Ver	Reason for change	Minor/Major	Ver	Reason for Change	Minor/Major
0	Obj. rewriting@zeroth	Major	1	correlation change@zeroth	Major
2	Obj. rewriting@zeroth	Minor	2.1	Current Document	Approved

Department of Computer Sc. & Engg, Govt. Engg. College – Thrissur
PROJECT(P1) IDEA RESERVATION
2022-2023 ODD

1. **Program:** B.Tech.in Computer Sc. & engineering **Batch:** 2019 Adm.
2. **Team Members:** as many entries as in your group, max. 4
   1. Devi Krishna M K Uni. Reg. No: TCR19CS026
   2. Maria Viji George Uni. Reg. No: TCR19CS039
   3. Navneeth Variar Uni. Reg. No: TCR19CS047
   4. Niranjan Neelakantan (leader) Uni. Reg. No: TCR19CS049
3. **Team leader:** Niranjan Neelakantan Uni. Reg. No: TCR19CS049
4. **Guided by:** Mrs. Princy Ann Thomas, Assistant Professor
5. **Broad area:** Artificial Intelligence
6. **Sub area:** Natural Language Processing and Optical Character Recognition
7. **Project idea:** Phase-1 : Identify the characters from handwritten malayalam text using deep learning models and evaluate one-word answers.
   Phase - 2: Automatically evalute descriptive malayalam answers by text summarization of written answer using NLP models and comparison with correct answer provided by evaluator
8. **Objectives of project work:**

   O1: To alleviate the task of malayalam answer paper evaluators.

   O2: To explore different techniques to improve the accuracy of Malayalam handwriting recognition algorithms.

   O3: To tweak the existing automated evaluation systems and enhance the scope and usability of it.

   O4: To increase the familiarity with the concepts of optical character recognition and machine learning techniques.

   O5: To design and implement a prototype by efficiently utilising the diverse skills of the team, using concepts of project management and software development.
9. **Correlation to course outcomes:**

   CSD 415.CO1: Model and solve real world problems by applying knowledge across domains Cognitive knowledge level: Apply)

   CSD 415.CO2: Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).

CSD 415.CO3: Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply)

CSD 415.CO4: Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply)

CSD 415.CO5: Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze)

CSD 415.CO6: Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply)

	CO1	CO2	Justification
O1	3	3	CO1: Solve real world problem CO2: Social relevance
O2			CO1: CO2:
O3	2	1	CO1: Solve real world problem CO2: Social relevance
O4			CO1: CO2:
O5	2	3	CO1: individual tasks CO2: execute tasks

	CO3	CO4	Justification
O1			CO3: CO4:
O2	2	2	CO3: individual tasks CO4: execute tasks
O3	1		CO3: individual tasks CO4:
O4	2	3	CO3: individual tasks CO4: execute tasks
O5	2	3	CO3: individual tasks CO4: execute tasks

	CO5	CO6	Justification
O1	1		CO5: propose solutions CO6:
O2	3		CO5: propose solutions CO6:
O3	2	1	CO5: propose solutions CO6: communicate findings
O4	1	1	CO5: propose solutions CO6: communicate findings
O5	1	1	CO5: propose solutions CO6: communicate findings

10. **Important Statistics about project work**

Date from which working for this idea:	14-09-22
Date on which guide approved this idea:	23-09-22
Classification: {Internal}{External}{Internship} {new idea} {variant of an idea}	{Industrial/Social} /{Academic/Research}/ {re-contextualize without functional change} /{existing work}/
Work related to: Earlier work by group RESEARCH INTEREST of Guide Guide's new TOPIC of interest NOW Earlier work in other institution - new NOW	/TOPIC of interest of guide/ /Guide's new RESEARCH interest NOW/ /Earlier work by seniors/ /new variation NOW/ Work not related to any of above
Source of Idea:	{Student} /{Guide}/ /{BOTH}/

11. **Related works:**

(a) Subjective Answers Evaluation Using Machine Learning and Natural Language Processing - [1]: The paper proposes a novel approach using different NLP techniques like Wordnet,Word2vec,cosine

similarity to evaluate subjective answers automatically.Solution statements and keyword matching are used to evaluate the answers.ML model is trained to predict the scores.

(b) Proposed method to Malayalam Handwritten Character Recognition using Residual Network enhanced by multi-scaled features - [2]:A novel hybrid approach for recognizing the characters of malayalam handwritten texts is proposed in the paper.By combining the statistical features and structural features of the characters,more accuracy is obtained in malayalam character recognition. The proposed system has claimed to have obtained around 97 percentage accuracy in malayalam character recognition.

(c) Towards Automated Evaluation of Handwritten Assessments - [3]:

The paper introduces a framework that integrates ideas from information retrieval,NLP and feature based keyword spotting to automate the evaluation of short descriptive answers.Along with keywords from textual reference,semantically relevant keywords to that in textual reference is obtained using information retrieval and various Natural Language Processing Techniques.The added feature of spotting semantically relevant keywords has resulted in the increased accuracy of score prediction.

12. **Work plan:**

Action plan				
Sl. No.	**Activity**	**Date**	**Signature of guide**	**Remarks**
	Project course activity starting	12-09-22		
	Date of fixing project topic,title	20-09-22		
	Date of Zeroth step valuation	18-10-22		
	Date of completion of SRS	25-10-22		
	Dt. of finishing work-plan, task allocation	30-10-22		
	Dt. of completion of project synopsis	01-11-22		
	Date of Interim evaluation	08-11-22		
	Date of completion of conceptual design	16-11-22		
	Date of completion of methodologies	21-11-22		
	Dt. of completion of work-plan for S8	30-11-22		
	Date of completion of funding proposal	03-12-22		
	Date of Endsem evaluation	06-12-22		
	Date of completion of report review	13-12-22		
	Date of approval by coordinators	19-12-22		

13. **Brief description of work:**

Collect and create malayalam characters' and documents' datasets and create a model to recognize malayalam characters using deep learning techniqies in the field. Then create an auto-evaluation system which evaluates single word answers comparing the written answer with the given correct answer by the evaluator. In the next phase, apply state-of-the-art NLP models to extract meaning from descriptive malayalam answers and then expand the scope of the auto-evaluation system to descriptive written texts as well.

14. **Facilities to be provided by department:**

    - Uninterrupted high speed wi-fi connection.
    - Lab space to work
    - High end machine capable to train ML models with large datasets.

15. **References:**

[1] Abdul Rehman Javed Natalia Kryvinska Shahab S. Band Muhammad Farrukh Bashir, Hamza Arshad. Subjective answers evaluation using machine learning and natural language processing. *IEEE Access*, 9(25), November 2021.

[2] Chandran Saravanan Samatha P Salim, Ajay James. Proposed method to malayalam handwritten character recognition using residual network enhanced by multi-scaled features. 2019.

[3] Jawahar C.V Vijay Rowtula, Subba Reddy Oota. Towards automated evaluation of handwritten assessments, 2019.

16. **Approval note of Guide:**
    This work is a variant of existing research done in the field of automated marking of English answer scripts. The project will accomplish automated marking for malayalam answer scripts. The work will begin with small valuation tasks like one word answers and dictations. The prototype will be implemented for this task. This work is relevant for online education and simplification of the existing valuation process.

Date of approval:

Signature of Student
email-id: niranjan2neelakantan@gmail.com

Signature of Guide
email-id: princyannthomas@gectcr.ac.in

Note:- Use these e-mail ids for communication. Communication send to any other address is invalid or is not part of seminar correspondence.