



Automation Facilities for Agricultural Machinery Control

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Abstract

The possibility of use of the automation equipment for agricultural machinery control is investigated. The authors proposed solutions on creation of the centralized unified automated information system for mobile aggregates management. In accordance with the modern requirements this system should be open, integrated into the general schema of agricultural enterprise control. Standard hardware, software and communicative features should be realized in tasks of monitoring and control. Therefore the schema should be get with use the unified modules and Russian standards. The complex multivariate unified automated control system for different objects of agricultural purpose based on block and modular creation should correspond to the following principles high reliability, simplicity of service, low expenses in case of operation, the short payback period connected to increase in productivity, the reduced losses when harvesting, postharvest processing and storage, the improved energetic indices Technological processes control in agricultural production is exercised generally with feedback.

Key words: centralized unified automation, Monitoring, Unified modules, Communicative features.

Introduction

Farm automation, often ass Industry with “smart farming”, is technology that makes farms more efficient and automates the crop or livestock production cycle. An increasing number of companies are working on robotics innovation to develop drones, autonomous tractors, robotic harvesters, automatic watering, and seeding robots. Although these technologies are fairly new, the industry has seen an increasing number of traditional agriculture companies adopt farm automation into their processes.

How Automation is Transforming the Farming Industry

The development of agriculture was a watershed moment in humanity. Humans ability to engineer the environment to generate enough food to sustain massive population growth was the first profound change in the relationship between fully-modern humans and the environment. The advent of agriculture kickstarted a wider range of advancements from the use of fire and prepared food to self-driving machinery With a global population projection of 9.7 billion people by 2050, agricultural production will need to increase by at least 70% from current levels to serve nutritional trends. Agriculture has moved us forward us so far in 12,000 years, but we are now at a turning point. And with a global population projection of 9.7 billion people by 2050, agricultural production will need to increase by at least 70% from current levels to serve nutritional trends. Now more than ever, the pressure on farmers to produce nutritious products is putting our planet's health under even more stress. New advancements in technologies ranging from robotics and drones to computer vision software

have completely transformed modern agriculture. Farmers now have access to tools that will help them meet the demands of our world's ever-increasing population.

What technologies are being used in farm automation?

1) Harvest Automation:- Harvesting fruits and vegetables have always proven to be a difficult problem to automate. Harvest robots must be gentle with the produce to avoid bruising and damage. Agrobot has successfully developed the first robot for gently harvesting strawberries, no matter where and how they are grown. From a flexible mobile platform, up to 24 robotics manipulators work together to pick the fruit which meets the farmer's quality standard.

2) Autonomous Tractors:- Autonomous tractors can be controlled remotely or even pre-programmed to give full autonomy to a producer. Rabbit Tractor's autonomous tractor delivers value to row crop farmers not just through a reduction in labor costs, but through increased efficiency across operations and increased yield. Tractor automation kits are even being developed by Bear Flag Robotics that makes automation more accessible for farmers by affordably retrofitting existing tractors with cutting edge driverless technology and implement control.

3) Drones:- Drones can be used to monitor conditions remotely and even apply fertilizers, pesticides, and other treatments from above. They can also quickly and cost effectively identify problem areas with imagery and infrared analysis to help farmers diagnose issues early on. American Robotics is developing a fully autonomous "Robot-as-a-service" with an autonomous drone, base station, and analytics platform that provides insights to growers at resolutions, frequencies, and speeds never before possible.



Advantage of Automation Technology

1. Automation nower operating costs.
2. Improved worker safety.
3. Reduced factory lead times.

Limitations of Automation Technology

- 1) Simple vs Complex Task handling.
- 2) Test code & Backend Issues.
- 3) Limitation by Object Identifiers.
- 4) Updation in Agile environment.
- 5) Automation is Expensive.

Conclusion

With the introduction of automation, agriculture becomes increasingly user- friendly with farmers spending less time in the field and more time at computers analyzing data and diagnosing problems. So far completely automatic farms are still a coveted dream but rapid development and sophistication of agricultural machines pave way for the advent of automatic farming as a mainstream trend of the modern economy.

References

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