

Project Synopsis
on
CONNECT CAREER

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Bachelor of Technology
in
Computer Science



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DECLARATION

We hereby declare that this submission is our work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

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CERTIFICATE

This is to certify that Project Report entitled “**CONNET CAREER**” which is submitted by **Kashish Gupta , Khushi Vaish and Nikita Sharma** in partial fulfilment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

Date:

Supervisor Signature

Supervisor Name
(Designation)

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ABSTRACT

Choosing a career is the most critical task of our life. Being an Engineering student itself we have come across the problem of choosing the right domain and following the right path to become professionals. In order to find solution to this we have designed our project which is based on Full stack Development, ML and AI which would be of great help for all the technocrats varying from beginner level to the expert level.

We are building a learning website through which we will be introducing different technical domains to new developing technoheads and will help those users who already know their interested domain. Our website will categorize the users into different categories according to their current knowledge about his/her interested domain. Our website will be recommending courses after knowing the interested field and would be analyzing the consistency of the technocrat using Iris detection technology.

INTRODUCTION

Career Roadmap is the most important thing in any student's life. It helps him/her to select a path of life how he wants to pursue his life and earn money and have a good standard of life. Students need to explore today what they really want to do in future. They need to clarify whether they should follow the opinion of their father or mother, follow their friends or should they follow their own dream career.

Our project includes a learning website which would help the students to explore their interested domain and professionals to get expertise in their own domain through our recommended courses and consistency analyzing feature.

According to the user whether he/she is a beginner or professional we would be directing them to different pages. For beginners we would be providing a survey form through which using ML recommendation system we would be recommending courses to them. Our website would also analyze the consistency of the student using Iris detection (by AI). It will also help the users to maintain their consistency in the path of his/her career.

PROBLEM STATEMENT

- Career Counselling is the most important thing in any student's life. It helps him/her to select a path of life how he wants to pursue his life and earn money and have a good standard of life. Students need to explore today what they really want to do in future. They need to clarify whether they should follow the opinion of their father or mother, follow their friends or should they follow their own dream career.
- But only counselling is not enough but one also need to be analyze his/her growth during the polishing of their career. It is also important to analyze the progress of the user at each and every step .
- It is important to get reminders to maintain consistency of the user to excel in his/her career field.

OBJECTIVE

- To maintain the consistency of the student in the path of his/her career.
- To obtain a full time position in a reputed company/organization.
- To provide proper guidance from choosing the career to successfully fulfilling it.

LITERATURE REVIEW

1)A Systematic Review of Eye Tracking Research on Multimedia Learning

In [1] Lai et al., explained the use of eye tracking technology in learning studies. The authors classified studies with respect to various areas of cognitive development examined by eye tracking technology and the connections established between eye movement measures and several learning issues.

Eye tracking technology provides an online protocol allowing the study of attention processes, including “what is attended first and for how long, what is attended next and for how long, how much switching of attention is done between different components of the learning materials, what components are linked together during attentional switching” (Hyönä, 2010, p. 174). . Through eye tracking technology, two main types of measurements are obtained: fixations and saccades (van Gog & Jarodzka, 2013). Fixation describes the stable state of the eye at one point. According to the eye-mind hypothesis (Just & Carpenter, 1980), eye fixations reflect the attention process. Saccade describes quick eye movement between fixations, which shows the change in the focus of visual attention (van Gog & Jarodzka, 2013). Different specific measurements can be gathered for fixations and saccades. Lai et al. (2013) categorize them into three scales: temporal, spatial, and count. Temporal scale includes measurements that indicate time spent in specific eye movements. Total fixation duration, average fixation duration, and time to first fixation are some of the eye movement measurements in the temporal scale. Spatial scale includes measurements related to “locations, distances, directions, sequences, transactions, spatial arrangement or relationships of fixations or saccades” (Lai et al., 2013, p. 93). Examples of spatial scale measurements are saccade length and fixation sequence. Count scale includes measurements that indicate the frequency of specific eye movements. Total fixation count and inter-scanning count are two of the eye movement measurements in the count scale. In addition to fixations and saccades, pupil size and blink rate are other common eye movement measurements.

