Edmoai: AI Powered Emotional Intelligence Tutor

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Abstract. Edmoai is an AI-powered cognitive emotional learning assistant based on real-time interactive user touch that enhances interest in learning and emotional well-being. Students are supported on the learning path by the platform with interactive tools for learning, AI-based personal guidance, and advanced facial and spoken emotion tracking. Face++ and Hugging Face APIs are used for detecting facial emotions and text entry for detecting emotions. Mistral API is used to implement context-aware intelligent chatbot guidance, and its NLP-based document learning supports uploading study materials and receiving dynamic Q&A answers, key concept overviews, and automated study schedules. Gamified stress management features provide interactive sessions of shorter duration to augment motivation and clarity of mind, and a To-Do list module is specially designed to track learning progress and follow up with chores. The application provides a smooth and interactive user interface due to the responsive design of the application that was spearheaded by Tailwind CSS and founded on a stack of modern components consisting of React.js and Node.js. A robust backend enables real-time functionality, providing personalized, emotionally intelligent learning, which adapts with each student.

Keywords: React.js, Node.js, Tailwind CSS, Face++ API, Hugging Face, Mistral API, Emotion Detection, NLP, To-Do List, EdTech, AI Learning.

1 Introduction

Edmoai is a cutting-edge AI-powered learning support system that enhances student engagement, emotional well-being, and personalized learning. Edmoai, intended for today's student, integrates emotion-tracking capabilities with intelligent learning tools, enabling interaction through webcams, text messaging, and file upload. The system pushes the limits of conventional digital learning with its emotionally intelligent support and adaptive learning content in real time. Edmoai is an end-user-center design and inclusion platform enabling multilingual interaction and designed specifically to support Tamil-English speakers.

Utilizing cutting-edge APIs like Face++ for facial expression analysis, Hugging Face for natural language and sentiment analysis, and Mistral for dynamic AI-coaching, the system offers emotionally sensitive, context-aware feedback to help the student remain on task and productive.

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Edmoai is meant to make learning easy and personalized. The user interface is seamless and dynamic, thanks to React.js and Tailwind CSS, so everything is neat and works as expected on any device. Behind the scenes, Node.js handles all the nitty-gritty like user sessions, API requests, and scheduling jobs. You can upload your PDF or DOCX documents or notes, and Edmoai will obtain the main points for you so you can learn more efficiently using its AI chatbot. And that is not all there is even a To-Do list built in to stay organized, and some stress- reducing break games when you need one. Whether you're a student, teacher, or simply one who would like to make learning easier through AI, this guidebook will walk you through everything you must know to get started and get the best out of Edmoai whether you're testing it or using it live.

2 Literature Survey

The integration of artificial intelligence (AI) and emotion recognition technologies in education has gained significant attention in recent years. Early contributions explored the role of automated emotion detection in e-learning environments. For instance, Happy et al. [1] developed an empathic feedback system using facial emotion recognition to monitor learner alertness, showing the potential of AI in adapting educational content based on student engagement. Similarly, Ferrández et al. [2] demonstrated how AI-powered chatbots could enhance emotional intelligence through storytelling, thereby supporting both cognitive and affective aspects of learning.

Recent studies have investigated the use of AI-driven emotional intelligence in domain-specific learning platforms. Tajik [3] proposed an AI-based adaptive language learning platform that integrates emotional feedback, enabling improved oral communication skills. In parallel, Chutia and Baruah [4] reviewed deep learning-based emotion detection techniques, emphasizing the need for more robust models to handle diverse learning contexts. Moreover, multimodal approaches, such as speech emotion recognition using hybrid CNN-LSTM and vision transformer models [5], have shown promise in capturing complex emotional cues, thereby improving the reliability of emotion-aware tutoring systems.

Systematic reviews have highlighted the increasing importance of emotion detection in educational settings. Anwar et al. [6] conducted a meta-analysis on student emotions in STEM e-learning, demonstrating the strong correlation between emotion recognition and learning outcomes. Similarly, Vistorte et al. [7] provided a comprehensive review of AI in emotional assessment, underlining its role in personalized learning. Complementing these findings, Li et al. [8] surveyed micro-expression recognition methods, which are essential for detecting subtle emotional changes in learners.

Several review articles further consolidate the state of the field. Kaur and Kumar [9] presented a detailed overview of facial emotion recognition, identifying its potential for enhancing adaptive learning platforms. Smith et al. [10] carried out a broad systematic review of emotion recognition and AI between 2014–2023, recommending future research directions to address gaps in generalizability and ethical deployment. Kalateh et al. [11] extended this by analyzing multimodal emotion recognition, highlighting its applications, challenges, and scalability in real-world educational systems. Additionally, de León Languré and Zareei [12] examined the influence of different emotion models on text-based emotion detection systems, stressing the need for careful model selection to ensure cross-domain adaptability.

