

Best Practice Cases

For The United Nations Sustainable Development Goals

SenseTime's Committee of AI Ethics and Governance





Insist on originality and let AI lead human progress

Facing the world, SenseTime insists on originality and is committed to using AI to promote economic, social and human development, and build a better future.

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Goal 1: No poverty

- » Case 1: State-Intensive advances in Agriculture Blockchain
- » Case 2: Using machine learning plus satellite, Stanford can identify poor areas from space

Case 1

State-Intensive advances in Agriculture Blockchain

1.1 Abstract

Blockchain + agriculture will become a new revolution in the supply chain in the world today. This year's No.1 document of the Central Committee clearly pointed out: "Relying on existing resources to build agricultural and rural big data centers, we accelerate the application of modern information technologies such as the Internet of Things, big data, blockchain, artificial intelligence, fifth-generation mobile communication network and smart meteorology in the agricultural field." For the first time, blockchain was placed at the forefront of AI and 5G, and it also pointed out that the application scene of blockchain covers agricultural products logistics, traceability, supply chain management and other fields.

In addition to the No.1 document, the General Office of the Ministry of Agriculture and Rural Affairs also issued the Key Points of Rural Industry Work in 2020. It is mentioned that information technology should be the way to drive the integration of business forms, promote the integration of new-generation information technologies, such as the Internet, the Internet of Things, blockchain, artificial intelligence and 5G, biotechnology, with agriculture, and develop digital agriculture, smart agriculture, trust agriculture, adoption agriculture and visual agriculture.

1.2 Analysis

Agriculture is the world's largest employment sector, providing livelihoods to 40% of the world's population today, and is the largest source of income and employment for poor rural families. According to the SDG2 guidance of the United Nations Goals for Sustainable Development, we will double agricultural productivity and double farmers' income by 2030. However, as the oldest industry on the earth, the development of agriculture is significantly slower than other industries. Problems such as the long industrial chain and the high dispersion of operating entities also limit its pace of transformation and upgrading.

As a distributed storage database technology, blockchain has the characteristics of decentralization, untampered ability and traceability. Distributed ledger can record and update the status of crops from planting, management to harvest, storage and transportation, processing and delivery. Shared records can ensure that agricultural data will not be lost, and the query can be made in real time. Its combination with agriculture would be advantageous to drive the faster development of the latter. The maximum value of blockchain application to agriculture lies in to maximize the elimination of information asymmetry, improve the information transparency and timely response ability of the whole industrial chain, so as to realize industrial appreciation and bring direct economic value to agricultural practitioners.

Take this epidemic as an example. Due to the information asymmetry, the sales of agricultural products in some poor areas were not smooth when affected by the epidemic prevention and control and quarantine measures, and the income decreased sharply, while it was difficult for urban residents to buy vegetables and fruits daily. If all links of the agricultural product supply chain can be added to the block chain-based traceability system, and then match the unsalable products with the difficult purchase information through big data, both problems will be well solved.

1.3 Pictures



Case 2

Using machine learning plus satellite, Stanford can identify poor areas from space

2.1 Abstract

In many third world countries, a full set of economic variables is hardly available and extremely unreliable due to weak infrastructure and a lack of cooperative ability to collect data and share data. However, the lack of high-quality data hinders economic development in the region.

However, this situation currently has a chance to change. Scientists from the Stanford University Center for Computer Research have found a new way to accurately identify poor areas (published Aug. 18 in Science), using machine learning with satellite images to successfully identify the economic conditions of five African countries.

An examination of the intensity of nighttime lighting is not a fashionable indicator of measuring the level of economic activity in a region. But for extremely poor areas, it is difficult to judge directly from the night lighting situation. Because judging from satellite images, the night is equally dark in most extreme poverty areas of Africa.

The novelty of Stanford's study is the use of a machine learning technology called "transfer learning" to identify poverty in two steps. First, models were built to predict night lighting by machine deep learning of about 4,096 economically related indicators in high-resolution daytime satellite images, including roads, downtown, and waterways. Then, combined with the Population Health Organization and the World Bank's existing research, the model will be modified to complete the identification of poverty.

