

Agricultural robot pdf


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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. This book aims at presenting the fundamental principles of various aspects of automation and robotics as they relate to production agriculture (the branch of agriculture dealing with the raising of crops and animals for food, fiber, and other products). Features of agricultural robots Compared with industrial robots, agricultural robots have the following features: A. Complexity and hard predictability of the operating environment; B. Large-scale and long-term operation; C. High degree of autonomy; D. High degree of adaptability; E. High degree of flexibility; F. High degree of intelligence; G. High degree of safety; H. High degree of reliability; I. High degree of efficiency; J. High degree of accuracy; K. High degree of precision; L. High degree of speed; M. High degree of cost-effectiveness; N. High degree of environmental friendliness; O. High degree of sustainability; P. High degree of scalability; Q. High degree of modularity; R. High degree of interoperability; S. High degree of compatibility; T. High degree of compatibility with existing infrastructure; U. High degree of compatibility with existing standards; V. High degree of compatibility with existing regulations; W. High degree of compatibility with existing practices; X. High degree of compatibility with existing knowledge; Y. High degree of compatibility with existing resources; Z. High degree of compatibility with existing capabilities. In this work, we have designed and implemented a robot which is capable of performing several farming operations such as Seed sowing, ploughing, irrigation, fertilizer application, weeding, and selective harvesting. 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. The development of field robots that can assist workers by carrying payloads and conduct agricultural operations such as crop and animal sensing, weeding and drilling; integration of autonomous systems technologies into existing farm operational equipment such as tractors; robotic systems to harvest crops and conduct complex dextrous operations; In precision agriculture, automation and robotics have become one of the main frameworks which focusing on minimizing environmental impact and simultaneously maximizing agricultural produce. Agricultural robots and intelligent agricultural machines in several agricultural application scenarios for scene and object perception, intelligent navigation support methods, and operational mechanisms and their control. 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.

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