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Agriculture Field Using In Artificial Intelligence A Literature Survey

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Abstract: *India ismajorly an agricultural country. Various and different crops are cultivated in entire India. It is strange by having different climatic conditions in the same period .No state is devoid of agricultural cultivation. So, it direly needs the introduction and application of techniques and modern developments to boost the agricultural producerto cope up with this population explosion. This paper explains Artificial Intelligence which is novel in engineering science analysis. Unlike the age old traditional methods and applications, it has taken into account the major problemarea in cultivation. It concentrates on the unit pestered and unwellness infestation and emphasizes the insufficient applications of chemicals, improper evacuation and irrigation, weeds management, yields prediction and improving harvest quality by precision agriculture. It also studies disease management, besides monitoring agricultural products and storage control. It recognizes optimal sowing period in various seasons.*
Keyword: *Artificial Intelligence, Agriculture, Internet Of Things, Devices*

I. Introduction

Artificial Intelligence (AI) is one in all the key areas of analysis in engineering science. The major problemsareas included unit pestered and unwellness infestation, inadequate application of chemicals, improper evacuation and irrigation, Weeds management, yields prediction, etc.

AI techniques have enabled us to capture the intricate details of each situation and provide a solution that is best fit for that particular problem.Gradually, terribly complicated issue area units are being resolved with the event of varied AI techniques.

At present in India, Microsoft Corporation is working in the state of Andhra Pradesh with 175 farmers rendering services and solutions for land preparation, sowing, addition of fertilizers and other nutrient supplements for crop. On an average, a 30% increase in crop yield per has already been witnessed in comparison to the previous harvests.

The various area units wherever the solutions for benefitting agriculture involving psychological feature possess information are provided with below.

The hardware solutions like Robot (concerning to crops like corn) has already begun pairing software that collect data with robotics to develop the best fertilizer for the cultivation of crops maximizingthe crop yield and also mostly machine learning techniques are used in crop management process following farming condition management and livestock management. In farming they are used to predict yield and quality of crops as well as livestock production.

Using AI systems to improve harvest quality and accuracy is a management style known as precision agriculture (PA). PA uses AI technology to aid in detecting diseases in plants, pests and poor plant nutrition on farms.

2. The Internet of things Driven Development

There are massive volumes of data getting generated each day in structured and unstructured format. These data are regarding weather pattern, soil reports, new research, rainfall, vulnerability to pest attack**,** imaging through drones and cameras. IoT solutions relating to cognition would sense, recognize and yield smart solutions to enhance crop yields.

There are two primary technologies deployed for intelligent data fusion, namely proximity and remote sensing. The important application of these high resolution data is to test the soil. Unlike remote sensing, proximity sensing doesn't need sensors to be built into aerial or satellite systems; it only requires sensors that are in contact with the soil at a close range. This facilitates in the characterization of the soil based on the soil beneath the surface at a particular region.

3. Farm Beats –Democratizing AI for Farmers Around the world

Ranveer Chandra is the principal researcher behind Farm Beats, a data-driven farming project designed to help increase farm productivity and reduce costs. Farm Beats highlights something essential for our future: AI doesn't replace human knowledge, it augments it. In this case, data from low-cost sensors in soil and drones with machine learning algorithms work with farmers' knowledge and intuition to help them gather and parse data about their farms – informing what, when, and where to plant in order to drive the highest-possible yields and reduce costs.

In just two and a half years, the team behind FarmBeats has iterated on their 2015 Hackathon prototype and created a working system melding technology with traditional agricultural practices.

4. Pest Management

Insect pesterer infestation is one in all the foremost ominous issues in agriculture that ends up in serious economic losses.

5. Disease Management

Crop diseases also are a matter of grave concern to a farmer. Significant expertise and experience is required in order to detect an ailing plant and to take necessary steps for recovery. The image sensing and analysis ensure that the plant leaf images are sectioned into surface areas like background, diseased area and non-diseased area of the leaf. The infected or diseased area is then cropped and sent to the laboratory for further diagnosis. This further renders assistance in the identification of pest and sensing nutrient deficiency.Microsoft is currently taking AI in agriculture a step any.

