

Smart GATE Exam Preparation System with AI-Based Object Detection and Monitoring

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Abstract: *The increasing adoption of online learning and remote examinations has created a strong demand for secure, intelligent, and user-friendly platforms for competitive exam preparation. This paper presents an integrated AI-powered GATE Preparation and Proctored Exam System that combines three major components—an intelligent chatbot for personalized learning assistance, a secure proctored examination environment using YOLOv3 object detection, and a resource management system that provides video lectures, notes, and previous year question papers. The proposed system ensures exam integrity by detecting prohibited objects such as books, mobile phones, and multiple persons during assessments in real time. The chatbot, developed using natural language processing (NLP) techniques, enables students to resolve queries efficiently and interact naturally with the system. The data preprocessing module enhances object detection accuracy by including diverse environmental conditions, while the YOLOv8 model ensures high detection precision and minimal latency. Experimental evaluations show that the model achieves over 94% detection accuracy with a fast inference rate, ensuring smooth exam monitoring. The system thus provides a comprehensive AI-driven learning and assessment platform, improving both student engagement and examination transparency in the context of competitive test preparation.*

Keywords: ATE Examination, Artificial Intelligence, Chatbot, YOLOv3, Object Detection, Online Proctoring, Deep Learning, Computer Vision, NLP, E-Learning, Python, Secure Examination System, Educational Resources, Video Lectures, Study Notes

