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SMART AGRICUTURE WITH IoT

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Agriculture plays a vital role in the development of the agricultural country. In India, about 70% of the population depends upon farming and one-third of the nation's capital comes from farming. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. Hence the project aims at making agriculture smart using automation and IoT technologies. The highlighting features of this project include a smart GPS based remote-controlled robot to perform tasks like weeding, spraying, moisture sensing, bird and animal scaring, keeping vigilance, etc. Secondly, it includes smart irrigation with smart control and intelligent decision making based on accurate real-time field data. Thirdly, smart warehouse management which includes temperature maintenance, humidity maintenance and theft detection in the warehouse. Controlling of all these operations will be through any remote smart device or computer connected to the Internet and the operations will be performed by interfacing sensors, Wi-Fi or ZigBee modules, camera and actuators with micro-controller and raspberry pi

Keywords: IoT, automation, Wi-Fi

Objective

Agriculture is considered as the basis of life for the human species as it is the main source of food grains. But wherever automation had been implemented and human beings had been replaced by automatic types of machinery, the yield has been improved. The main objective is to making agriculture smart using automation and IoT technologies. The highlighting features of this paper include smart GPS based remote-controlled robots to perform tasks like; weeding, spraying, moisture sensing, bird and animal scaring, keeping vigilance, etc.

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Secondly, smart warehouse management includes; temperature maintenance, humidity maintenance and theft detection in the warehouse.

MATERIALS AND METHOD

As the experimental setup for node1 consists of a mobile robot with a central server, GPS module, camera and other sensors. All sensors are successfully interfaced with the microcontroller and the microcontroller is interfaced with the raspberry pi.GPS and camera are also connected to a raspberry pi. Test results show that the robot can be controlled remotely using wireless transmission of PC commands to R-Pi. R-Pi forwards the commands to the microcontroller and the microcontroller gives signals to the motor driver to drive the Robot.GPS module provides the coordinates for the location of the robot.

The sensors give input to the controller and according to that microcontroller controls the devices in auto mode and also sends the value of sensors to R-Pi and R-Pi forwards it to the user's smart device using the internet. Test results show that when temperature level increases above preset threshold level then cooling fan is started automatically in auto mode. The water pump also gets turned ON if the moisture level goes below a fixed threshold value. In manual mode, the microcontroller receives the controlling signals from R-Pi through ZigBee and accordingly takes the control action.

RESULTS AND DISCUSSION

· A remote sensing and control irrigation system using distributed wireless sensor network aiming for variable rate irrigation, real-time in-field sensing, controlling of a site-specific precision linear move irrigation system to maximize the productivity with minimal use of water

· With the use of GIS, GPS & Remote sensing make our work easier.

· Helps in the generation of employees.

· More yield in less time.

· We can take care of each plant individually.

· Application of material at the right time, right place& right method.

· The technological development in Wireless Sensor Networks made it possible to use in monitoring and control of greenhouse parameters in precision agriculture.

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CONCLUSION

The sensors and microcontrollers of all three Nodes are successfully interfaced with the raspberry pi and wireless communication is achieved between various Nodes.

All observations and experimental tests prove that the project is a complete solution to field activities, irrigation problems, and storage problems using a remote-controlled robot, smart irrigation system and a smart warehouse management system respectively. Implementation of such a system in the field can help to improve the yield of the crops and overall production.

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