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Enhancing Agricultural Harvesting Efficiency Using AI and IoT

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Abstract

This paper analyses how artificial intelligence (AI) and the Internet of Things (IoT) can be integrated to increase the efficiency of agricultural harvesting operations. There are growing pressures on agriculture to be productive and sustainable today, particularly with respect to climate change and population increase. Artificial intelligence and the Internet of Things have demonstrated early success in revolutionising conventional agriculture by providing data-driven and autonomous solutions. IoT sensors allow real-time monitoring of soil conditions, crop health and environmental factors, while AI processes this data and allows us to predict things and make decisions automatically. The reviewed literature highlights such applications as smart irrigation systems, precision harvesting and UAV-based crop monitoring, which all help to increase yields, lower labour costs and manage resources better. Nonetheless, there are still some problems to be addressed, such as high implementation costs, insufficient digital infrastructure and a lack of technical training of farmers, primarily in developing or rural regions. The paper suggests that although AI and IoT can greatly enhance harvesting efficiency, viable adoption may require solutions that are scalable, affordable and locally configurable. The digital divide in agriculture should also be addressed in future research, in terms of providing small and medium-sized farms with these technologies.

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