INFORMATICS INSTITUTE OF TECHNOLOGY
In Collaboration with
UNIVERSITY OF WESTMINSTER

Recourse Recommendations System

A Project Proposal by
Mr. Ushan Sankalpa

Supervised by
Mr. Cassim Farook

Submitted in partial fulfilment of the requirements for the BEng (Hons) Software
Engineering degree at the University of Westminster.

November 2022

Table of Contents

List of Figures
List of Tables
List of Abbreviations

1. INTRODUCTION

This document defines the background of the problem, the existing works that are related to my research topic, the solution that I am planning to implement, and how I am supposed to address the currently facing issues. The past research interests are also explored with their limitations and the research gaps are also identified with relevant reasons. Moreover, this paper further includes the solution methodology, the software and data requirements needed to implement it, the time plan, and the risk mitigation plan for the next few months of research work.

2. PROBLEM DOMAIN

Nowadays, most students learn using online resources. Even though students gained knowledge in universities, schools, and other institutes, they always tend to explore more to expertise in their fields with the help of online sources. There are different types of online resources for different learning styles (visual, read and write, auditory). For example, some students may be interested in watching tutorial videos. It will help them to extract the content more than reading documentation. But some students are more interested in reading and gaining knowledge than watching a video. Sometimes we cannot identify the most suitable learning type that suits us. When someone has to be ready for an exam within two to three days, he/she has to face difficulties in finding the best learning material for a specific subject that matches their learning style. In such cases, it would be a great solution to have an online resources recommendation system by identifying our learning styles.

3. PROBLEM DEFINITION

Every student has a different learning style. Some students are visual learners, while some students prefer to learn through audio. The online learning system, with its range of options and resources, can be personalized in many ways. It is hard to find the perfect online material for our subject and learning style. It takes more time to try out different sources and find the relevant ones. The main issue with most online resources is reliability. Even though we found the perfect match for our choice, the information it contains may not reliable.

3.1. Problem Statement

Students are facing difficulties in finding the best online resources that match their learning styles.

4. RESEARCH MOTIVATION

As a university student, I faced problems when choosing the right online sources when studying. It took me a period to find myself the best learning style that suits me. I found it by trying and following videos, reading materials, and making notes. It takes some time. In some situations, I had to watch so many tutorial videos from different sites to find the best one that meet my requirement. During the exam days, I encountered complications finding the suitable reference.

5. EXISTING WORK

Citation	Brief Description	Limitations	Contribution
Shao, Y. (n.d.). *Prediction of preferences on M-Learning based on VARK score using DNN to classify multi-label and single-label data*. [online] Available at: http://users.cecs.anu.edu.au/~Tom.Gedeon/conf/ABCs2020/paper/ABCs2020_paper_v2_184.pdf [Accessed 18 Oct. 2022].	This paper introduces a Deep Neural Network (DNN) classification model to predict four preferences of mobile learners, including audio, PowerPoint, video, and e-book, by using the symbolic dataset from the study of AI-Ismail, Gedeon, and Yamin (2017).	This work provided a means of providing a learning material adaptability model using Naïve Bayes classifier and K-Means clustering algorithm, which associates a user profile to a content group.	This paper investigates how to use pre-encoded data to train a classification model for the prediction of mobile learners' preferences based on VARK scores. The motivation of choosing this dataset is related to the popularity of mobile learning.

Kerkiri, T., Manitsaris, A. and Mavridis, I. (2009). How e-learning systems may benefit from ontologies and recommendation methods to efficiently personalise resources. *International Journal of Knowledge and Learning*, 5(3/4), p.347. doi:10.1504/ijkl.2009.031229.	The considerable amount of knowledge through various documents within organisations increasingly grows. Their efficient maintenance and meaningful retrieval is of great importance	This work proved that the learner would have to examine much less retrieved resources in order to filter those that are suitable to his informational needs.	In this paper an e-learning system is proposed that is based on semantic web-based methods. In this system, the learners' feedback, expressed as reputation metadata, is used to propose suitable LRs', through recommendation techniques. Ontologies' are designed based on educational standards to implement the entities of the system.
Process of building a dataset and classification of vark learning styles with machine learning and predictive analytics models. (2021). *Journal of Contemporary Issues in Business and Government,*	As there is a rise in the online and customized learning platforms, learning style preferences give us insight into better utilization of educational resources available. VARK learning styles are developed by Fleming and Bonwell on the premises of preferred	This study explored the relationship between demographic factors like school and place people grew up and learning styles. Results proved to contradict those factors. They conclude that with the growth of big data learning style	This study shows the ability of the machine learning algorithms to ascertain the relationships between the data. The learning styles are an important part of the student's way of processing the information during the education.

