Hazard Detection in Construction Sites using YOLOv8

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Abstract

Accidents occurring on construction sites are a significant problem due to hazardous conditions and insufficient real-time monitoring. This initiative seeks to improve safety by incorporating YOLOv8 to detect objects and OpenCV to recognize faces. YOLOv8 identifies dangers such as heavy equipment, open excavations, and workers' compliance with PPE regulations through live video feeds. At the same time, OpenCV checks for authorized individuals in restricted zones. If a breach happens, like an employee not utilizing PPE or unauthorized individuals accessing a restricted area, the system forwards an email alert to the manager containing details of the violation. Django is utilized to oversee data flow and support a web- based dashboard for ongoing monitoring and historical analysis. This system minimizes risks and accidents by merging real-time hazard detection and personnel verification.

Keywords

YOLOv8, Object Detection, Construction Safety, OpenCV, Django, Real-time Monitoring, Hazard Detection, Personnel Verification.