

Development of a Multipurpose Agriculture Robot for Sustainable Farming Practices

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Abstract: *The rapid advancement of agricultural automation has led to the development of intelligent systems for enhancing productivity and sustainability. This project focuses on designing a Multipurpose Agriculture Robot capable of performing efficient seeding and pesticide spraying while operating autonomously. The robot integrates energy management, ESP 32 microcontroller-based control, and motorized mechanisms for executing precise agricultural tasks. With an autonomous navigation system, it can efficiently traverse fields, adjusting its path as needed. The integration of a motor driver, relay, and multiple DC motors ensures seamless execution of tasks such as crop monitoring, irrigation, and pest control, minimizing human intervention.*

By leveraging renewable energy sources and smart automation, this system enhances operational efficiency and environmental sustainability in farming. The robot's versatile design allows integration with various mechanical implements, making it adaptable for different stages of crop cultivation. Efficient energy management using battery storage ensures continuous operation, even in low-light conditions. This innovation aims to reduce labor costs, optimize resource utilization, and promote eco-friendly farming practices, making it a valuable asset for modern, sustainable agriculture.

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