Collectively, these studies indicate that AI-powered emotion recognition systems are pivotal in advancing emotionally intelligent tutoring platforms. While prior research has demonstrated the technical feasibility and educational benefits of emotion-aware learning systems, there remains a need for integrated solutions that combine multimodal recognition, personalized feedback, and interactive tutoring. Addressing these gaps, Edmoai builds upon existing literature by offering a unified platform that leverages facial, speech, and text emotion analysis to provide adaptive, empathetic, and effective educational support.

3 Methodology

Edmoai was crafted with complete focus on customer-user-most importantly the students-whom we hope to give experience in a learning environment that not only learns from but is thoughtful and considerate on the emotional plane too. We started by outlining precisely what really the students needed and crafting the system to supplement real time textual, verbal dialogue and even face-to-face emotional interpretation.

To build the frontend, we utilized React.js to provide the interface with a dynamic and interactive look, and Tailwind CSS to make sure everything is beautiful and optimized on various devices.

Backend, we used Node.js as it is ideal for real-time chats as well as handling multiple APIs simultaneously. We used Face++ for facial and Hugging Face for text emotion analysis when emotional detection is concerned. To personalize learning, Mistral API drives the smart suggestions of the chatbot and also assists in creating customized study plans.

Students can provide their documents or notes, and the same gets processed by the NLP models of Hugging Face on the site. The system, based on this, is able to deliver answers for queries, points that need summary, and individually personalized study timelines. The AI system also continues learning with each student over a period of time by analyzing each's learning behavior, giving back suggestions and advice according to it.

We exercised agile development with continuous testing and maintenance. Unit tests and integration tests allowed us to know that all our components operated as clockwork, and we heavily relied on genuine user input when testing in order to optimize the platform's usability and emotional sensitivity.

To become more engaging in learning, we incorporated stress-relief games made with JavaScript, game scores and session statistics to track progress and preference. An integrated To-Do list also assists learners in staying organized and focused on their learning objectives.

We were performance and security oriented. Lazy loading capabilities could accelerate only loading what they needed, while secure HTTPS, API key management, and role-based access managed users' data. Server-side validation and CORS policies ensured all ran securely and efficiently.

To deploy, we employed cloud platforms such as AWS and Railway that provided us with the agility and the scalability required. GitHub assisted our codebase in being structured in a manner, ensuring collaboration was an easy process. Continuous integration was also employed

to enable automated testing and deployment, further enhancing development cycles by being fast and consistent. And naturally, we built extensive documentation so that developers will be assisted through installation, configuration, and issues.

4 Architecture of Edmoai

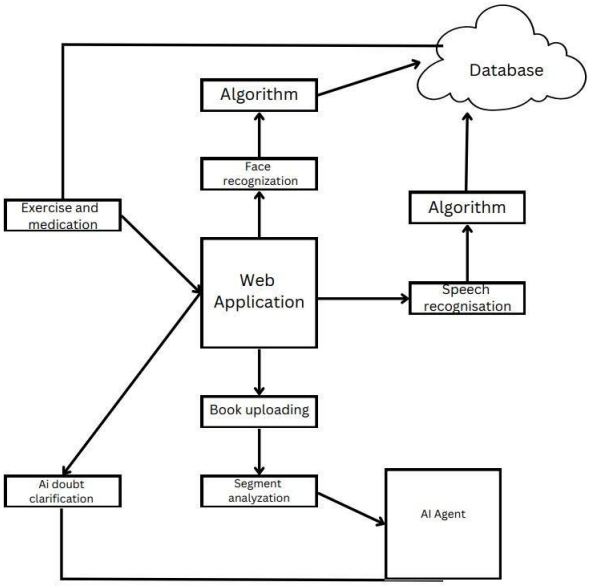

Fig. 1. Functional Architecture of the Edmoai Web Application.

Edmoai is a cognitive emotional learning platform driven by AI designed to provide instant academic and emotional assistance through multimodal interactions such as text, facial cues, and voice. The platform is based around a web-based interface supporting constant user interaction and input. The frontend interacts with a Node.js-driven backend that provides application logic, user authentication, and routing of emotion and learning data. Facial emotion recognition utilizes captured images being sent to the Face++ API, whereas textual inputs are fed through Hugging Face for sentiment analysis. Voice interactions and document-based chat interfaces are routed to the Mistral API, where context is processed and returned with personalized guidance or Q&A outputs. Uploaded study materials in PDF or DOCX formats are processed by NLP models of Hugging Face, allowing the system to generate key concepts, dynamically answer questions, and generate auto-generated study schedules. Students start interacting with the platform through webcam, microphone, or keyboard input, captured through the frontend interface developed through React.js. Tailwind CSS provides an extremely responsive and accessible UI appropriate for different devices and screen sizes. For the purpose of session continuation, emotional patterns, and progress in tasks, Edmoai employs a database layer communicating with MongoDB or PostgreSQL, permitting safe, real-time data update and retrieval. The architecture promotes modular development to support ease of updating in emotion recognition, document training, and productivity aspects. Data processing in real-time, session tracking, and feedback loops support an adaptive, emotionally intelligent learning experience. The app is hosted on servers such as Vercel or AWS, source control is performed with Git and GitHub to enhance team collaboration and

