# PEST DETECTION AND OBLITARATION BASED ROBOTIC SYSTEM

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IoT, Agriculture based project.

**Introduction:**

Pesticides are a major problem for Indian farmers compared to pests. There is always a bit of poison in the food we consume. Pesticides are agents used to destroy pests, which are detrimental to humans or human concerns like agriculture. Almost 30,000crores worthy of crops are destroyed by pests and insects in India every year, which make farmers to use pesticides. Experts believe that chronic low level pesticide exposure is associated with a broad range of nervous system symptoms such as headache, tension, dizziness, depression, anger. Agriculture scientists worldwide are working on biological alternatives to chemical pesticides with increasing consumer pressure on both farmers and supermarkets to minimize the use of chemical pesticides. With the growth of organic market, people are taking much more interest on what farmers use to control pests. Nowadays farmers are encouraged for practicing organic farming. Organic farming produce good quality food but production costs are very higher, needed more workers and One of the major problem in agriculture that limits the yield of crops is pest diseases which caused by pests including rodents.

Farmer in spite of competing with pests for years, the Crop loss caused by pests has been increasing which threaten all around the world. It has been estimated that 70% of crops could be lost due to pests The term ultrasonic or ultrasound refers to the sound with frequencies above 20,000 Hz or audible sound. The Ultrasonic sound generator uses various methods including piezoelectric method, magneto striction method to produce sound waves above 20,000 Hz. The demand for more food is increasing. Smart agriculture through use of IOT technologies will help the farmers to reduce generated wastes and enhance productivity. IOT helps the farmers to capture real time data regarding crops using sensors and to analyze the status of crop to make decisions earlier which increases the quality of production. It enables better monitoring of crops and avoids crop losses due to diseases or adverse weather.

**Objectives:**

1. Download images from the internet for initial analysis.
2. Develop the algorithm for white fly detection.
3. Modify the developed algorithm to make it work for hornets and aphids.
4. Develop the video processing system based on algorithm developed.
5. Develop the robotic system for spraying pesticides.

**Methodology:**

The data from the camera is taken into the video processor. The video processor does the following operations:

1. The algorithm reads the incoming video frames from the camera
2. There are different color components in image/video processing, such as hue, saturation, brightness, RGB, and others. We need to identify in which of these colour models can we clearly distinguish between the pests and the rest of the background present in image/video frame.
3. Calculate the threshold to separate the pests and the background
4. Make all the pests white and rest of the background black, based on the threshold calculated. This technique is called segmentation
5. During segmentation sometimes, a part of the pests may become black, and part of the background may become white. These irregularities are considered to be noisy pixels. Perform noise removal using a technique known as morphological operation.
6. Count the pests identified.
7. Based on the number of pests, send command to the robotic prototype on spraying the pesticide.

On the robotic prototype side, the following operations occur:

1. Receive the count from the video processor.
2. If count > X, then stop the robot, spray pesticide for few seconds, and move the robot forward so that it can scan the next plant.
3. If the count < X, then no need to spray. In such situation, the robot must continue to move forward.

**Results and Conclusion:**

The main objective of the system is, to aware the farmers about the pests and condition of the agricultural field. In the proposed system, for more accuracy image processing technology has been used and acoustic, PIR sensors are interfaced. The proposed system is a best alternative to chemical pesticides and can able to reduce the manual labour of monitoring the agricultural field. Therefore this proposal would help the farmers to increase their crop production by automated pest management at low costs and ensures a healthy food. Our proposed system mainly focuses on three crops.

**Scope for future work:**

The following modifications can be made to present project, which lead to still smarter project.

1. The focus in future is to extend the implementation of system, which will be admissible to diversity of crops with varying heights and pest attacks.
2. The future goal is to provide the farmers an efficient pest control system with affordable cost to get rid of pests and thus increase their crop productivity.