IoT in Agriculture

Research Paper Summary

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0.1 Summary

IoT smart agriculture products are designed to help monitor crop fields using sensors and by automating irrigation systems. As a result, farmers and associated brands can easily monitor the field conditions from anywhere without any hassle.

IoT in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and providing data to farmers for rational farm management plans to save both time and money.

Robotics in agriculture

Since the industrial revolution in the 1800s, automation got more advanced to efficiently handle sophisticated tasks and increase production. With increasing demands and shortage of labor across the globe, agriculture robots or commonly known as Agribots are starting to gain attention among farmers. Crop production decreased by an estimated 213 crores approx (3.1 billion) a year due to labor shortages in the USA alone. Recent advancements in sensors and AI technology that lets machines train on their surroundings have made agrobots more notable. We are still in the early stages of an ag-robotics revolution, harnessing the full potential of the Internet of Things in agriculture, with most of the products still in early trial phases and RD mode

1. These smart Agri robots use digital image processing to look through the images of weeds in their database to detect similarities with crops and weed out or spray them directly with their robotic arms. With an increasing number of plants becoming resistant to pesticides they are a boon to the environment and also to farmers who used to spread the pesticides throughout the farm.
2. As remote-controlled toy cars are enabled with a controller, tractors and heavy plowing equipment can be run automatically from the comfort of home through GPS. These integrated automatic machines are highly accurate and self-adjust when they detect differences in terrains, simplifying labor-intensive tasks.
3. Utilizing agribots to pick crops is solving the problem of labor shortages. Working the delicate process of picking fruits and vegetables these innovative machines can operate 24/7. A combination of image processing and robotic arms is used by these machines to determine the fruits to pick hence controlling the quality. .
4. Robots can perform dreaded manual labor tasks working alongside the labors. They can lift heavy materials and perform tasks like plant spacing with high accuracy, therefore optimizing the space and plant quality and reducing production costs.

My views about this paper

The paper has given us an insight as to how agriculture through precision farming implements IoT through the use of robots, drones, sensors, and computer imaging integrated with analytical tools for getting insights and monitoring the farms. Placement of physical equipment on farms monitors and records data, which is then used to get valuable insights.

This had enabled us to get a broader view on how IoT allows devices across a farm to measure all kinds of data remotely and provide this information to the farmer in real time. IoT devices can gather information like soil moisture, chemical application, dam levels and livestock health – as well as monitor fences, vehicles and weather.

Agreement, Pitfalls and Fallacies

The agreement would likely outline the specific tasks and responsibilities of the parties involved in the project, as well as any intellectual property rights or confidentiality agreements.

By adopting IoT in the agricultural sector we get numerous benefits, but still, there are challenges faced by IoT in agricultural sectors. The biggest challenges faced by IoT in the agricultural sector are lack of information, high adoption costs, and security concerns, etc. Most of the farmers are not aware of the implementation of IoT in agriculture. Major problem is that some of them are opposed to new ideas and they do not want to adopt even if it provides numerous benefits. The best thing that can be done to raise awareness of IoT's impact is to demonstrate farmers the use of IoT devices like drones, sensors and other technologies and they could provide them ease at work and accompanied by real-world examples.High Cost: Equipment needed to implement IoT in agriculture is expensive. However sensors are the least expensive component, yet outfitting all of the farmers' fields to be with them would cost more than a thousand dollars. Automated machinery cost more than manually operated machinery as they include cost for farm management software and cloud access to record data. To earn higher profits, it is significant for farmers to invest in these technologies however it would be difficult for them to make the initial investment to set up IoT technology at their farms.

3. Lack of Security: Since IoT devices interact with older equipment they have access to the internet connection, there is no guarantee that they would be able to access drone mapping data or sensor readouts by taking benefit of public connection. An enormous amount of data is collected by IoT agricultural systems which is difficult to protect. Someone can have unauthorized access IoT providers database and could steal and manipulate the data.