## Automation and Robotics in Agriculture: The Emergence of Smart Farms

Wisdom Leaf Press Pages number, 117–122 © The Authors 2024 https://journals.icapsr.com/index.php/wlp DOI: 10.55938/wlp.v1i2.121



## Atreyi Pramanik<sup>1</sup>, Rahul Mahala<sup>2</sup> and Shailendra Thapliyal<sup>3</sup>

## Abstract

The article discusses Agriculture 4.0, a concept of intelligent farming, as well as important technology and applications. It emphasizes how crucial modern infrastructures, cloud computing, and automated machinery are to streamlining daily operations and figuring out input material requirements. This review paper explores the use of agricultural robotic systems in tasks like land preparation, sowing, planting, treatment, harvesting, yield estimation, and phenotyping. The challenges that ground robots encounter in agricultural environments are discussed, including the wide range of environmental factors, complex plant canopy systems, and biological differences between species. It examines at both possible future paths and current approaches. Additionally, it examines the most recent developments in precision agriculture's utilization of mobile robots, with an emphasis on technologies for soil, crop, and field monitoring. It includes case analysis and illustrates important robotic solutions, especially land-based robots. The analysis emphasizes how other agricultural operations are increasingly being automated, with a rising concentration on vision and cloud point identification. The integration of cloud computing with precision agriculture and intelligent farming techniques is covered in this study, along with how agriculture robots and automation systems can overcome computation, retention, and storage constraints.

## Keywords

Intelligent Farming, Autonomous Robots, Agricultural Robotics, Robotic Harvesters, Autonomous Weed Control

**Corresponding Author:** 

E-mail id: shailendra@uumail.in

© 2024 by Atreyi Pramanik, Rahul Mahala and Shailendra Thapliyal Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license,(http://creativecommons. org/licenses/by/4.0/). This work is licensed under a Creative Commons Attribution 4.0 International License

<sup>&</sup>lt;sup>1</sup>School of Applied and Life Science, Uttaranchal University, Dehradun, India, atreyipram91@gmail.com <sup>2</sup>Law College Dehradun, Uttaranchal University, Dehradun, Uttarakhand, India, rahulmahala98@gmail.com <sup>3</sup>Uttaranchal Institute of Management, Uttaranchal University, Dehradun, India