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Patent Search

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Abstract:

The edge computing has become an essential technology for real-time application development by moving processing and storage capabilities close to end devices, reducing latency, improving response time and ensuring secure data exchange. In this work, we focus on a Smart Agriculture application that aims to protect crops from attacks, and therefore to significantly reduce production losses, through the creation of virtual fences that take advantage of computer vision and ultrasound emission with an innovative device capable of generating ultrasound to drive away ungulates and thus protect crops from their attack, this work provides a comprehensive design, development and assessment of an intelligent animal repulsion system that allows to detect and recognize the ungulates as well as generate ultrasonic signals tailored to each species of the ungulate. Taking into account the constraints coming from the rural environment in terms of energy supply and network connectivity, the system is based on IoT platforms that provide a satisfactory compromise between performance, cost and energy consumption. More specifically, in this work, we have evaluated various edge computing devices (Raspberry Pi with or without a neural compute stick, and NVIDIA Jetson Nano) running real-time object detector (YOLO or YOLO) with custom-trained models to identify the most suitable animal recognition HW/SW platform to be integrated with the ultrasound generator. Experimental results show the feasibility of the intelligent animal repelling system through the deployment of the animal detectors on power efficient edge computing devices without compromising mean average precision and also satisfying real-time requirements. In addition, for each HW/SW platform, the experimental study provides a cost/performance analysis, measurements of the average and peak CPU temperature. Best practices are also discussed and lastly, this product discusses how the combined technology used can help farmers and agronomists in their decision making and management process.

Complete Specification

Claims,

1. Simplified deployed and evaluated various edge computing devices such as Raspberry Pi, with or without a neural compute stick, and NVIDIA Jetson Nano runni time object detector (YOLO and Tiny-YOLO) with custom-trained models to identify the most suitable.
2. An animal repellent system as defined in claim 1 wherein said The feasibility of the intelligent animal repelling system through the deployment of the animal de power efficient edge computing devices without compromising the mean average precision and also satisfying real-time requirements with thermal image camera.
3. An animal repellent system as defined in claim 1 wherein said the animal repelling device has been integrated with a tiny and powerful edge computing device i DNN software.
4. An animal repellent system as defined in claim 2 wherein said Thermal image camera is used to identify and given the inputs to the night vision and as well as a device to increase the efficiency of the device.
5. An animal repellent system as defined in claim 1 wherein said single device can hold multiple input and feedback devices and with AI-DNN for the protection of i damage from the wild animal

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