The Influence of Artificial Intelligence with the Internet of Things & Machine Learning in this Growing World

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ABSTRACT

This study explores the impact of AI with IOT & ML in the transformation of this technological era of 2021. Artificial Intelligence with Internet of Things & Machine Learning are based on monitoring and analyzing system. It has great demand and gives accurate predicted output. These technologies bring great convenience & flexibility for people's life & study. Now a days AI, IOT & ML are the trends of progress of engineering science & technology field. This paper gives a first case study of how AI & IOT impact on E-business & how it improves business efficiency. The second case study is how AI & ML combination impact on to reduce risk in agricultural filed & to promote smart farming practices. To promote a better development in social as well as technical field we need to focus on these current trends. These combinations are very effective to solve all the problems in scientific way & makes customer delightful. The compressive study provide solution for autonomous vehicles, smart homes, computer networks, data security, e-business, farming & medical healthcare etc. Finally, this paper has discussed different application scenarios of AI with IOT & ML

Keywords: Artificial Intelligence, Internet of Things, Machine Learning, E-Business, Crop Production

I. INTRODUCTION

Artificial intelligence is an essential technology in modern society progress, and it can bring more substantial advantages by the stimulation and extension of human beings. For the time being, the internet of things can form a huge network system based on related intelligent technology. It has a large capacity and can cover many relationships among people and things. In addition, it can also realize the quick exchange of various information so as to bring great convenience to people's work and life. Artificial intelligence and internet of things can be smeared in autonomous vehicles, smart home and computer network industries. Artificial Intelligence (AI) is a division of computer science which studies building machines capable of intelligent behavior, while Stanford University describes machine learning as "the science of receiving computers to act

devoid of being explicitly programmed".[1] So we can say Machine Learning is a subclass of Artificial Intelligence field. This paper gives case studies of how AI & IOT impact on E-business sectors & AI & ML combination impact on to reduce risk in agricultural filed. Following components are mentioned the relationship between AI with IOT & ML for solving different problems in society.

1.1 Artificial Intelligence

The word "artificial intelligence" was developed by Dartmouth in 1956 for the first time. Since then, related researchers put forward various theories and principles and the concept of artificial intelligence was gradually expanded. There are total three types of development in artificial intelligence field. The first development is all the machineries are replacing with human beings. It conducts all the computational interface & solve all the social and scientific problems. The second development is technological robots. A Robot is a programmable machine developed by the computer. Its adept complex series of engagements spontaneously. Robots can be guided by an external control device or the control may be embedded within. Robots are replacing with the human being to complete some logical and analytical thinking work. The third development in artificial intelligence is to explore all the intelligence data. This system automatically analyzed structured or unstructured large amount of data. It extracts all the valid features and useful information. This system is very helpful in data analysis, data prediction & visualization technology. It has minimum time complexity as well. To apply Artificial Intelligence technology with Internet of Things which provide number of advantages and features in current development. We have explained in this paper AI with IOT in E-business sector area. [1][2]

1.2 Internet of Things

The term IOT belongs to the third-generation information technology and it is a significant technology emerging after internet and computer technology. In 1999, the idea of IOT was put onward for the first phase and then in 2005, it was publicized. Then, in 2009, it realized relatively rapid development. With the rapid development and popularization of IOT, it plays an import role in intelligent technology, induction technology and computer technology fields. Internet of Things this network combines all the variety of things & internet together. It is based on the RFID technology, infrared sensors, global positioning system & other devices of information sensing. Through Internet of Things information will be exchange.[3] The result produced by the system will be intelligent identification, positioning data, tracking, monitor and management of different normal & electronics things. The IOT realize the connection between things and human as well as things and internet. The IOT has divided into three parts separately. The levels are perception level, network level & application level. The perception level sense a collect all data from application environment which contains temperature, humidity, speed, position, vibration, pressure & so on. The network level is like a neuron of humans. It can transfer collected data to data processing system by wireless & wired communication network. The application level is like a working of human brain. Its response all the indications like equipment, environmental, industrial & monitor control. The AI with IOT generally used in smart home agricultural production, medical treatment like x-ray, MRI, City scan & vehicle etc. [4]
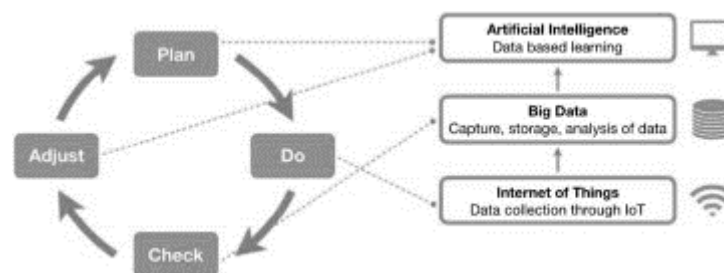
1.3 Machine Learning