2)Eye-tracking methodology in mathematics education research: A systematic literature review

In [2] Strohmaier, Anselm R., et al. states that a key issue in online learning is to improve learners' engagement with their educational activities. Cognitive engagement refers to the thoughtfulness and willingness to exert the effort necessary to comprehend complex ideas and master difficult skills (e.g., focused attention, memory, and creative thinking. This paper presents a review of the state of the art of engagement detection methods in the context of online learning, and then it identifies the challenges of detecting engagement in online learning. We classify the existing methods into three main categories—automatic, semi-automatic and manual—considering the methods' dependencies on learners' participation. And, then the methods in each category are divided into subcategories based on the types of data used, e.g., audio, video, learner log data etc. In particular, the computer vision based methods in the automatic category that use facial expressions are examined. Part-based methods refer to the techniques that analyze different parts of a face (e.g., eyes, mouth, nose, forehead, chin and so on) for the engagement detection. A comprehensive way to analyze the parts of a face is the Facial Action Coding System (FACS). Ekman and Friesen (1978) is the pioneer in developing the FACS system for the analysis of facial expressions

Deep learning approaches have been used in engagement detection. Kaur et al. (2018) used LBP-TOP and Deep Multi-Instance Learning (DMIL) for engagement detection. Since the labeling of the engagements at frequent intervals in user videos is expensive and noisy, in this research study, the prediction and localization of learner engagement were formulated as a Multi-Instance Learning (MIL) problem and derived baseline scores based on DMIL.

3) Webcam-based online eye-tracking for behavioral research

In [3] Yang, Xiaozhi, and Ian Krajbich have stated that researchers have developed web-based eye-tracking applications (WebGazer; Papoutsaki et al., 2016) but they have yet to see them used in behavioral research. While online data collection has many advantages (e.g., speed, affordability), it has so far not been used to collect eye-tracking data in behavioral research. Eye-tracking has garnered a lot of interest in computer science have been working to improve the algorithms to determine gaze location (e.g., WebGazer, Papoutsaki et al., 2016; Smartphone eye-tracking. Here, we capitalize on these recent advances to investigate the possibility of bringing eye-tracking research online. We start with WebGazer, a JavaScript toolbox that was developed to monitor peoples' eye movements while on the internet (Papoutsaki et al., 2016). Until now, it has not been used in behavioral research, except in one methods article demonstrating some basic gaze properties (Semmelmann & Weigelt, 2018). An advantage of online eye-tracking is that it lowers the bar for researchers to use eye-tracking in their own work. To further improve accessibility, we seek to ease the programming requirements for using WebGazer in behavioral experiments. To that end, we integrate WebGazer into a user-friendly, open-source psychology toolbox called JsPsych (De Leeuw, 2015). JsPsych is built on JavaScript, includes a library of commands for behavioral experiments, and also allows for integration of JavaScript-based libraries such as WebGazer..

The experiment was programmed in JavaScript, based on the jsPsych and WebGazer libraries. To improve WebGazer's temporal resolution we removed some seemingly unnecessary computations that occur in each animation frame of a webpage. The original code calls the `getPrediction()` function at every animation frame to load the measured gaze location. This step is necessary when providing gaze-contingent feedback, but otherwise just consumes computational resources. These extra computations appear to gradually degrade WebGazer's temporal resolution. Subjects next had to pass an initial calibration + validation task . To assess spatial resolution over time, we examined the hit ratio for validation dots as the experiment went on. For each measurement, we calculated the Euclidean distance (in pixels) between the recorded gaze location and the center of the validation dot. If this distance was below a critical threshold (see Methods), we labeled the measurement a hit, otherwise we labeled it a miss. The hit ratio is simply the proportion of hits out of all the validation measurements .

4) REACTJS: AN OPEN SOURCE JAVASCRIPT LIBRARY FOR FRONT-END DEVELOPMENT

In [4] Islam Naim, Naimul states Internet has become a busy hub for searching information and doing different tasks virtually that used to be done manually before the internet age. There are enormous numbers of mobile and web applications that have made it easier to do different tasks. A big part of our everyday task can be done on the internet at the current age. Faster internet along with fast performing devices demands faster applications.

React was introduced to the world two years ago, and since then it has seen impressive growth, both inside and outside Facebook. New web projects at Facebook are commonly built using React in one form or another, and it is being broadly adopted across the industry. Developers and engineers are choosing React because it allows spending more time to focus more on the product development and less time spent on fighting and learning to the framework.

A React application is a collection of discrete components, each representing a single view. The idea of every individual view component makes it easy to iterate on product development because to make changes on a single view or component, it is not necessary to consider the entire system. When an application is built with React, the code is generally predictable, it is because React wraps the DOM mutative, imperative API with a declarative one, which raises the level of abstraction and simplifies the programming model. Moreover, it is easier to scale the application built with React. The combination of React and the rapid iteration cycle of the web, has enabled to make some excellent products including many Facebook components. An amazing JavaScript framework called Relay has also been made on top of React, which helps simplifying data fetching on a large scale.

