which when clicked will open the related information for which notification was received.

VIII. RESULTS AND DISCUSSIONS

In the proposed project the login and registration pages for Students, Guides and HOD have been created and a connection has been established between them. An interface has been provided for uploading the project abstracts and getting the approval status and feedback from the respective guide and HOD. The feature of title similarity using Natural language processing (NLP) has been implemented. Given a Project title, the Sentence Similarity search returns the top five similar titles along with the batch name.

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