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Artificial Intelligence

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Shao Weijian, China Customs
shaoweijian@customs.gov.cn



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What is AI?

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Artificial intelligence (AI, also machine intelligence, MI) is apparently intelligent behaviour by machines, rather than the natural intelligence (NI) of humans and other animals. In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of success at some goal.

The traditional goals of AI research include reasoning, knowledge, planning, learning, natural language processing, perception and the ability to move and manipulate objects.



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Why AI is popular now?

- AI has a history of over 60 years.
- Internet and Big-Data support the development of AI.
- Big data: large volume, multi-dimension, comprehensive.
- Google's vehicle for shooting videos of street view can daily produce 1 TB=1024GB=2000 films



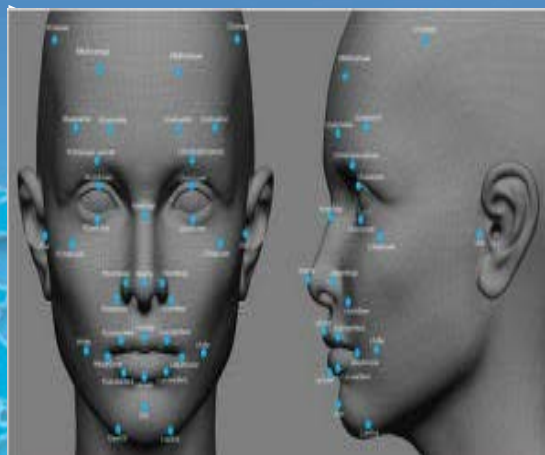
Layers of AI

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First layer computing intelligence

- Robot can calculate and store:
- Supercomputer: Sunway TaihuLight , the fastest supercomputer in the world
- 1 minute by Sunway = 32 years by total human beings (7.2 billion) using calculator continuously.



Second layer perception intelligence

- machine's abilities of vision and hearing can be better than human beings
- Image recognition and face recognition, google and Baidu 's image searching engine,
- speech recognition and understanding (google pixel buds, IFLYTEK),



Third layer cognitive intelligence

- Machine can make cognition and judgment with neural network. The most advanced artificial intelligence.
- AI interpretation and translation, AI automatic grading, and “City's Brain system”
- City's brain system can control the infrastructure, such as transportation, energy and water supply through a neural network



Application of AI in Supply Chain

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1

Intelligent
warehousing

2

Intelligent
operation
system

3

Global
network

4

Transportation
and distribution

5

Intelligent
supply chain
management



Application of AI in Supply Chain

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1)

Intelligent warehousing: unmanned warehousing, with robots installed in the production, such as shelving, picking, handling, packaging, etc.. To enhance efficiency of warehousing, handling, sorting by setting of algorithms to commodity layout, identification, and robot scheduling.

2)

Intelligent operation system: with data analysis and algorithm optimization can command thousands of robots to operate in a coordinated and efficient manner.

3)

Intelligent transport distribution: the use of drone for delivery.



Application of AI in Supply Chain

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4)

Globalization Network: allows the global operation centers operating with links to each other, and forming a global intelligent operation network, and can distribute and deliver cargos to countries and regions around the world, building a global e-commerce business network.

5)

Intelligent supply chain management: such as Amazon's intelligent supply chain model of "autopilot", which can automatically predict, procure, replenish, warehouse allocation, inventory adjustment according to customer demand for accurate delivery, thus can make precisely management to mass inventory of goods. The whole process is almost zero human intervention.



Application of AI in Customs

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1)

Intelligent Customs logistics supervision equipment: robots supervision (face recognition), intelligent image examination (image recognition)...

2)

Intelligent Supervision system: with big data, cloud computing, expert system, intelligent risk analysis system, as well as the IoTs, we can create intelligent Customs Supervision System.





Application of AI in Customs

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3)

Intelligent collaboration system with other Customs: data exchange, mutual recognition of controls, mutual recognition of AEO, and mutual administrative assistance.

4)

Intelligent collaboration system with other government agencies: single window, information integration and sharing, collaborative supervision.

5)

Intelligent Customs and Business cooperation: Intelligent AEO services, intelligent monitoring.





Advantages of AI in Supply Chain and Customs control

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Efficiency in Supply Chain

Warehousing, intelligent transport control, global network, intelligent supply chain

Security in Supply chain

Intelligent control to the entirely end-to-end supply chain

Saving Human Resource

Robots, unmanned warehouse, unmanned supervision

Efficiency in customs supervision

Intelligent equipment, intelligent supervision system, collaborative supervision

Better customs services

Intelligent service for AEOs



Risks of AI

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Error rate

Large number of multiple related decision-making will lead to an relative error rate.

Difficulties in data sharing

In a competing environment, it is difficult to share data.

Robustness and security

How to guarantee the robustness and data security?

Unemployment

Many people will lose their jobs

Abuse of AI

How to prevent the abuse of AI?



Relations of AI and other DTs

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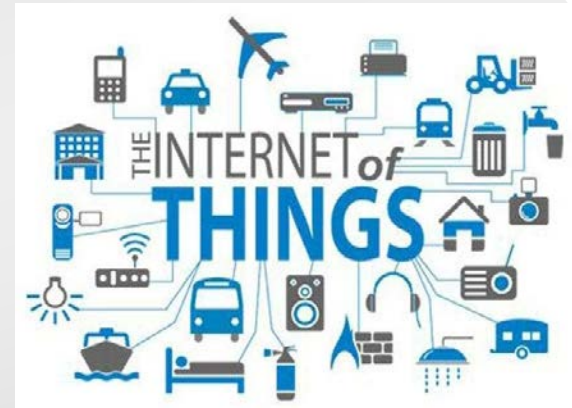
AI and Blockchain

Blockchain is a kind of chaine data structure that combines data blocks in sequential order and combines in chronological order, and a distributed ledger guaranted in a cryptographic way which can not be tampered and unforgeable. Blockchain can produce AI.



AI and Internet of Things

IoT can be connected to a large number of different equipment and devices. The sensors embedded in each product will continually upload new data to the cloud. These new data can later be processed and analyzed by AI to generate the required information and continue to accumulate knowledge. AI can maximize the value of IoT, and IoT can provide the required data flow for the AI.





Relations of AI and other DTs

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AI and Robot

Robot is a programmable machine. And it is usually able to perform a series of actions autonomously or semi autonomously. AI involves computer programs to accomplish tasks that require human intelligence.



AI and biometrics

Biometrics is the identification technology using the inherent physiological characteristics of human body, such as fingerprints, face, iris, and behavioral characteristics, including handwriting, sound, gait and other identification methods. Collecting data through biometrics is an important part of AI applications. With the continuous accumulation of the database, the algorithm is further optimized, AI will expand to more applications.





Conclusion

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AI has a wide application space in supply chain and customs supervisions and services, and the employment of AI with other disruptive technologies will greatly improve the efficiency of supply chain and customs management under appropriate control of the risks.



Recommendations

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1. Increase the research and development of the use of artificial intelligence and other disruptive technologies in supply chain and Customs control and service for securing and facilitating trade and providing better services.

2. Using the AI and other disruptive technologies to strengthen cooperation of Customs to Customs, Customs to trade and Customs to other government agencies.

3. Working on measures on preventing the risks and negative effects raised by AI and other disruptive technologies, such as privacy security, abuse of AI, and unemployment.



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