Deep Learning Based Student Attention Monitoring and Alerting System During a Lecture

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Mindfulness is the ability to fully aware and focuses on the present moment. For students, it is essential to pay full concentration during the lectures. Staying focused while studying is vital for the better performance of any student. In this study, focuses on developing a deep learning-based attention monitoring and alerting system. The proposed system monitors attention of students during a lecture and gives an alert when attention is diverted. The study used mainly three aspects namely Heart Rate Variability, Brain Waves and Facial Expressions to capture the attention level of students while attending a lecture. By using three different aspects, it is expected to overcome the limitations of each aspect. Each aspect is further divided into several parameters, and most significant parameters that respond to the loose of students' concentration was chosen using principal component analysis to train the deep neural network to measure the students' concentration level. As the parameters cannot be able to label accurately with concentration, study used an unsupervised learning methodology and it considers the concentration drifting moment as an anomaly and detect it by deducing the pattern of the parameters. When the concentration drops below the threshold system will alert the user. The preliminary experiments reveal how the Facial Expressions, Heart Rate Variability and Brain Waves change with students' concentration.

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