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SentinelEye: ML-Based Wild Animal Intrusion Detection System Using Raspberry Pi – A Review

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Abstract: *The frequent intrusion of wild animals into farms, city outskirts, and public spaces often leads to crop destruction, property loss, and potential threats to human safety. Traditional preventive methods such as fencing, manual patrolling, and CCTV surveillance are often costly, inconsistent, or limited in range. To address these challenges, this project proposes an intelligent Farm Animal Intrusion Detection System built using Raspberry Pi, camera modules, and IoT-based alert mechanisms powered by machine learning.Unlike conventional video surveillance systems, this solution operates on image-based detection. The camera periodically captures still images and transmits them to a trained deep learning model—using YOLO or CNN architectures—for real-time identification and classification of animals. When an intrusion is detected, the system triggers animal-specific sound alarms to drive them away and immediately sends SMS alerts to farmers or forest officials, including details such as the animal type, location, and time. All captured images and detection records are securely stored either locally or in the cloud for future reference and analysis.This cost-efficient and scalable system is ideal for protecting agricultural lands, schools, highways, and residential zones located near forest areas. By integrating AI, ML, and IoT technologies, it effectively reduces false alerts, prevents human–wildlife conflicts, safeguards crops, and promotes sustainable smart farming practices.*

Keywords: Image-Based Detection, Deep Learning, YOLO, CNN, Raspberry Pi, IoT, Smart Farming, Intrusion Detection, Computer Vision, Public Safety

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