A collaboration with united element (UPL), India's largest producer of agrochemicals, led to the creation of the Pest Risk Prediction API that again leverages AI and machine learning to indicate in advance the risk of pest attack.

Common pesterer attacks, such as Jassids, Thrips, Whitefly, and Aphids can pose serious damage to crops and impact crop yield. To help farmers take preventive action, the pesterer Risk Prediction App,

providing steering on the likelihood of pesterer attacks was initiated.

6. Agricultural Product Monitoring and Storage Control

Apart from pests and diseases observance, storage, drying, grading of harvested crops also are vital aspectsofagriculture. Thissectionaddresses numerous food observance and internal control mechanismsthat use the thought of computer science.

The agriculture industry now is experiencing rapid growth and adopting advanced technologies in order to bolster the overall yield of the crops. Accessibility of a large number of equipment and state-of-the-art technologies like intelligent monitoring system, drones, robots, among others has totally revolutionized this sector.

*Monitoring Crop Health

*Providing Image-based insights *Managing Environmental Challenges *Precision Farming

7. Soil and Irrigation Management

Issues concerning soilandirrigation management square measure are terribly important in agriculture.

Improper irrigation and soil management result in crop loss and degraded quality.Manek and Singh compared many neural network architecturesinprediction of downfall exploitation four part inputs.

This study found that radial basis function neural networks perform best in comparison to other models. Automation techniques in irrigation andenabling farmers Irrigation is one of the most labor intensive processes in farming. AI trained machines aware of historical weather pattern, soil quality and kind of crops to be grown, can automate irrigation and increase overall yield. Nearly 70% of the world's fresh water resource is utilized for irrigation; such automation can conserve water and benefit farmers in managing their water probs. Yield management using AI. With the emergence of futuristic techs like Artificial Intelligence (AI), cloud machine learning (ML), satellite imaging and advanced analytics are developing an ecosystem for smart, efficient and sustainable farming. The Fusion of these technologies is enabling farmers to achieve higher average yield per ha and better control over the price of food grains, ensuring they remain in profit.

At present in India, in the state of Andhra Pradesh, Microsoft Corporation is working with farmers rendering farm advisory services using Cortana Intelligence Suite including Machine Learning and Power BI, it enables in transforming the data into Intelligent Actions.

This pilot project makes use of an AI based sowing application which recommends sowing date, preparation of cultivable land, fertigation based on soil analysis, FYM requirement and application, seed treatment and selection, optimization of sowing depth suggestions to the farmers which had resulted in an 30% increase in the average crop yield per ha.

AI models can also be employed in recognizing optimal sowing period in various seasons, statistical climatic data, real time Moisture Adequacy Data (MAI) from daily rainfall statistics and soil moisture to construct forecast charts and also carter inputs on best sowing time to farmers.

Forecasting potential pest attacks, Microsoft in collaboration with United Phosphorus Limited is developing a Pest Risk Prediction Application Programming Interface (API) that has a strategic advantage of AI and machine learning to

Signal before, the potential possibilities of gadfly attack.

Grounded on the weather conditions, growth stage of the crop in field, pest attacks are forecast as high, medium or low.

8. Crop Management

In general, crop management systems provideaninterfaceforoverallmanagementofcropscoveringeachaspec toffarming. The idea of using AI technique in crop managementwas first proposed in 1985 by McKinion and Lemmon in theirpaper "Expert Systems for Agriculture.

9. Conclusions

In conclusion the future of farming in the times to come is largely reliant on adapting cognitive solutions. Though a vast research is still on and

many applications are already available, the farming industry is still not having sufficient service, remains to be underserved. While it comes down in dealing with realistic challenges and demands faced by the farmers, using AI decision making systems and predictive solutions in solving them, farming with AI is only in a nascent stage.

To exploit the tremendous scope of AI in agriculture, applications should be more robust. Then alone it will be in a position to handle frequent shifts and changes in external conditions. This would facilitate real time decision making and sequentially utilize appropriate model/program for gathering contextual data efficiently.

The other crucial aspect is the extortionate cost of the various cognitive solutions for farming readily available in the market.

AI solutions have to become more viable to assure that this technology reaches the farming community. If the AI cognitive solutions are offered in an open source platform that would make the solutions more affordable, which eventually will result in faster adoption and greater insight among the farmers.

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