# Parasite Analyser Using Artificial Neural Network

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***Abstract*- Crop destruction causes so much damage to the crops or agricultural products which causes reduction in the productivity. There are numerous important crops are at risk. Parasites are controlled environmentally by unfriendly pesticides. Once a pest has reached either an economic threshold, or intolerable level action should be taken. Pesticides are used as a control measure while other strategies will not bring the parasite population under the threshold. So, here we use early parasite analyser to detect the parasite in a plant and its location. We use artificial network method to analyse the parasite. ANN technique is used to detect the pest in the field. This method is used to resolve the problem of classification, identification, authentication, diagnostics, optimization and approximation.**

**Index terms- Parasites Analyser, ANN (Artificial neural network)**

## INTRODUCTION

Agriculture plays an important role in the life of economic system. Most of the crops get affected by the parasites.

A parasite or pest is an insects or other small animal that harms or destroy crops.

Vertebrate Pests have a backbone. Examples: Rodents, birds, reptiles, and other mammals

1. Invertebrate Pests
   No backbone. Examples: Insets, spiders, ticks, slugs
2. Weeds
   Any plant growing out of place.
3. Diseases
   Fungi, bacteria, viruses, and other microorganisms

To detect the parasite in the crop we use artificial neural network to detect the location and to identify the type of pest. Artificial neural network visualize input image into segments to simplify image analysis. Segments represent objects or separation of objects, and comprise sets of pixels, or "super-pixels". Image segmentation sorts pixels into larger components, eliminating the need to consider individual pixels as units of observation. Artificial neural network is an interconnected nodes similar to the biological neural network. It performs the task generally without programmed with set of rules. In this process input image is divided into small units or pixels and analyse the image. Processing of image involves image pre-processing, data reduction, segmentation, recognition.

## LITERATURE SURVEY

Sriwastwa Et.Al[1]To detect the pest in required image, used colour based technique using k cluster algorithm. In this determining membership function is not easy and every colour spaces present its own issues that can affect the segmentation done by K - clustering algorithm. [Monika wadhai ET.Al [2] used video processing technique in which they convert the video into separate images and detect location of the pest. It is expensive method in terms of time and memory. Carlos Et.Al [3] used threshold based image segmentation, in this technique it is highly dependent on peaks, spatial details which are not considered. This method lack the sensitivity and specification need for classification. JohnnieL. Miranda Et.Al [4] used edge based method to detect the pest. It divides the image into many region and it is long process. Uses background modelling. Jayme Et.Al [5] Discussed about the pests and diseases that leads to losses. It identified whiteflies in different stages of their life cycle on soya bean leaves using digital image processing. Jabert Et.Al [6] has researched on pest control in coffee plantations. Rajan Et.Al [7] Has compared various classification techniques out of which svm provided the best result for detection of pests. They have used k-means clustering and subtracted pests from plant background. Ganesh Bhadane Et.Al [8] acquired images of the infected leaves, after pre-processing applied image

segmentation techniques to detect the infected parts of plants. A software model was stimulated on different leaves for pest detection. Sushma R. Huddar Et.Al [9] proposed an algorithm to divide and detect pests based on relative difference in pixel intensities (RDI). Prasad Babu Et.Al [10] prepared a software prototype for pest infected plants providing remedial methods and solutions for the different pests and disease related issues in various fields.

## EXISTING

Our existing paper is based on detection of pest using colour based image segmentation. The methods used in this are pre-processing and colour based image segmentation. Pre-processing involves conversion of image to grayscale, removal of uneven illumination with top hat filtering methods using structuring elements as disks. Final step of pre-processing involves contrast adjustments. Colour based image segmentation helps in dividing of a digital image into segmentation. Here they convert the image from RCB to L*A*B* colour space and the performs K-Means clustering.L*A*B* refers to as,

L*-Luminosity layer.

A*-Showing colours along read and green axis.

B*-Showing colours along blue and yellow axis.

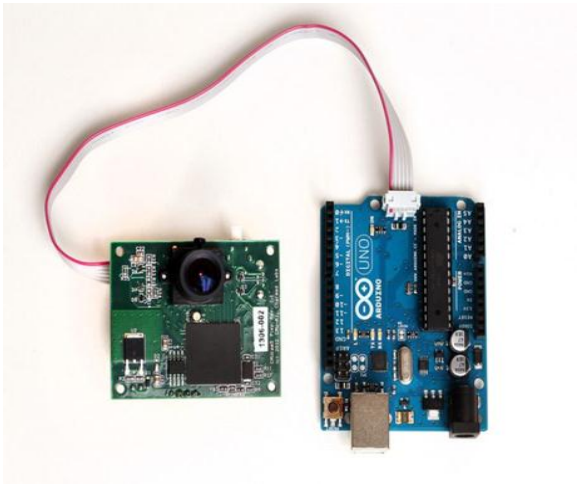
They have carried out their experiment on pyrilla pest in sugarcane. The drawback of their project was manual selection of the cluster which arises as the colour segmentation and use K-means clustering algorithm for clustering. The centroids for clustering are assigned each time in a random fasion. This is all about brief information of our existing project.

