Visual Intelligence Driven UAV Based Construction Monitoring System: A Comprehensive Review

T Gunawardhana[1#] and MWP Maduranga[1]

[1]Faculty of Computing, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka

[#]38-bce-0018@kdu.ac.lk

Abstract

The importance of the construction industry is highlighted by its growing reliance on cutting-edge technologies. The new applications of computer vision, deep learning, image processing, and unmanned aerial vehicles (UAVs) in construction site monitoring are examined in this review paper, with a focus on the integration of YOLOv for real-time object recognition and image processing for fire detection. The research delves into critical aspects such as Vehicle Detection and Counting, Artificial Intelligence/ Machine Learning-based Object Detection algorithms, worker safety considerations, identification of construction site resources, and the implementation of Fire Detection and Prevention systems. While acknowledging the strides made in enhancing safety and efficiency through innovative monitoring systems, challenges persist, particularly in addressing worker safety concerns, preventing avoidable accidents, and optimizing labour organization and resource management. Furthermore, adding fire detection algorithms to the mix provides yet another level of risk reduction. This paper serves as a valuable resource for researchers, business executives, and representatives navigating the complex landscape of construction management and safety. It highlights the ongoing advancements and outlines unresolved issues, fostering informed decision-making in the rapidly evolving construction industry.

Keywords: *Construction site monitoring, Unmanned aerial vehicles, Visual intelligence, Computer vision, YOLOv*