**School of Computer Science & Engineering**

**Department of Computer Science and Applications**

**2024-2025**

**Synopsis**

**On**

**“Adaptive Mentor”**

**Project Based Learning**

**Course Code: BSC2PR01A**

**Second Year BSc Computer Science**

**Year: 2024-2025**

**Group Id:**

Team Leader: **Khushi Hinge**

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Project Title: **Adaptive Mentor**

Name of the Mentor: **Mungunthan Rajan Sir**

**Adaptive Mentor**

***Introduction***

We're developing a website that serves as a customized educational tool, integrating components like a microprocessor, C programming language, and HTML. The core idea is to create a personalized learning experience for each user. The learning assistant begins by assessing the type of learner you are whether visual, auditory, or hands on learner, and it tailors the lessons accordingly.

To make this even more effective, the system will incorporate advanced tracking technologies, including motion tracking and eye tracking sensors. These sensors monitor the student's physical responses and engagement levels during lessons. For instance, if the system detects that a student is losing focus or isn't engaging with the material, it can adjust the lesson's difficulty, format, or pacing in real-time to better suit the student's needs.

Data collection is a key part of this process. By gathering and analyzing information on the student's learning patterns like how long they spend on a particular type of content, or how they respond to different teaching methods the system can continuously refine the educational experience. This dynamic adjustment ensures that the content remains both challenging and accessible, helping students to progress more efficiently.

In essence, this project aims to create an intelligent learning environment that not only adapts to individual learning styles but also evolves with the learner, providing a more effective and personalized educational journey.

***Objective***

* **Personalized Learning**: The tool trains educational content to match each student's unique learning style, making lessons more relevant and engaging.
* **Continuous Monitoring**: It uses sensors to track student progress, gathering real-time data on how they interact with the material.
* **Dynamic Adjustments**: The system adjusts the difficulty and format of lessons based on the student's current performance and engagement levels.
* **Sensor Integration**: Motion and eye-tracking sensors help monitor focus and physical responses, providing deeper insights into the student's learning process.
* **Learning Pattern Analysis**: By analyzing the data collected, the tool identifies patterns in the student's learning behavior and adapts accordingly.
* **Real-Time Feedback**: The system provides immediate feedback to the student, helping them understand areas of strength and those that need improvement.
* **Enhanced Engagement**: By offering content that matches their learning style and pace, students are more likely to stay engaged and motivated.
* **Progress Tracking**: The tool keeps a detailed record of the student's progress over time, making it easier to identify growth and areas needing attention.

***Feasibility Study***

The feasibility of this project is high, given the availability of advanced sensors, data analysis tools, and adaptive learning algorithms. Integrating these technologies into an educational tool is achievable with current microprocessors and programming languages like C and HTML.

The need for this project is significant, as personalized learning enhances student engagement and success. Traditional one-size-fits-all teaching methods often fail to address individual needs. This tool’s ability to adapt to each student’s learning style and progress ensures a more effective and personalized educational experience, making it a valuable addition to modern education systems.

***Methodology/Planning of Work***

The methodology of this project involves several key steps. First, the system will assess each student's learning style using initial tests or activities. Then, sensors like motion and eye trackers will be integrated to monitor the student's engagement during lessons. The data collected from these sensors will be analyzed to identify patterns in the student's learning behavior. Based on this analysis, the system will dynamically adjust the content's difficulty, format, and pacing to match the student's needs. The programming and web development aspects will involve using C language for backend processes and HTML for the user interface.

*The above project is an* ***application-based project****. While it may involve some research, the primary focus is on developing and implementing a functional system that applies existing technologies—such as sensors, adaptive algorithms, and programming languages—to create a personalized learning tool. The goal is to build a practical, working application that can be used in real-world educational settings, rather than primarily conducting new research or generating new knowledge.*

***Software/Hardware requirements***

C++ would be used for data processing, while the web interface, created with HTML, would present the learning material interactively and Microprocessor will be used for eye sensors and motion sensors

***Benefits of the project for the society***

This project benefits society by making education more personalized and effective. It adapts to each student's learning style, helping them understand and retain information better. By improving educational outcomes, it supports individual growth and can lead to a more skilled and knowledgeable population, benefiting communities as a whole.

***Bibliography***

DevCommunity

GeeksForGeeks