AI-Powered Real-Time Livestock Management: An Advanced Approach Using YOLOv9 and Computer Vision

Ms. Sumedha Meher, Prof. Mrs. Shubhangi Said, Prof. Dr. Anand Khatri

ME AI & DS Engineering

Jaihind College of Engineering, Kuran, India

Abstract*: Efficient livestock management is vital for modern agriculture, yet traditional methods of counting and monitoring livestock remain labour- intensive and error-prone. This research introduces an AI-powered real-time livestock counting system utilizing the YOLOv9 object detection algorithm. The system automates the detection and counting of cattle and sheep in dynamic farm environments, addressing challenges such as varying lighting, animal movement, and occlusions. Key features include anomaly detection to monitor animal behaviour and health, offering actionable insights for improved farm management. The system is scalable, deployable on embedded platforms like Raspberry Pi, and integrates seamlessly with existing farm management tools, making it cost- effective and accessible for farms of various sizes. Experimental results highlight the system's high accuracy, efficiency, and robustness, demonstrating its potential to revolutionize precision agriculture by optimizing resource use, improving animal welfare, and enabling data-driven decision-making.*

Keywords: Histogram- YOLO-v9 , Computer Vision , Real-time Processing , Object Detection , Livestock Counting, Embedded Systems, Anomaly Detection, Deep Learning