



# “WEED DETECTION AND MANAGING WEEDS BY USING MECHANICAL WEEDING AGBOTS”

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**Abstract:** One of the oldest human food sources in the world is agriculture. Weeds are a concern because they crowd out valuable crops and take up space, water, and nutrients. accurate recognition of the undesirable vegetation is necessary for the development of a successful weed removal method. The Arduino Uno, the device that acts as the foundation for the robot's operation, is supplied with software that controls every movement of the robot.. The robot's primary function is to recognise weeds, chop them down using a cutter, and spray pesticides only in areas where weeds are present.

**Keywords:** Agbot, Weed Detection, Pesticide, CNN.

## I. INTRODUCTION

With the demand for agricultural goods rising and the necessity to modernise the plantation system, agricultural development is the main issue in the modern world. Due of this, farmers and academics have worked hard to eradicate harmful weeds for many years. By competing with the plants for water, nutrients, and sunlight, weeds prevent crops from growing, which has a corrosive effect on agricultural yield. Pesticides and other agrochemicals are therefore often employed in agricultural farms to eradicate weeds, but they may have some serious adverse health impacts on living things. Decreased usage of pesticides for managing undesirable weeds in fields is thus one of the major obstacles to achieving the objective of sustainable development. Human labour is used inefficiently and extensively in traditional agricultural models. When mechanisation and automation occur.

Today's automated tilling machines are mostly classified as planting and irrigation equipment. Weeding, fertiliser application, and watering are frequently included in plant nurseries. Numerous research are now devoted to the development and testing of intelligent weeding devices.

The method of using pesticides to get rid of weeds is a bit risky since we consume the crops that have been exposed to the pesticides, which might lead to health problems for us. So, without any problems, we must permanently eliminate them. We must use a cutter to remove the weeds in order to fulfil this necessity. With this robot, the weed elimination operation just requires a single investment..

The Agriculture Department has kept track on the health of the plants and crops at various levels. As study into the harms done to different crops based on their types is done, several crops and their details have been investigated. To give a good picture of the overall quality of crops, several image processing algorithms are used for the vision system, which is used in agriculture and is unaffected by humans.

By utilising the data offered by machine learning algorithms, image processing, and neural networks, this system provides a clear picture and assists in helping to make appropriate decisions (classifiers). The system generates a report on weed identification findings by detecting picture data that is provided by image processing methods. The system provides real-time crop and weed identification. The process has two stages: The first stage uses a set of training data, and the second stage processes test data while altering the input image's size and obtaining colour and texture attributes like energy, contrast, homogeneity, and correlation. The classifier will then automatically classify the test photos to determine the features of the weed. For such methods

An key limiting element impacting agricultural productivity and profitability is weed competition. Robotic weeding systems have proven they can reduce the need for herbicides, cut expenses, and lessen the negative effects of weeds on agricultural environments. The design of robots is based on an analysis of the working conditions in agricultural environments. Crop cutters made with our software and hardware provide speedy, ideal results.



Agribot is a self-contained robot that aids farmers in the creation of software that recognises weed diseases, removes them, and sprays pesticides on the damaged plant. To identify weed illness, one uses the CNN classifier. Unuseful weed is a plant that aggressively reproduces outside of its natural environment. Weed is a term used to describe species outside of the plant kingdom that exist in a variety of habitats, reproduce quickly, and compete with preferred plants for resources.

## II. LITERATURE REVIEW

### A. Image Processing Techniques for Plant Leaf Disease Identification

The creation of an agriculture robot with weed identification capabilities is proposed in this research. By taking into account a number of important factors, the hardware that consists of both mechanical and electronic systems was proposed. Using a variety of filtering and sensor fusion techniques, data from several sensor plugins was collected and processed to get crucial data, such as the distance and angle to the goal, which is used for the robot's autonomous navigation. On the robot that was used to get there, linear and rotational motion were controlled simultaneously. Additionally, a modified deep-learning model for weed detection is presented.

proposed. This robot's main goal is the automatic, real-time detection of marijuana without human intervention.

### B. Image-based weed detection and elimination

The weed control method described in this study distinguishes weeds from crops and prevents weed growth solely through targeted weed removal. To do this, the field is periodically photographed, processed on a Raspberry Pi board, and an image processing algorithm is applied to separate the desired plants from the weeds. This is based on numerous characteristics like the crop's and weed's size and colour. After image processing accurately locates and identifies the weeds, the Raspberry Pi board sends a signal to the weed cutting system to activate it. The selective activation of the weed removal system enables the precise eradication of weeds.

### C. Smart Automated Pesticide Spraying Bot.

This study describes a robot that can spray pesticides on its own and with less damage to the environment. Under wireless sensor network, the project is located. wireless sensor networks' use to environmental, biomedical, and agricultural monitoring applications, etc. This bot will greatly benefit the farmers. Using cell phones, this bot will spray insecticides across the entire crop. This bot is simple to control. All of the farm's plants are covered in insecticides by the robot. This will be used in application forms for disease prevention and pest control. The farmer's time and workload will be decreased by using this bot.

### D. Weed Detection using Image Processing

This article outlines a technique for weed detection using image processing. Using our system, we are able to detect and separate separate the crop plants from the weed-affected region. The goal of creating such a system is to identify weed-infested regions and utilise those locations for new seeding.

To boost productivity, it is possible to consider doing more weed control activities in this region. Using the photographs' shape, colour, texture, and size, weeds can be identified. features using an image processing method. Previous studies have shown the great accuracy when taking into account many additional factors like texture, DNA, etc. Finding weeds early on is crucial for their control and elimination. To protect the agricultural plants, a suitable weed identification algorithm must be utilised. The suggested approach takes into account basic edge detection algorithms.

## III. CONCLUSION

We will create a way to detect marijuana using image processing and a convolution neural network with the aid of this system. Our method allows us to identify and distinguish weed-affected areas from crop plants so that additional weed control measures can be done.

This study's first findings suggest that most autonomous systems are more flexible than conventional systems. Significant improvements were made to the advantages of lower labour expenses and fewer daily working hours. Thus, it has enabled automation of the most important working processes. However, several have failed as a result of the accuracy requirements of particular activities. Additionally, at this point in time.

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