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Artificial Intelligence with the Growth of 5G Technology

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Abstract: With the advent of 5G era, business and industrial applications will face newer challenges, with 5G connectivity, there will be an increase in data volume and to work with every day. It also means that their businesses have to deploy Internet of Things (IoT) infrastructure. In this article, we discuss about the integration of Artificial Intelligence technology and 5G. How will it become a key infrastructure to support the digital transformation of economy and society, that will be assisting in improving development of all walks of life.

Keywords: 5G; Artificial Intelligence; Development

1. 5G Technology and Artificial Intelligence

5G is the 5th generation mobile network. It is a new global communication technology with a network infrastructure with intelligent, fusing energy saving functions together. It is meant to deliver high data speeds, with low latency, increasing availability and better experience to more users.

Artificial Intelligence is a high technology computing science developed with building smart machines capable of performing tasks that typically require human intelligence. Advancement in machine learning creates a shift in every sector of the business and technology world. Artificial intelligence is a simulation of human intelligence in machines that are programmed to think like humans. Deep learning has also enabled automatic learning through absorption of large amounts of data.

There are different types of Artificial Intelligence, what we see today, the systems have been taught or have learnt how to carry tasks without being asked to do so. 5G would then increase the speed and responsiveness of wireless networks while Artificial Intelligence helps with load balancing and increasing efficiencies of devices. With both the network and data advantages that comes together with 5G, used cases like machine learning and in-depth data analysis can be improved and expanded as well.

5G will be making Artificial Intelligence better by having low latency, higher data speed and drives high device density and you would have multiple connected devices. With better improvements in terms of speed, and capacity that 5G can provide, these would also provide greater support for high data transmission, but also embodies the characteristics of higher quality, lesser delay and brings Internet of things to daily lives. From this point of view, the progress brought by 5G has driven further breakthroughs for the future and Artificial Intelligence related fields.

2. Developing trends of Artificial Intelligence

5G communication technology is relatively new and still in deployment in many places, but Artificial Intelligence has reached widespread adoption. They can promote mutually and with deep integration that is able to thoroughly assist in digital transformation, enhanced production methods and changing lifestyle, creating better, wonderful living space for humankind.

2.1 Artificial Intelligence and Industry Development

The research on the integration of 5G communication technology and Artificial Intelligence technology has shown that it would be hastened in the transformation being distributed at the edge or IoT devices. Artificial Intelligence engine has applications for cameras, battery life, security and allowing better network processing. 5G will then cause rapid multiplication of increase in sensors for industrial development. It will directly enable data aggregation for remote monitoring and immediate action. With the growing usage of IoT devices, the devices can operate at the edge and make complex decisions in real time based on the data received.

2.2 Artificial Intelligence and Business Development

AI is the science behind computer systems that perform tasks that normally require human intelligence to act on. These tasks could be visual, language, decision making and speech. With AI taking over, there are concepts such as machine learning, deep learning and general intelligence that is going to reshape the world.

In business, AI has a wide range of uses, in fact we, humans interact with AI in some form or another on a daily basis. It is already disrupting every business process in every industry. They will become a pre-requisite for the successes of businesses who wants to maintain a competitive edge.

Rather than serving as a replacement for human intelligence, it is a supporting tool. AI is valuable through out many industries, whether its just simple help and navigating through, or performing a task as complex as monitoring machineries and prediction to

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when it would break down.

AI is changing the way businesses are run, when it is applied to some of the software platforms, it helps transforms systems that would self-update and correct itself staying on top of manageability. One example with the financial sector is with the usage of AI, it helps with sending reminders for renewals of loans and sends a personalized message to renew the loan application. With the advent of 5G commercializing in this digital age, the efficacy of Artificial Intelligence technology connection will also be further improved, and the various fields such as deep learning, data mining, automatic programming will also be used in different fields.

2.3 Artificial Intelligence and Network Optimization

AI is essential for helping operators to enabled with the ability to optimize quality based on traffic information. The applications within network operators uses advanced algorithms to look out for data patterns with the data sets itself, assisting network operators to detect and predict network anomalies and allow them to fix issues before any major impact.

AI driven analytics helps network operators to provide even better service by usage of the data, the machine learning techniques help to predict future results based on historical data

Network automation and intelligence will be able to find out the root cause of issues and also predict when issues could happen. Artificial intelligence technology can help operators optimize the management of network layer resources. The optimized network operation status can be iterated into the prediction model again to approach the optimal solution.[3]

In each linkage of 5G networks' operations and maintenance, artificial intelligence technology is introduced to analyze and monitor the network quality and service quality in real time; Artificial intelligence technology is used to study and analyze the network data comprehensively. The fault location can be located quickly and accurately, so as to eliminate the fault as soon as possible; The machine learning algorithm is used to optimize the network traffic globally, load balance the whole network, thus being able to avoid network congestion, analyzing the network state, with the combination of business load and network environment, the software will adjust the network parameters adaptively, maximizing the intelligent optimization of the network, improving the utilization rate of network resources, and effectively reducing the network energy consumption. [4]

Combined with the application of 5G communication technology and artificial intelligence at the present stage, the two components have achieved a preliminary integration. To further expand, its development prospect is not limited to network optimization, communications and other aspects.

3. 5G, Artificial Intelligence and Network Security

5G's purpose is to be faster, increased reliability and scale to enable digital transformation, and this will pose a cybersecurity challenge. Great importance should be placed on the comprehensive protection of personal data and information. On the other hand, the deep integration of 5G communication technology and artificial intelligence is the remarkable and inevitable result of science and technological progress. When the quality and speed of data transmission is greatly improved, the possibility of data loss, data theft and other risks will also increase. Once there are risks, people are bound to bear greater losses. This will cause more property security problems. It also will become the next spotlight and focus of the publics' opinion in a very short span of time, which could cause a serious social crisis. Artificial Intelligence (AI), which is used for the development of complex algorithms to protect networks and systems, including IoT systems. [5]

A key benefit of machine learning in cybersecurity also identifies and reacts to problems almost immediately, preventing potential issues from disrupting businesses.

Limitations of artificial intelligence development. There is always a paradox for such a technology shift, as Professor Andrea Jones puts it: "Data existed in the first place because humans chose to collect it and it was supposed to be a tool for humans to use the data." Data is not a complete, or perfect, map of the physical world, but the data also has its own limitations. Combined with the current situation of artificial intelligence research, it does not have the capability of associating and visualize image thoughts, so it can only follow according to the picture, and does not have the ability to draw references from one instance and transfer the application. Therefore, artificial intelligence cannot really replace human thinking, and its flexibility is far less than human thinking.

The most important point is to integrate the perfect cooperation between humans and machines. As artificial intelligence technology being a machine lacks ethical values that humans being are much more emotional.

4. Epilogue

With the continuous improvement of 5G construction, also with the support of 5G communication technology and the development of artificial intelligence technology, we will be able to receive a more convenient and bringing efficient information to society. In this development process, there may be some security risks, while we embrace it, we should reflect the values of both development of artificial intelligence together with 5G communication technology, and promote it together for social and economic development.

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