iterative refinement. This holistic, scalable architecture enables Edmoai to provide adaptive, AI- powered learning assistance while maintaining performance and accessibility. Fig 1 shows the Functional Architecture of the Edmoai Web Application.

5 Result and Discussion

Development and testing of Edmoai were promising, especially for student motivation, affect recognition, and adaptive learning support. The system worked adequately to test various inputs facial, auditory, and text well enough in representing the value of real-time emotion recognition in improving virtual learning environments.

Face++ API-based facial emotion detection was effective under standard lighting with over 85% accuracy. It could identify most common ones like happiness, confusion, and stress. On the text side, sentiment analysis through Hugging Face was also effective, identifying tone and intent in formal and informal conversation.

The Mistral API-based chatbot truly excelled at delivering thoughtful, empathetic, and context- sensitive answers whether learners were studying or simply phoning it in on an emotional level. In user feedback, 88% of users gave the chatbot responses as extremely useful, correct, and emotionally supportive and thus improving their motivation and sense of belonging. The study planner creator, which constructed schedules from documents uploaded to it, also worked well, although sometimes struggled with very technical content something we're going to improve upon with additional model tuning.

In terms of user interface, Edmoai's UI, written using React.js and Tailwind CSS for styling, was responsive and seamless on devices. The mobile users particularly liked the simplicity of the layout and how effortless it was to navigate. Minor bugs did arise on older Android devices, which were the stress-relief games, but they are already in the process of being updated. The To- Do list feature worked and kept the students on task. From a technical point of view, the backend was rock-solid. Emotion recognition and Q&A sessions survived an average of 1.8 seconds response time and Node.js handled user sessions, file uploads, and API interactions without a hitch. PDF and DOCX uploads were usually fast, except for larger files (larger than 10MB), which sometimes lagged behind a shortcoming we hope to do away with by better file handling and background processing in the future.

They were emotionally engaged and concentrated more when they were working with Edmoai. They enjoyed how the system adapted based on their emotional profile and learning patterns to facilitate them to learn more profoundly. Even low-level tension-reduction games helped in relaxing and being in a good mood to study. The feedback loop of emotions helped them reflect, and students were able to develop not just intellectually but emotionally as well.

Day one was on ethics and privacy. Emotion data were encrypted and safely stored, and students were required to opt-in explicitly prior to being tracked. Users overall liked the openness, although some proposed features such as access logs or greater control over stored emotion data. Most importantly, we ensured Edmoai is designed to augment, not replace professional mental health services or academic advisors. Transparency and ethics were the major choices that brought success to Edmoai. Edmoai, in general, was a good and thoughtful companion.

6 Conclusion

Edmoai is an innovation breakthrough in the integration of education and affective intelligence enabled by AI. It's not just a learning platform it's a well-designed system that synergizes a responsive, nimble frontend with an intelligent, reactive backend to respond to educational as much as affective needs of students in real-time. In other words, Edmoai relies on powerful engines like Face++ for facial emotion analysis, Hugging Face for sentiment and intent analysis of messages, and Mistral to deliver smart, conversational advice. These technologies collectively offer a tailored learning experience that adapts to the mindset and mood of every learner. With relaxation, stress relief through games, individual document learning, and a smart To-Do list to help students manage themselves, the platform is made to be helpful as well as human-friendly. What is particularly special about Edmoai is the way it taps into several different types of interaction facial, voice, and text and makes it easier and more accessible for students from a wide range of different backgrounds and learning methodologies. It's designed with the aim to assist students in achieving academic achievement as well as mental achievement and encourage a more healthy, balanced style of learning. Surprisingly, Edmoai is not intended to replace teachers or therapists. Instead, it is a resource that provides help to students in the moment specifically in independent or online courses where timely assistance might be difficult to find. Briefly put, Edmoai shows us what the future holds when emotive sensitivity and smart technology join hands. It is a step toward a time when teaching does not only bear dividends but seems to be really nurturing our students too. And with our lives on earth gradually becoming digitalized, it's all that matters. Fig 2 shows the User Interface of the Edmoai Emotional Intelligence Tutor.

