

An Automated Student Attendance System Based on Face Recognition using Deep Learning

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Abstract

Manual attendance systems take more time and are prone to proxy attendance and human mistake. This study suggests a deep learning-based automated student attendance system that uses facial recognition to get around these restrictions. For precise multi-face identification, the system incorporates a Multi-Task Cascaded Convolutional Neural Network, and used for discriminative facial feature extraction, it uses a pre-trained FaceNet model. Three facial postures (frontal, left, and right) were used to represent each of the 84 students in the custom dataset. In real-time classroom assessment, FaceNet is used to align and transform observed faces into 128-dimensional embeddings. Cosine similarity is used to compare these embeddings with reference embeddings that have been saved in order to automatically identify students and record attendance. The suggested method achieves an overall accuracy of 93.88%, according to experimental data, with precision, recall, and F1-score values for same person are 0.86, 0.90, 0.88 and for different person 0.89, 0.86, 0.87 respectively. Digital attendance records saved automatically. The outcomes demonstrate that the suggested method offers a dependable, scalable, and effective way to control attendance in smart classrooms.

Index Terms

Deep Learning, Face Recognition, Automated Attendance System, MTCNN, FaceNet, Cosine Similarity, Biometric Identification, Smart Classroom