ML has afforded different prospects in big data & Hadoop field. Machine learning is a type of artificial intelligence (AI). Which provide more accurate predicted outcome without doing any programmed. The basics of machine learning is to build algorithms that can take input data and use statistical analysis algorithm to predict an output value within an acceptable range. Machine learning is subdivision of artificial intelligence. In artificial intelligence with machine learning we studies to building & train a machine that is capable for intelligent behavior. The goal of ML is to build new or existing algorithms in renovated ways. It learns data from datasets, to build generalized model that gives accurate prediction.[4] To find different & similar pattern data in large amount of dataset. The result of all those things produced self-driving cars, image recognition, speech recognition, text recognition, semantic web, effective web searches & also understanding pattern of human beings.

II. THE CASE STUDIES OF ARTIFICIAL INTELLIGENCE WITH INTERNET OF THINGS & MACHINE LEARNING

Case Study 1: AI & IOT relationship in e-business sector

AI & IOT is main transformative process in E-Business sectors field. It supports all the e-signature, e-

invoicing, e-commerce, internet mobile banking & e-payments etc. E-business platforms are developing exponentially in modern years offering different 7 exciting opportunities. All the mobile phones & electronics devices relate to each other by unique addressing schemes. They are interconnected with each other and achieve predicted goals. In this world, there are 9 billion interrelated devices and from 2021, quantity is predictable extent up to 24 billion devices. 80% of customer interaction are handled by the AI & IOT in 2021 onwards. As the standard of living of the customers is varying and becoming extra adaptive to online shopping. It is becoming essential for the stockholders in this industry which impact technology to deliver services that can lead to consumer happiness. When it moves toward to technology, AI with IOT is the latest thrill. [5]

Fig. E-Business relationship between AI with IOT & ML

Artificial Intelligence in E-Business improve decision making process & provide positive and consistent customer experiences. IOT has automatic & enhancing process which enhancing productivity levels as well as product efficiency. The IOT & AI solutions are integration the amounting pressure of modification and exchanging the landscape of technological encroachment. IOT is about connecting machines and used all the

valid data generated from machine. On other side AI concepts handle all the intelligent and interconnected behavior of all types of machine. The e-business goal is to improve business through the deployment of new technologies. Data processing is becoming very easier with new technologies, platform & system build in. AI with IOT e-business has impacted on business function in every field. These approa11ches will be encouraged for all the youngest entrepreneurs. [5]

Case Study 2: AI & ML monitoring system for crop production

AI and IOT is a great demand and it give an accurate mining and examination of data. The work behind this to reduce the risks in Agriculture and to promote smart farming practices. The influence of physical circumstances like temperature, moisture, humidity is observed using IOT based monitoring structure. Agriculture is the prime source of income, almost 800 million people are hungry and 2 billion suffer micronutrient deficiencies. The key problems for the failure of crop production are absence of nutrients and appropriate environmental disorders. For this purpose, the ML algorithms are applied to the data produced by the method of the IOT.
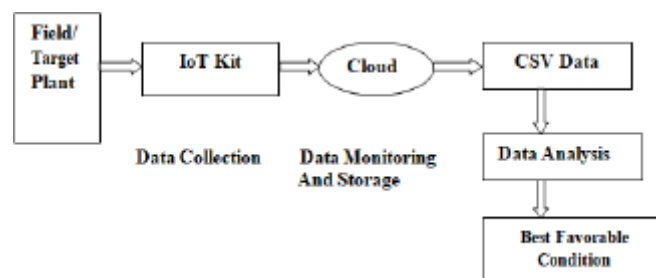

Fig. Crop production monitoring system based on AI with ML & IOT

The main concept here, we first create a dataset with the help of the IOT, and the data collected is stored on the cloud. This data has features consist of physical properties of surrounding like soil temperature, soil humidity, and intensity of light. The target variable for our dataset is the rate of increase in width and height respectively which is the growth rate of the plant. In that, the supervised machine learning procedure is applied to the data which will give the best conditions for the plant for maximum growth. The sensors are uniquely designed for measuring the target parameters. The main use for soil moisture sensor computing the volumetric content of water in the soil. [6]

III. VARIOUS TRENDING APPLICATIONS OF AI WITH IOT & ML

1. Autonomous Vehicles

With the extension and the application of artificial intelligence in the transportation and automobile industry, autonomous vehicles have attracted wide attention from the industrial field, academic circle, and also even the government. The vehicle self-driving shall be realized by following three-way:

1.1 Perception Level: This level collects the working status and the parameter changing status of the whole

vehicle based on different vehicle sensors.

