



## Robotics in Agriculture

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An agricultural robot is a robot deployed for agricultural purposes. The main area of application of robots in agriculture today is at the harvesting stage. Emerging applications of robots or drones in agriculture include weed control, cloud seeding, planting seeds, harvesting, environmental monitoring and soil analysis. A key goal of contemporary agriculture is to dramatically increase the production of food, feed, fiber, and biofuel products in a sustainable fashion, facing the pressure of diminishing farm labor supply. Agricultural robots can accelerate plant breeding and advance data-driven precision farming with significantly reduced labor inputs by providing task-appropriate sensing and actuation at fine spatiotemporal resolutions. Various autonomous remotely controlled prototypes have been developed for orchards and horticultural crops such as oranges, strawberries and tomatoes.

### Introduction

Agricultural robots are specialized articles of technology that are capable of assisting farmers with a wide range of operations. They have the capability to analyze, contemplate, and carry out a multitude of functions, and they can be programmed to grow and evolve to match the needs of various tasks. Agricultural Robots can be used for an incredible number of tasks to ease the burden on the farmers. Their primary role is to tackle labor-intensive, repetitive, and physically demanding tasks.

### Robotics

Robotics and Autonomous Systems (RAS) are set to transform global industries. These technologies will have greatest impact on large sectors of the economy with relatively Low productivity. The robotics plays a major role in various fields such as industrial, medical, military Applications etc. The robotics field are gradually increasing its productivity in the agriculture field. Some of the major problems in Indian agriculture are rising of input costs, Availability of skilled labor, lack of water resources and crop monitoring.

**Robotic Technology in Agriculture:** A robot is an automatic device that performs functions normally ascribed to humans or simply a machine in the form of a human. It is a machine that senses the environment and processes and responds to the sensor's information with a computer command. Agricultural Robotics is the logical proliferation of automation technology into bio-systems such as Agriculture, forestry, green house, and horticulture.

### Applications of Robotics in Agriculture

Data scouting at different stage of crop growth: Yield in a given field may vary in space depending on a combination of factors such as nutrient availability, soil moisture, rooting depth, pest pressure, weed density, crop maturity and others. Good agricultural practice needs an application of optimum input at appropriate time series. Continue monitoring and data collecting related to crop NDVI, Biomass, Leaf area index, crop growth rate, water stress are

an important parameter for Optimizing the variable input parameters in different stages of crop growth and also crop Health. Crop physical status monitoring would be less expensive and timelier Intercultural operation: Weed competes with the crop for sunlight, space, and nutrients. To control weed Species, a large number of herbicides and chemicals are used in agricultural fields, which results in drinking water contaminated and environmental pollution. Removing of weeds from the row is easy as compared to removing weeds from intra-row which required high- Speed sensing device and high- speed Mechanisms to push rotary blades or chemical spray for intra row application. Harvesting Bulk harvesting is the common trend of harvesting in India. This process of Harvesting suitable for few selective crops, so fearsome crops like cotton where the maturity of cotton ball achieves at the different time period in a single plant Selective harvesting needs sensing technology for collecting information of crop which needs to be processed through microprocessor or microcontroller and finally define the status according to which decision support system supply command to the mechanical mechanism to harvest of defined crops. Conclusion Innovation in terms of robotics applications in agriculture has advanced considerably in the last 5 years. The objective of agricultural robotics is to help the sector in its efficiency and in the profitability of the processes. In other words, mobile robotics works in the agricultural sector to improve productivity, specialization and environmental sustainability. Labour shortages, increased consumer demand and high production costs are some of the factors that have accelerated automation in this sector, with the aim of reducing costs and optimizing harvests.

## References

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