ATRIA INSTITUTE OF TECHNOLOGY

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Department of Electronics & Communication Engineering

Title: MACHINE-LEARNING BASED ACOUSTIC REPELLENT SYSTEM FOR PROTECTING CROPS AGAINST WILD ANIMAL ATTACKS

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Project Guide:
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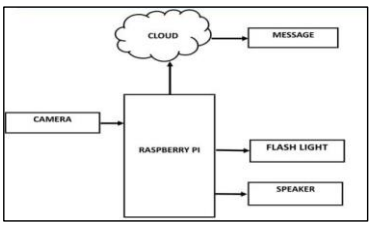
ABSTRACT: The farmers worldwide are gravely concerned about the situation and face significant social and financial hardship as a result. The primary objective is to develop a mechanism that can protect crops from wild animal damage without causing them physical harm. As part of this effort, a new acoustic repellent system has been developed that employs a machine learning model based on a convolutional neural network (CNN) and an infrared camera to identify target animals such as elephants, wild boars, bears, and fox. By combining a camera and frequency generator with a Raspberry Pi (Rpi) module, different animals can be identified and targeted with specific frequencies to prevent their entry into farms.

METHODOLOGY & BLOCK DIGRAM:



Detection of animals

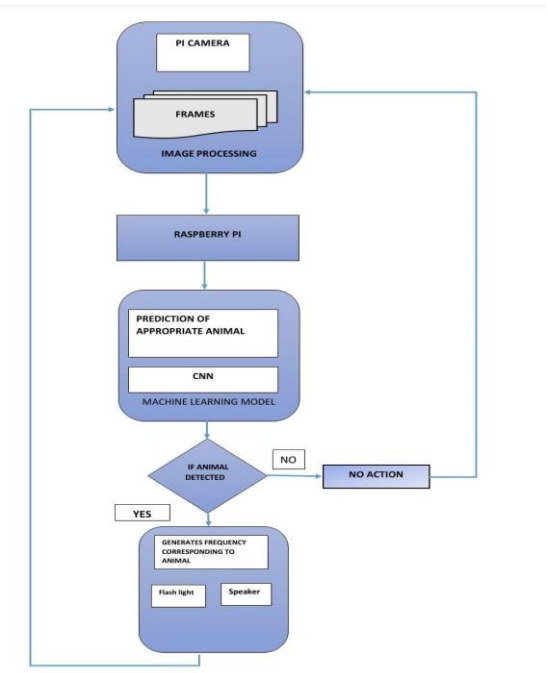
The movement and images of approaching animals would be detected by high resolution Infrared Night Vision camera. The camera will capture the video continuously, and the video will fed directly to Raspberry Pi, a microcontroller that acts as a coordinator and the brain of the entire module.

Machine learning model for animal detection

The prediction will be done using a machine learning model which is based on the convolution neural network framework. The CNN framework is a deep learning algorithm generally used in frame recognition. **Acoustic repelling of detected animal**

Upon prediction of a particular animal, the Rpi will send a command to generate a particular range of frequencies corresponding to the predicted animal.

FLOW CHART:



RESULT AND DISCUSSION: (With Images/Graphs)

A machine-learning based acoustic repellent system shows great potential for reducing crop damage and increasing yield by detecting wild animals and emitting high-frequency sound waves that effectively repel them without harm. Challenges remain, such as system optimization and evaluating effectiveness in different environments and with various animal species.

CONCLUSION & FUTURE SCOPE:

In conclusion, the development of a machine-learning-based acoustic repellent system for protecting crops against wild animal attacks is a promising approach that shows great potential for reducing crop damage and increasing yield. By leveraging machine learning algorithms, the system can detect the presence of wild animals and emit high-frequency sound waves that effectively repel them, without causing harm to the animals.

Future research should focus on addressing these challenges and improving the system's performance, as well as exploring the possibility of integrating other technologies such as sensors and cameras to enhance the system's capabilities. Additionally, the development of cost-effective and userfriendly systems will be critical for ensuring widespread adoption by farmers and increasing the system's impact on protecting crops from wild animal attacks.

OUTCOME ACHIEVED: KSCST/exhibition competition/Paper published/ patent filed.