5)ASSESSMENT OF SITE CLASSIFICATIONS ACCORDING TO LAYOUT TYPE IN WEB DEVELOPMENT

In [5] Tynchenko, V. S., et al states that CMS is a content management system. In modern realities, this is the most popular technical way to create websites. The advantages of this method include convenience, ease of learning, low financial costs and quick start-up. The essence of the CMS is the separation of the page content and its design. All content, settings and content are stored in a MySQL database for added convenience and security. The developer only needs to choose a template that will determine the appearance of the page. All that remains is to fill the page with the content. Thus, the CMS is great for creating template types of sites; however, it does a poor job when creating unique, non-trivial solutions in which you have to either make compromises or spend a lot of time introducing new features . Another type of sites that are created by combining ready-made templates, which are further filled with information, is sites made in designers. This method does not require special skills in creating sites and the help of specialists. However, this type of site is not without serious drawbacks. Among them, it is worth highlighting the high limitation in changing the functionality and design. The site will not be able to properly adapt, change the code, transfer to CMS. In addition, such site is quite difficult to promote in search engines, due to the meager functionality for optimization and features of the code

At the beginning of this article, we looked at the benefits of using websites. We studied them in order to start creating a site, one needs to decide on its functions, because with the help of them one can select the means for writing it, which are in this article. Some types of tools for writing a website are described. We considered site classifications by purpose, such as business card site, corporate site, portal, catalogue site, online store, landing page. Based on the available data, a table of the advantages and disadvantages of different types of websites is provided. The main stages of creating an online store were identified and described. These are a preparatory stage, preparation of technical specifications, marketing research, design, programming and layout, content filling, testing, domain and hosting selection. Conclusions were made about the conducted study, the advantages of an online store over conventional stores.

6)CURRENT AND FUTURE IMPACT OF ARTIFICIAL INTELLIGENCE: AN EMPLOYMENT PERSPECTIVE BASED ON CASE STUDIES

In [6] Jameel, Kiran, et al.states the study upon the topic, “Impact of Artificial Intelligence Application Based on Firms & Consultancy: A Case Study on Employment Perspective” strives to investigate the impact of Artificial Intelligence on manly Employment. The study has gathered the results through various case studies. The collection of case studies is accompanied by a review of previous studies, journal articles, reports, and surveys by market research consultancies, firms, and others. Qualitative analysis is done, which matches the interpretive research model and permits the illustration of general insights to tackle the research questions. The framework of the study is more comprehensive than deep, to counter the limitations and biases in choosing the cases. The study finds that in the upcoming times, AI will result in unemployment as other types of new technology did in the previous times, and hazardous social unrest will be triggered, possibly at an even rapid pace. If unemployment continues, the income gap between the poorest and the richest will get even broader. However, this study also suggests various recommendations to avoid the worst effects of AI on employment.

Artificial intelligence technologies are evolving rapidly, with many possible benefits for individuals, economies, communities, and societies. Realizing their value requires achieving such benefits as broadly as possible, as quickly as possible and with the smoothest possible transition. AI has the potential to provide expansive productivity and long term industrial links moving forward (West, 2015). Many major industries of the world, including retail, manufacturing and entertainment, are already using AI advancements to enhance their reach and effectiveness. In the recent times, AI technology leads to global mechanization in distinct fields and intelligent machines can carry out more and more non-standard jobs like enhancing the efficacy of e-commerce projects or handling lines of production in heavy industries (Hagendorff, 2020). This tendency leads to the emergence of practical concerns regarding the complete substitution of human beings by intelligent systems of machines in job roles.

The research will explore the phenomenon that if due to AI; displacement and losses of jobs are happening in the short term and while over the longer term; if wealth, productivity, and employment all tend to increase.

7) THE APPLICATION OF MACHINE LEARNING TO EDUCATION

In[7] Ma, Alan states that Machine learning is the field of study that allows tasks. The applications of machine learning are computers to learn what they have to do, instead numerous, with major companies and organizations of being programmed explicitly to complete specific relying on it to complete complex data analysis. From

machine vision and autonomous vehicles to spam classifiers and natural language processing, the range of what machine learning can be applied to is constantly growing (Ng, 2011). The usage of state-of the art technology in the educational field can lead to new ways of advancing the way that students are taught. Being able to compile all of the data that the education field has collected over its long history is a necessary step that can improve student learning (Bernhardt, 2009).

There is a necessity to improve students' foundations in math and science. Ontario's students are faring well in reading and writing, with 92% of students meeting or exceeding the benchmark established by the Programme for International Student Assessment (PISA). However, students are lacking in both math and science, as 13 jurisdictions are ranked above Ontario in PISA's assessments in math and science (Jackson, 2010). In order to improve these statistics, there needs to be a change in how students are taught.

