Artificial Intelligence- A New Era in Agriculture

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ABSTRACT
Automation of agriculture is the main concern and new challenge for all countries. The world population is growing at a very fast pace and with an increasing population the need for food is increasing briskly. Traditional methods used by farmers are not sufficient to meet the growing demand and therefore they should hinder the ground using harmful pesticides of enhanced manner. There are areas that are causing problems of agriculture as crop diseases, management, control of pests, weed management, lack of irrigation and management water and all these problems can be solved by various techniques mentioned above. Today, it is urgent to decipher the issues like the use of harmful pesticides, controlled irrigation, control of pollution and environmental effects of agricultural practices. The automation of agricultural practices has proven to increase the gain of the ground and also enhanced soil fertility. It also investigates the AI-powered ideas for the future and its challenges in the future.

INTRODUCTION
The world population is expected to be nearly 10 billion by 2050, strengthen the order in a situation of agriculture humble financial development by somewhere in the range of 50% in contrast to 2013 (FAO, 2017). For countries like India, the agricultural sector accounts for 18% of GDP and provides employment to 50% of the country's work force. The development in the agricultural sector will stimulate rural development, which leads to more rural transformation and eventually lead to structural transformation (Mogili and Deepak, 2018). AI is an emerging technology in the field of agriculture. facilities-based AI and machine took today's agricultural system to a different level. This technology has improved agricultural production and improving real-time monitoring, harvesting, processing, and marketing. Latest technology of automated systems using agricultural robots
and drones have made a considerable contribution in the agro-based industry. Other hi-tech computerized systems are designed to determine several important parameters such as the detection of weeds, the performance detection and quality of crops and many other techniques (Liakos et al., 2018). This document includes the technologies used for automated irrigation, weeding, and spraying to improve productivity and reduce the workload on farmers.

The impact of AI on agriculture

Technologies that are using AI to improve efficiency in all areas and also manage the challenges faced by the various sectors, including the various areas of agriculture such as crop yields, irrigation, detection of the content of the soil, followed crop, weeding, harvesting facility (Kim et al., 2008). AI technology-based solutions has enabled farmers to produce more with less input and even improve the quality of production, ensuring market faster go-to for divested cultures. New technologies have contributed to the best of cultures and even helped improve the selection of choice of hybrid seeds that are best suited to the needs of farmers. He implemented by understanding how seeds react to different weather conditions, different soil types. By collecting this information, the chances of plant diseases are reduced. Now bearing able to respond to market trends, the annual results, the needs of consumers, farmers are therefore effectively able to maximize crop yields.

1. Irrigation

The agricultural sector consumes 85% of available freshwater resources around the world. And this percentage is rapidly increasing with population growth and the increase in demand for food. This leaves us with the need with more efficient technologies to come to the proper use of water resources to ensure the irrigation. Manual watering based on soil water measurement was replaced by automatic irrigation scheduling techniques. The plant evapotranspiration, which at various atmospheric parameters such as humidity, wind speed, solar radiation and also the harvest depended on factors such as the stage of growth, plant density, soil properties and pest was considered while autonomous implementation irrigation machines. The technology of intelligent irrigation developed to production without the participation of many people to increase power by detecting the level of the water, the temperature of the soil nutrient content and the weather forecast. The operation is carried out by the microcontroller by turning on / off the irrigator pump.

2. Image-based insight generation

Precision Farming is one of the most discussed areas in today's agriculture. Drone-based images can help in detailed field analysis, crop monitoring, scanning fields and so on. Computer vision technology, the Internet of things and drone data can be combined to ensure by farmers swift action. Feeds of drone image data can be real-time alerts generated precision farming companies like Aerial tronics has to accelerate implemented in commercial drones for image analysis in real time. As some areas where computer vision technology can be used are below

Detecting diseases

Pre-processing of image ensure the sheet images are segmented into areas such as background, not diseased part and diseased part. The diseased part is then cut and sends to remote laboratories for further diagnosis. It also helps in pest detection, nutrient deficiency detection and much more.

Crop harvest identification

Pictures of different crops under white / UV-A light, captured to determine how mature are the green fruit. Farmers can create different levels of readiness based on the crop / fruit category and paste it into separate stacks before sending to market.
Field Management

With high-definition images of airborne systems (drone or helicopter) can be made during the cultivation period in real time estimates, by creating a field map and identify areas where crops need water, fertilizer, or pesticides. This helps in optimizing resources to a large extent.

3. Monitoring of crops

Remote sensing along with hyperspectral imaging and 3D laser scanning to build metrics harvest thousands of acres essential. It has the potential to bring in a revolutionary change, as fields are monitored by farmers both time and effort perspective regarding it. This technology will also be used along the entire life cycle, including preparation of reports in the case of anomalies to monitor cultures.

4. Yield Management with AI

The advent of new technologies such as artificial intelligence (AI), Cloud Machine Learning, satellite imagery and advanced analytics are creating an ecosystem for intelligent agriculture. Fusion of all this technology allows farmers achieve higher average yield and a better price control. Microsoft is currently with farmers from Andhra Pradesh working consultation with Cortana Intelligence Suite including machine learning and Power BI to provide. The pilot project uses an AI sowing App date of sowing, soil preparation, soil test based fertilizer, farmyard manure application, seed treatment, optimal sowing depth and to farmers recommend which has per hectare in 30% increase in the average crop yield out more. The technology can also be an optimal seeding is used to identify historical climate data, MAI in real time from the daily precipitation and soil.

Challenges in AI adoption in agriculture

Although artificial intelligence far reaching opportunities for the application offers in agriculture, there is still to learn a lack of familiarity with high-tech machine solutions on farms in most parts of the world. The exposure to external factors such as weather conditions, soil conditions and presence of pests in agriculture is a lot. So, what might look like a good solution while planning during the start of the harvest, optimum may be changes in the external parameters due. AI systems will also need to train a lot of data machines and to make accurate predictions. In case of extensive agricultural land, although spatial data can be easily detected, temporal data is hard to come by. For example, most of the specific data can be obtained in only once when the plants grow. Since the data infrastructure takes time to mature, it requires a significant amount of time to build a robust machine learning model. This is one reason why AI looks much use in agronomic products such as seeds, fertilizer, pesticides and so on, rather than in the field of precision solutions.

CONCLUSION

The agricultural industry is facing several challenges such as lack of effective irrigation systems, weed, problems with the plant due to harvesting height control and extreme weather conditions. But the performance can be increased using the technique and so these problems can be solved. It can remote as sensors for soil moisture detection and automatic watering to be improved with the help of GPS with different AI driven techniques. The problem faced was the farmers that precision weeding techniques, the large number of crops overcome lost during the weeding process. To improve not only this autonomous robot efficiency, but also reduce the need for unnecessary pesticides and herbicides. Furthermore, farmers pesticides and herbicides can effectively spray in their operations with the help of drones and system monitoring is no longer a burden. For starters, lack of resources and creating jobs caused brain cells in agribusiness can understand questions with the help of people. In conventional strategies huge amount of labor have always stood harvest characteristics such as plant
height, ground conditions and its contents, the manual in this way test, which was tedious. With the support of various systems studied, fast and high throughput phenotyping, destruction would occur with the head of adaptable and advantageous activity, on demand access to information and spatial targets.

REFERENCES


