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# Wild Animal Deterrent System for Crop Protection: Leveraging TensorFlow IoT-based Acoustic Classification System

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**Abstract:** *The protection of crops from damage by wild animals poses a significant challenge for farmers worldwide. To address this issue while promoting non-violent coexistence with wildlife, this project focuses on the development and implementation of an intelligent wild animals' deterrent system. We employed various deep learning techniques, training several convolutional neural network models, including VGG16, ResNet50, DenseNet121, EfficientNetB0, EfficientNetB1, EfficientNetB2, Xception, InceptionV3, MobileNetV2, NASNetMobile, and NASNetLarge, using transfer learning, fine-tuning and by integrating night vision images into the dataset comprising 13 common wild animal classes known for farmland intrusion. Upon detection of an animal, the system triggers an ultrasonic alarm to repel the specific animal without causing harm. Furthermore, real-time notifications containing images of the detected animal, its type, and timestamp are sent to the farmer's mobile device, enabling prompt action to protect crops.In the pursuit of effective crop protection, this project emphasizes both accuracy and humane deterrence. The utilization of deep learning, specifically NASNetLarge model, ensures robust animal detection capabilities, even in challenging lighting conditions commonly encountered in agricultural environments. The inclusion of night vision images enriches the dataset, enhancing the model's ability to discern animals accurately. The integration of an ultrasonic alarm system offers a non-invasive method of repelling animals, minimizing crop damage without resorting to physical harm. Moreover, the real-time notifications empower farmers with timely information, enabling swift responses to potential threats. Overall, this project represents a comprehensive solution for mitigating crop damage by wild animals while fostering sustainable coexistence between agriculture and wildlife.*

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