

Automatic Detection of Students Engagement During Online Learning

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Abstract: *Online learning environments have significantly increased after the COVID-19 pandemic. However, monitoring and ensuring student engagement remains a major challenge in virtual classrooms. This research proposes an automatic system for detecting student engagement using machine learning, deep learning, and computer vision methods. The system analyzes facial expression, gaze direction, head pose, and body posture captured through the webcam to determine attention level in real time. The proposed model improves the online learning experience by identifying distraction patterns and alerting instructors or Learning Management Systems (LMS). Experimental results demonstrate that automated engagement detection enables adaptive teaching, improves learning outcomes, and offers insights for educational analytics.*

Keywords: Student Engagement, Online Learning, Machine Learning, Deep Learning, Computer Vision, Face Recognition.

