Anti-Plagiarism System for Exam Monitoring

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Abstract—Academic integrity represents a fundamental challenge in modern education systems, with plagiarism rates increasing globally across all educational levels. Traditional exam monitoring approaches rely primarily on screen surveillance and human oversight, creating significant vulnerabilities in detecting sophisticated cheating behaviors during online and remote examinations. This research develops a comprehensive anti-plagiarism monitoring system using deep learning and computer vision technologies to address these limitations. The system integrates gaze tracking algorithms with YOLO-based object detection models through a modular software architecture. Facial landmark detection enables precise gaze direction analysis, while specialized convolutional neural networks identify unauthorized objects and suspicious materials in the examination environment. These two complementary approaches work together to provide comprehensive monitoring coverage: gaze analysis detects abnormal visual attention patterns that may indicate unauthorized assistance seeking, while object detection identifies physical cheating aids such as smartphones and smartwatches. Experimental testing demonstrates effective operation on CPU-based systems, identifying suspicious gaze patterns, abnormal behaviors, and unauthorized objects while maintaining real-time performance. The system provides comprehensive exam monitoring capabilities suitable for educational institutions, enabling widespread deployment using standard computing hardware without requiring specialized equipment.

Index Terms—Academic integrity, Educational technology, Computer vision, Gaze tracking, Object detection, Real-time systems, Machine learning, Convolutional neural networks, Image processing, Kalman Filters