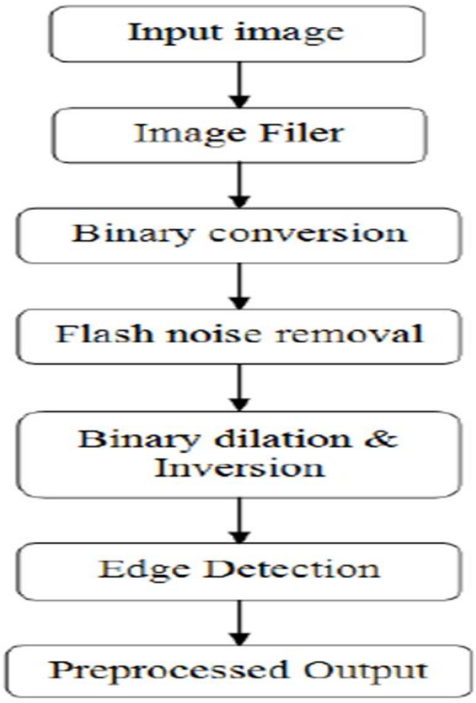
## METHODOLOGY

1] PRE-PROCESSING:

Image pre-processing used to remove uneven frequency and to reduce noise and contrast enhancement. The main objective of image processing is to improve, restore and rebuild the image.

In our project we use image sensor (pixycam5 image sensor) which we connect to the microcontroller (Arduino Uno) to detect and capture the object. Image sensor use colour based technique and process the image and produce the results. We use this image sensor to monitor and capture the images of the crops and to detect the pest in the crops.





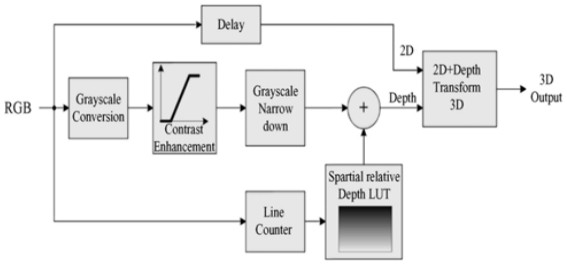

2] IMAGE SEGMENTATION:

Image segmentation is the process of dividing the process of the digital image into several parts. It is used to locate the part affected by the parasite. Image segmentation has three steps

1. Classification
2. Object detection
3. Segmentation

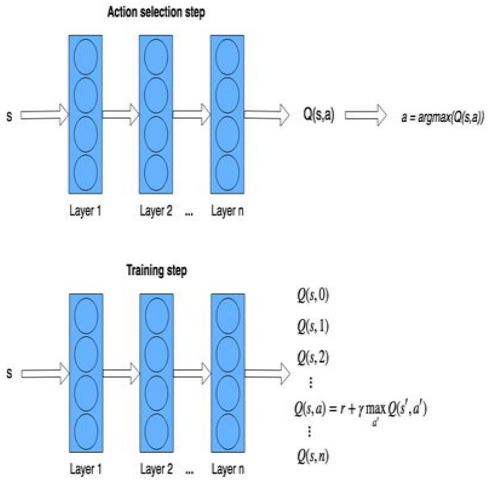
Classification is used categorise and group the images of the plants. Object detection is used by detecting the pest within the image. In object detection we used to find the parasites on the leaf or

the affected region of the leaf. Segmentation is used to identify the parts of the image and classify the parasite and affected area in the image. We use sematic segmentation which is used to classify the image into meaningful classes. In sematic segmentation based on the objects in the image it is segmented and classified.




3] TRAINING IMAGES:

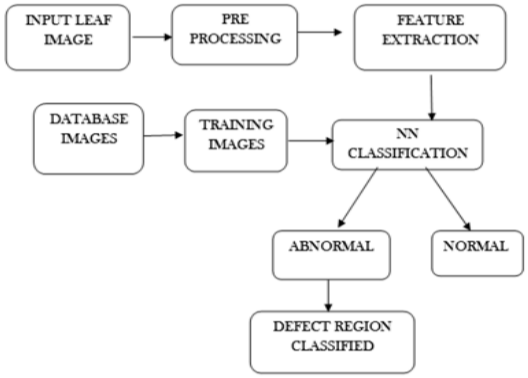
We use machine learning, deep learning methodology to train the machine to analyse and detect the affected area of the leaf. In our project we use tensor flow and python to create a class and train the machine with images of different parasites and to analyse the type of disease affected by the parasite. We use artificial neural network to identify the image and to analyse the affected the area of the leaf. First we created a dataset of different parasites and image of affected region of leaf to analyse the disease. Neural network is similar to neuron in human brain. In neural network we have single layer with many hidden layers which is used to analyse the input image with the dataset and analyse whether the leaf is affected or not. It observe the input image and examine the leaf and the type of disease it got affected. The layers are made of nodes. Node is used to commutate and analysis the input image.




It is used to detect the early stage of the disease and to increase the productivity of the crops.

4] DEFECT REGION DETECTION:

ANN Method is used to detect the affect area region by the parasite and locate the area. It is used to detect the region affected by the parasite. In our project we use neuroevolution to train the neural networks to identify and detect the region affected by the parasite.




## CONCLUSION

Artificial neural network is the fastest application to detect the parasite and to increase the productivity. ANN method technique gives more prominent results when compared to existing colour based image segmentation. It is an effective method to detect the parasite which is used to control the affected area of the pest and to increase the productivity of the crops. ANN is powerful method to recognise the characteristics of the input image. This method can be used in many fields like security, defence, agriculture, medicine and analysis.

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