26(02). doi:10.47750/cibg. 2020.26.02.128.	intake of information by the students.	classification, a blend of model algorithms or stacked algorithms like voting classifier can be used to adapt to a user application	
De Medio, C., Limongelli, C., Sciarrone, F. and Temperini, M. (2020). MoodleREC: A recommendation system for creating courses using the moodle e-learning platform. *Compute rs in Human Behavior*, 104, p.106168. doi:10.1016/j.chb. 2019.106168.	In this paper, the Web offers exceptional opportunities. An enormous wealth of learning resources and technologies can be made available in a relatively simple way: for teachers, the Web is a rich field, where they can find useful educational materials suitable for supple- menting or creating a course	From this analysis of earlier uses of interesting LOs, the teacher can decide to select a given LO from those in the ranked list. She/he can also be encouraged to use other LOs, not listed in the query response, on the basis of their usage, alongside of the LO in question, in other courses	In this work we addressed the teaching activity, presenting an extension of an LMS making it able to help the teacher build a course based on recommended LOs, whereas the recommendations come from the response of the LO to the requested features, and from the use that other teachers have done of the LO in different courses
Ezaldeen, H., Misra, R., Alatrash, R. and Priyadarshini, R. (2019). *Machine Learning Based*	The main purpose of e-learning is accessibility to users around the world in anywhere and anytime mode, and ability to find and select the	This work provided a means of providing a learning material adaptability model using Naïve Bayes classifier and K-	This paper presents an AI based E-learning system by incorporating intelligent support systems. Based on the

Improved Recommendation Model for E-learning. [online] IEEE Xplore. doi:10.1109/ICICRS46726.2019.9555866.	appropriate courses with less efforts and minimum time.	Means clustering algorithm, which associates a user profile to a content group.	need and aptitude of the student the learning materials could be chosen which will help both the students and the teachers to enhance the learning outcome as a whole

6. RESEARCH GAP

The suggested solution is about recommending learning resources for people with the same learning preferences using an algorithm by identifying their learning styles. The accuracy can be improved using that algorithm. The users can also suggest learning materials they followed using the feedback form.

7. CONTRIBUTION TO THE BODY OF KNOWLEDGE

By addressing the above gap what is the contribution you are going to make

7.1. Technological contribution

7.2. Domain contribution

8. RESEARCH CHALLENGE

Evidence for complexity and challenge to achieve, you need to write such that it gives reason why it could lead to a publication.

Publishable doesn't mean it is publishable in a conference but publishable in a https://mjl.clarivate.com/search-results journal

Further evidence to show that this can be further extended to PhD research

9. RESEARCH QUESTION/S

https://www.scribbr.com/research-process/research-questions/

10. RESEARCH AIM

One sentence

Further elaborate on the aim

11. RESEARCH OBJECTIVES

Elaborate the steps of atomic activities that you need to carryout to achieve the aim

Research Objectives	Explanation	Learning Outcome
Problem Identification		LO1
Literature Review	RO1 RO2 RO3	LO1
Data Gathering and Analysis		LO2, LO3
Research Design		
Implementation		
Testing and Evaluation		

12. PROJECT SCOPE

12.1. In-scope

12.2. Out-scope

12.3. Diagram showing prototype feature

13. METHODOLOGY

13.1. Research methodology

Research Philosophy	The author of the research has selected the positivism as the research philosophy
Research Approach	Deductive or inductive why?

Research Strategy	Experiment, survey => questionnaire (can be quantitative or qualitative) or interview (can be quantitative or qualitative),
Research Choice	Mono method => only one method can quantitative (Positivist) or qualitative (interpretivist), Multi method (More than one method but all belong to same paradigm (positivist or interpretivist)) or Mixed method (only pragmatist can mix the method => mixing the method from positivism and interpretivism)
Time zone	Cross-sectional or longitudinal

13.2. Development methodology

13.2.1. Life cycle model

13.2.2. Design Methodology

13.2.3. Evaluation Methodology

Benchmarking

      a. **What is the life cycle model and why?**
      b. **Design methodology => SSADM or OOAD or Anything else?**
      c. **Evaluation methodology => Evaluation metrics and/or benchmarking**

13.3. Project management methodology

13.3.1. Schedule

Gantt Chart

Deliverables

13.3.2. Resource Requirements

Software Requirements

Hardware Requirements

Data Requirements

Skill Requirements

13.3.3. Risk Management

      d. **Schedule using the Gantt Chart after doing a WBS (Do not have to provide the WBS)**
      e. **Deliverables, milestones and dates of deliverables**
      f. **Resource requirements**

     i. Hardware requirements
     ii. Software requirements
    iii. Skills requirements
    iv. Data Requirements
   g. Risk Management

Risk Item	Severity	Frequency	Mitigation Plan
	5	5	
	5	4	
	5	1	

REFERENCES

Structure of the report for ASE and FYP Students and CSF Students who will involve in development project

Introduction

Literature Review

Methodology

Requirement Elicitation and analysis

SLEP Framework

Design

Implementation

Testing

Evaluation

Conclusion

Structure of the report for CSF Students for students doing Conceptual Framework Research

Introduction

Literature Review

Methodology

Data Gathering and Analysis

SLEP Framework

Conceptual Framework Design

Evaluation

Conclusion