8) DEEP LEARNING IN FIELD OF EDUCATION

In [8] Yong, Binbin, et al. states the analysis field of Educational Data Mining focuses on the applying of techniques and strategic of data mining in educational environments. EDM is concerned with researching, developing, and applying machine learning, data processing, and applied math strategies to notice patterns in giant collections of educational data that will preferable be not possible to research [1].

EDM leverages e-learning platforms like Learning Management System (LMS), Intelligent Tutoring Systems (ITS), and, within the last years, huge Open on-line Courses (MOOC), to get made and multi modal data from student's learning activities in academic settings. For instance, these platforms record when the students access a learning object, how many times they accessed it, whether the answer provided to an exercise is correct or not, or the amount of time spent reading a text or watching a video.

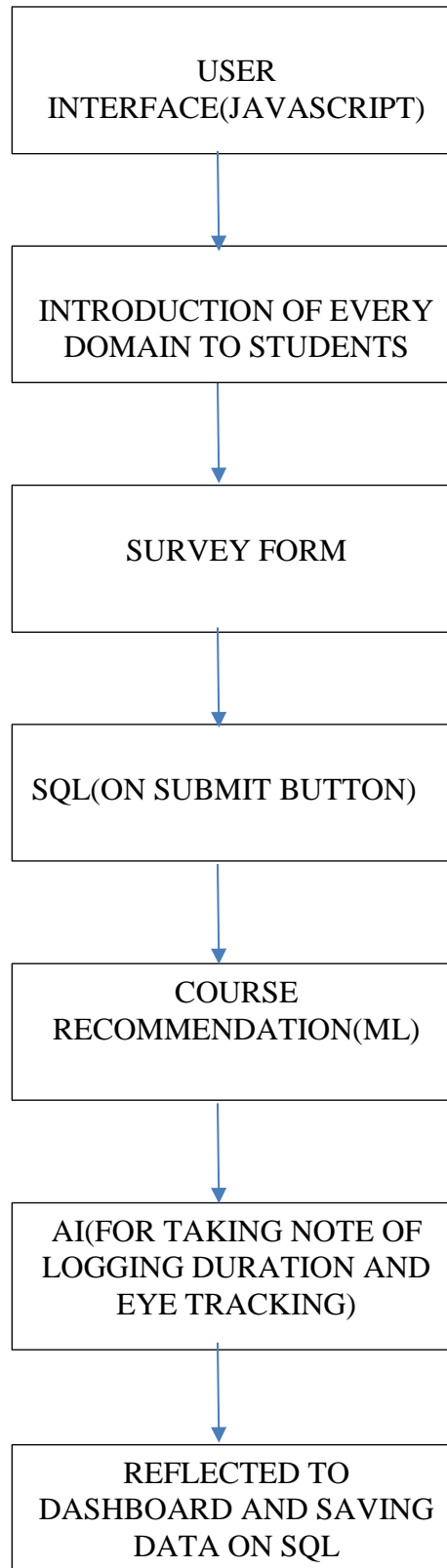
All this data will be analyzed to handle completely different educational problem, like generating recommendations, developing adaptive systems, and providing automatic grading for the students' assignments. completely Different machine learning techniques have been applied over time to research this information, however it's been in recent years that the utilization of Deep Learning techniques has emerged within the field of EDM.

9) SQL AND NOSQL DATABASES

In [9] Sharma, Vatika, and Meenu Dave states NoSQL stands for Not Only SQL. It is pronounced as noseequel. It is one of the another type of data storage other than databases (that were used earlier) that is used to store huge amount of data storage like data in facebook (which keeps on increasing day by day). NoSQL is a non-relational database management system (sometimes called as derived from relational database), fast information retrieval database and is portable. NoSQL basically derives from RDB database system. This database usually interacts with the UNIX operating system. NoSQL databases are those databases that are non-relational, open source, distributed in nature as well as it is having high performance in a linear way that is horizontally scalable. Non-relational database does not organize its data in related tables (i.e., data is stored in a non-normalized way). NoSQL databases are open source; therefore, everyone can look into its code freely, update it according to his needs and compile it. Distributed means data is spread to different machines and is managed by different machines so here it uses the concept of data replication.

METHODOLOGY

FLOWCHART



ALGORITHM PROPOSED

- Create the website using HTML,CSS,Javascript and React.js.
- Storing information of the user using Node.js.
- Implementation of database using SQL.
- Course Recommendation System Using ML.
- Monitoring the presence of user using Eye Tracking in AI.

TECHNOLOGY USED

1-WEB DEVELOPMENT

- HTML
- CSS
- Javascript
- React
- SQL
- Node.js

2-MACHINE LEARNING

- K-Nearest Neighbors

3-ARTIFICIAL INTELLIGENCE

- Eye Tracking

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