**A PROJECT BASED LEARNING**

**REPORT ON**

**“SMART AGRICULTURE”**

SUBMITTED TOWARDS THE

PARTIAL FULFILLMENT OF THE REQUIREMENTS OF **BACHELOR OF ENGINEERING (SE AI & DS)**

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“Excellence in the field of AI & DS”

**Department of Artificial Intelligence & Data Science**

“Techno-Social Excellence”

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**Department of Artificial Intelligence & Data Science CERTIFICATE**

This is to certify that the Project Entitled

**“SMART AGRICULTURE”**

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**Abstract**

The project is an Internet of Things-based smart agriculture. The model's primary goal will be to detect pests in crops before they cause any critical damages. In this context, this project aims to develop a pest detection system using IoT techniques. The system will be designed to detect pests in crops through a combination of some sensors and arduino.The farmer can then take appropriate action, such as applying pesticide or removing infected crops.This will have an efficient outcome.

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**SMART AGRICULTURE**

**Introduction:**

* Crop diseases and insect pests, which are characterized by their high diversity, serious impacts, and localized outbreaks, can cause severe agricultural losses.
* Globally, 20%–40% of crop plant yields are lost annually because of the incidence of crop pests and diseases
* Changes in the global climate and farming systems have led to changes in the incidence of agricultural diseases and insect pests.
* Pesticides are commonly used to control diseases and insect pests in agriculture because they are highly and rapidly effective and allow agricultural producers to increase crop yields.

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**Objective:**

-Classification accuracy of different guava plant diseases in real-world scenarios.

-Identify pest and Monitor Progress.

-Cost Effective model.

-Reduce the unnecessary use of pesticides.

­­-Reducing Manpower.

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Literature survey:-

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No | Title of the Paper | Year | Remarks |
| 1 | Artificial Intelligence Technology in the Agricultural Sector: A Systematic Literature Review | 2022 | To Improve the Productivity of Farms and Solve Some Agricultural Problems. |
| 2 | Role of Artificial Intelligence in Agriculture: An Analysis and Advancements With Focus on Plant Diseases | 2023 | In Manual Process, Detection of Plant diseases is almost impossible so by using AI techniques plant diseases can be detected. |
| 3 | A Lightweight Deep Learning  Framework for Crop Pest Detection  and Classification | 2023 | The results indicated that our system could reliably localize and categorize  pests of various types, even in the context of complicated backgrounds and fluctuations in different pest forms, hues,dimensions, positions, and luminance. |
| 4 | An Early and Smart Detection of Corn Plant Leaf Diseases Using IoT and Deep Learning Multi-Models | 2024 | To develop a multi-model network with the fusion of multi-contextual networks that is automatically exploited with the CNN strategies. |

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**Motivation:**

* One of the most significant risks impacting crops is pests, which substantially decrease food production.
* Further, prompt and precise recognition of pests can help harvesters save damage and enhance the quality of crops by enabling them to take appropriate preventive action.
* Advanced technical technologies in agriculture are urgently required to detect pests in their early stages and prevent the widespread application of harmful pesticides

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**Problem Statement:**

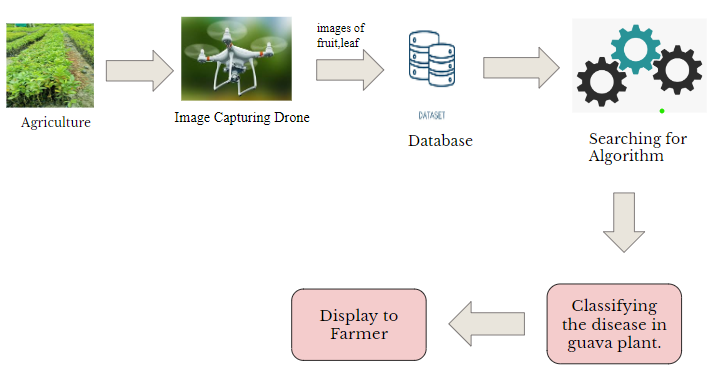
To develop a device that will help in pest detection of guava plant which will increase

its agricultural production.

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**System Architecture:**



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**Algorithm Used:**

* Object Detection
* Semantic Segmentation
* K-means algorithm
* Watershed algorithm
* Image processing algorithm
* Image analysis algorithm

Department of AI & DS, MMIT, Lohgaon, Pune 47  **Page no:7 Hardware Requirement:**

1)Drones

2)Sensors :-

**\*** RGB Sensor

**\*** Soil Sensor

**\*** IR Sensor

**\*** Fluorescence Senso **\*** Motion Sensor

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**Software Requirement:**

1)Computer System :-

Operating System : Ubuntu

Programming Language : Python

RAM : 4 GB (min)

Hard Disk : 50 GB

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**Future Scope:**

Plan to combine several image classification methods of multiple plants with the present system to realize accurate disease identification and integration with the intelligent plant protection devices based on the classification results.

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**Conclusion:**

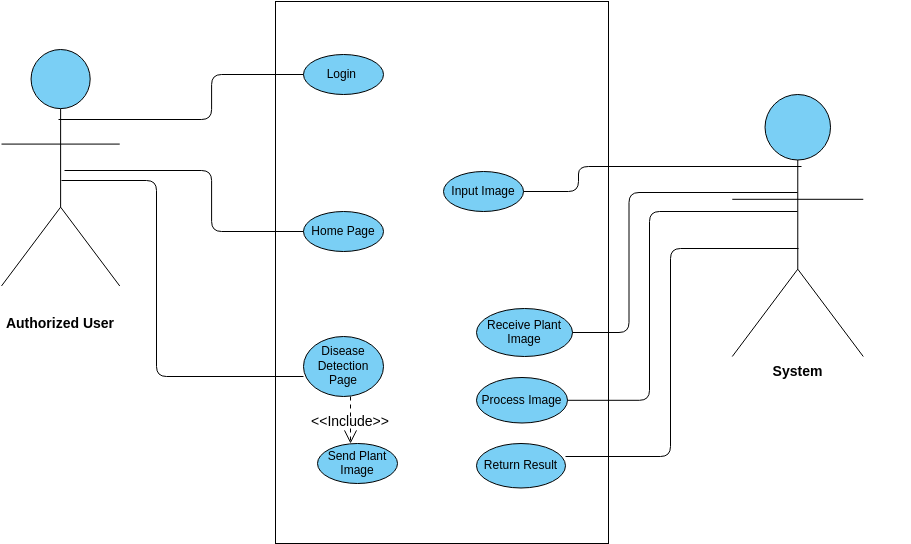
We developed a system for prevention and control of Guava plant diseases.

The system controls diseases and pests effectively with no adverse effects on the normal growth of the crop.

It greatly reduces the amount of chemical pesticides used, which significantly decreases the costs of agrochemicals and labor.

This work provides a reference for development of intelligent equipment for the prevention and control of diseases and insect pests using physical control methods.

**Use case diagram:**

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**References:**

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* FAROOQ ALI 1, HUMA QAYYUM 1, AND MUHAMMAD JAVED IQBAL 2,”Faster-PestNet: A Lightweight Deep Learning Framework for Crop Pest Detection and Classification .”
* RUBINA RASHID 1, WAQAR ASLAM 2, ROMANA AZIZ3, AND GHADAH ALDEHIM3,”An Early and Smart Detection of Corn Plant Leaf Diseases Using IoT and Deep Learning Multi-Models.”

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