1.2 Decision-Making level: The driving intelligent control program is the same as the human brain, and it can analyze and process the information collected by sensors. For example, they can transform the time data collected by laser and radar sensors into the distance between the vehicle and people and the distance between vehicle and objects.

1.3 Execution Level: The vehicle sensor with high precision and executive and control systems are the key and hot points that need to be studied.

2. Computer Network

Recently, the entire domain is focusing on the innovation and R&D of computer network technology. At some level, artificial intelligence technology can protect computer network safety. Because it can help computer network to establish complete evaluation system based on its strong computing ability and coordination ability.

2.1. Network Safety Management: As computer network technology is deeply and widely used in all trends of life, people have a better understanding of computer network technology recently. Applying AI technology in the management of network safety can help to protect users' privacy.

2.2 The Evaluation of Computer Network System: The expert knowledge base of AI is a complete knowledge base system generated by summarizing the knowledge and experience of experts in various fields and inputting this knowledge and experience into related systems. The solicitation of artificial intelligence in the network system management and evaluation can improve its effectiveness, comprehensiveness, and objectivity. [7]

3. Data Security

Malware has several applications for security. The signature of malware is collected, and ML algorithms are used to forecast the nature of the attack. In other circumstances, ML algorithms can look for patterns in how data in the cloud is accessed, and report anomalies that could predict security breaches.

4. Financial Trading

ML algorithms are getting closer to predict stock market behavior. Many trading firms use ML systems to predict and execute trades at high speeds and volume and, can turn huge profits for the firms.

5. Healthcare

Machine-learning can be used to understand risk factors for the disease in large populations. An example of ML in Health care is image analysis of radiology images, ML algorithms can do this easily and enhance patient care and diagnosis. [8]

6. Aerospace

There are many use cases in the aerospace industry, including image examination and prediction of spiritual objects behavior and attributes. Also, predictive maintenance of aerospace equipment as the apparatuses age and

are used. Aerospace was an early adopter of AI/ML. In fact, many pilots have been flying with very primitive forms of ML for years, autopilots systems all use computer power to make intelligent resolutions.

IV. CONCLUSION

In modern years, there is rapid development & universalization of artificial intelligence with Internet of Things & Machine Learning. The combination of these emerging technologies provides measure gateways of growing technological world. The progress of society & technology based on these recent trends. The impact of e-business enables values, decision making process, support choices & faced many real-life challenges that mentioned in applications. Crop production gives smart farming appliances to each farmer. It should learn from data & train those data for enhanced growth. These AI with IOT & ML rising technologies has continuous development process & greater development prospects in future. It extends from smart life, smart homes, smart applications, smart industries, and smart cities with smart peoples. These combination makes delightful to every consumer.

REFERENCES

[1] Wenbo Yao, The application of artificial intelligence in the internet of things, International Conference on Information Technology and Computer Application, 2019.

[2] Kapil Bakshi, Kiran Bakshi, Considerations for Artificial Intelligence and Machine Learning: Approaches and Use Cases, IEEE, 2018.

[3] Vrushali Dhanokar, "Internet of Things: Future of World", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 9, Issue 3, March 2020.

[4] Dai Qinghong. The analysis of the current situation and application prospect of internet of things [J]. Industry and Application Security, 2018.

[5] Tshepo Alex Malapane, the Impact of Artificial Intelligence and Internet of Things in the Transformation of E-Business Sector, IEEE 978-1-7281-0998-5, 2019.

[6] Richa Singh, Sarthak Srivastava, Rajan Mishra, AI and IoT Based Monitoring System for Increasing the Yield in Crop Production, IEEE International Conference on Electrical and Electronics Engineering, 2020.

[7] C. Verdouw, H. Sundmaeker, B. Tekinerdogan, D. Conzon, and T. Montanaro, "Architecture framework of IoT-based food and farm systems: A multiple case study," Computers and Electronics in Agriculture, vol. 165. 104939, 2019.

[8] Vrushali Dhanokar, "Classifying Chest Pathology Images Using Deep Learning Techniques", International Research Journal of Engineering and Technology, Vol.7, Issue 1, January-2020.