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Automatic robotic system design and development for vertical hydroponic farming using IoT and big data analysis

Anurag Shrivastava ^a , Chinmaya Kumar Nayak ^b, R. Dilip ^c, Soumya Ranjan Samal ^d, Sandeep Rout ^e, Shaikh Mohd Ashfaque ^f^a ECE, Lakshmi Narain College of Technology and Science, Indore, India^b Faculty of Emerging Technology, Sri Sri University, Odisha, India^c Dept. of Mechatronics Eng., Acharya Institute of Technology, India^d Faculty of Telecommunications, Technical University of Sofia, Sofia, Bulgaria^e Faculty of Agriculture, Sri Sri University Cuttack, India^f Department of Computer Engineering, Rizvi College of Engineering, India

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Abstract

In this digital world, all the developing countries' growth has improved drastically with farmers' influence and innovative farming processes. Generally, the farming process includes ancient traditional methodologies for maintaining the crops' quality and yields. Their farming was developed and has given more profit only with the quality of the soil and the nutrition used on land. But the drawback is they were spending much time to get their yields from their land, and the nutrition level was not maintained at all times. Moreover, more space was used for farming, with huge manpower required to maintain the entire land. Most countries are moved to smart farming concepts with IoT platforms to optimize the time and techniques. In that hydroponic, the best innovative idea to produce more crops, vegetables, and fruits without soil. Rockwool is used for farming processes with water contaminants at regular intervals will provide huge productions as well as no need to wait for a long time for cultivation. This method was implemented in most of the countries that were doing smart farming with less manpower and low cost. The hydroponic farming methodology is implemented with IoT sensors for monitoring crop's status and health continuously. Once their nutrition level or water level has decreased, it will provide all at constant time intervals to the entire system effectively. A few years ago, hydroponic farming was horizontally implemented on smaller spaces for the regular water flow. But now a day it is implemented on a vertical surface to reduce the space, and water flow is only at the time of need. This technology is used to increase the productivity of the crops with a small space of land and less manpower. Perhaps the cost of the entire system has been taken into consideration by small-scale unit farmers; vertical hydro farming provides better results when compared with previous classical methods. This research paper has given the design and implementation of automated vertical hydro farming techniques with IoT platforms, and their analytics will be done using big data analytics.

Keywords

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Hydroponics; Nutrient solution; Rockwool; Submarine motor; Plant growth light

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