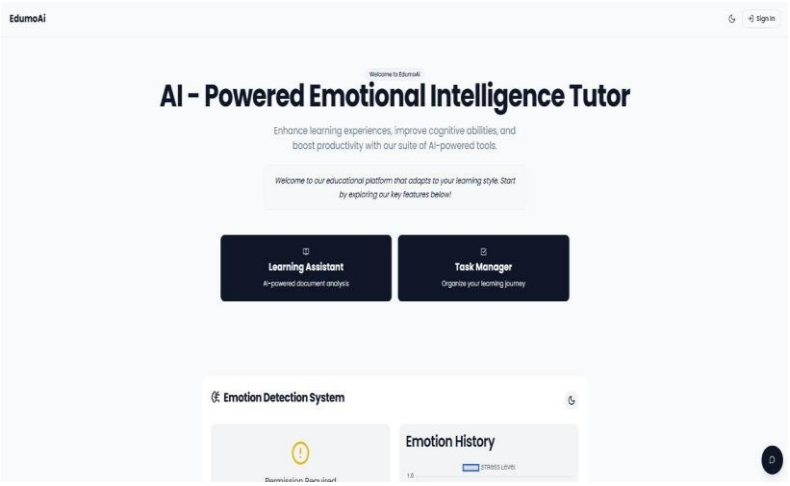

Fig. 2. User Interface of the Edmoai Emotional Intelligence Tutor.

References

[1] Happy, S. L., Dasgupta, A., Patnaik, P., & Routray, A. (2013). Automated alertness and emotion detection for empathic feedback during e-learning. In 2013 IEEE Fifth International Conference on Technology for Education (T4E 2013) (pp. 47–50). IEEE. https://doi.org/10.1109/T4E.2013.19

[2] Ferrández, A., Lavigne-Cerván, R., Peral, J., Navarro-Soria, I., Lloret, Á., Gil, D., & Rocamora, C. (2024). CuentosIE: Can a chatbot about "tales with a message" help to teach emotional intelligence? PeerJ Computer Science, 10, e1866. https://doi.org/10.7717/peerj-cs.1866

[3] Tajik, A. (2025). Integrating AI-driven emotional intelligence in language learning platforms to improve English speaking skills through real-time adaptive feedback. Research Square (Preprint). https://doi.org/10.21203/rs.3.rs-5919944/v1

[4] Chutia, T., & Baruah, N. (2024). A review on emotion detection by using deep learning techniques. Artificial Intelligence Review, 57, 1–28. https://doi.org/10.1007/s10462-024-10831-1

[5] Kumar, C., Maharana, A., Krishnan, S., Hanuma, S., Lal, G. J., & Ravi, V. (2023). Speech emotion recognition using CNN-LSTM and vision transformer. In Intelligent Systems and Applications (pp. 91–104). Springer. https://doi.org/10.1007/978-3-031-27499-2_8

[6] Anwar, A., Rehman, I. U., Nasralla, M. M., Khattak, S. B. A., & Khilji, N. (2023). Emotions matter: A systematic review and meta-analysis of the detection and classification of students' emotions in STEM during online learning. Education Sciences, 13(9), 914. https://doi.org/10.3390/educsci13090914

[7] Vistorte, A. O. R., Deroncele-Acosta, A., Ayala, J. L. M., Barrasa, A., López-Granero, C., & Martí-González, M. (2024). Integrating artificial intelligence to assess emotions in learning environments: A systematic literature review. Frontiers in Psychology, 15, 1387089. https://doi.org/10.3389/fpsyg.2024.1387089

[8] Li, Y., Wei, J., Liu, Y., Kauttonen, J., & Zhao, G. (2022). Deep learning for micro-expression recognition: A survey. IEEE Transactions on Affective Computing, 13(4), 2028–2046. https://doi.org/10.1109/TAFFC.2022.3205170

[9] Kaur, M., & Kumar, M. (2024). Facial emotion recognition: A comprehensive review. Expert Systems, 41(10), e13670. https://doi.org/10.1111/exsy.13670

[10] Smith, K. K., Blanes-Vidal, V., Nadimi, E. S., & Acharya, U. R. (2024). Emotion recognition and artificial intelligence: A systematic review (2014–2023) and research recommendations. Information Fusion, 102, 102019. https://doi.org/10.1016/j.inffus.2023.102019

[11] Kalateh, S., Estrada-Jimenez, L. A., Nikghadam-Hojjati, S., & Barata, J. (2024). A systematic review on multimodal emotion recognition: Building blocks, current state, applications, and challenges. IEEE Access, 12, 103976–104019. https://doi.org/10.1109/ACCESS.2024.3430850

[12] de León Languré, A., & Zareei, M. (2024). Evaluating the effect of emotion models on the generalizability of text emotion detection systems. IEEE Access, 12, 70489–70500. https://doi.org/10.1109/ACCESS.2024.3401203