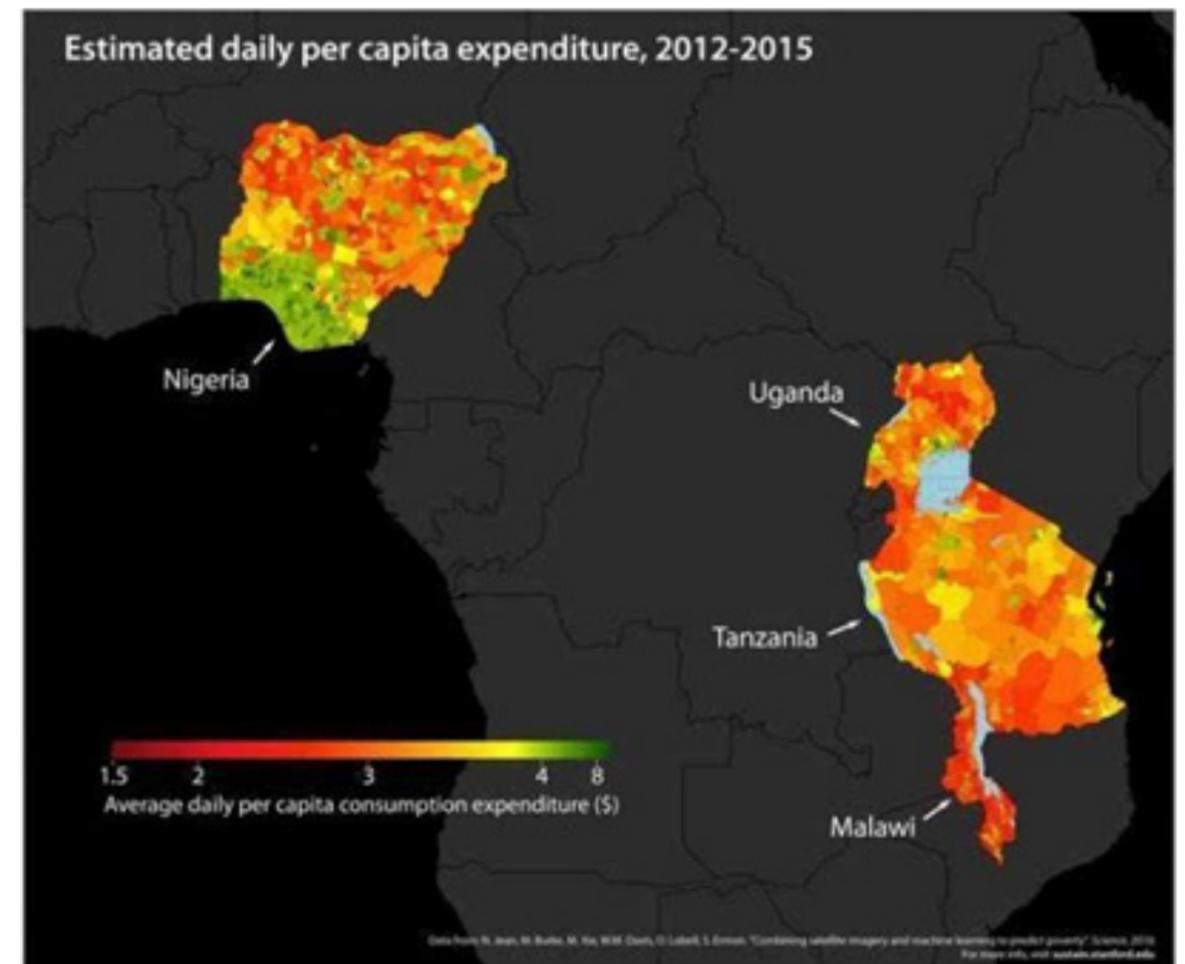
In this way, the prediction of regional poverty level can achieve levels of 81% -99% accuracy, which can help economic aid organizations manage and distribute materials more efficiently, reducing aid costs while helping more poor people.

2.2 Analysis

Poverty has become one of the long-standing dilemmas facing human civilization in the 21st century. According to world development indicators, about 42 percent of the world's population and nearly 2.6 billion people are living in poverty. An important premise for eliminating poverty is to identify poverty. As the case says, in economically backward countries and regions, governments are difficult to afford high economic research costs, some of which are still in political turmoil, and data on poverty is highly missing. This poses no big obstacle to international aid.

Compared to traditional door-to-door surveys, the machine learning method combined with satellite imagery greatly reduces survey costs, and the data access channels almost all come from public information, making this method easier to generalize and replicate.

2.3 Pictures





Goal 2: Zero hunger

- » Case 1: Agricultural AI identification pests — "eye" agricultural technology service platform
- » Case 2: The Future of Agriculture: AI harvesting robots have new flexibility skills

Case 1

Agricultural AI identification pests — "eye" agricultural technology service platform

1.1 Abstract

Huiyun Information deeply integrates artificial intelligence with agricultural production decision-making technology, let computers simulate the human brain neural network, and then think like human beings, understand and understand agriculture like agricultural experts, and finally let AI serve the agricultural field. The intelligent identification engine "Yun eye" independently developed by Hui Cloud Information can realize the automatic identification of crop diseases and insect pests, crop physiological state identification, rapid estimation of crop yield, pesticide query, feasibility detection of pesticide redistribution scheme, intelligent recommended drug use scheme and other scenarios.

When users find abnormal crops, they can shoot the leaves or fruits through their mobile phone to the eye, you can identify whether the crop suffers from diseases, pests and pests, and obtain control measures. When users need to judge the current physiological state of the crop, they can take pictures of the crop through their mobile phone and upload them to the eye, they can intelligently identify whether the crop physiological state is healthy or not, and provide personalized production management plans for plot specific crops. Through mobile phone or drone shooting, Yun can quickly identify the number of fruit, and some categories can be classified according to fruit maturity. Say goodbye to the artificial fruit count, save a lot of time and manpower, a more accurate grasp of the orchard yield.

1.2 Analysis

Agriculture is both the oldest industry of human beings and the foundation of human civilization. After the industrial Revolution, the production of grain was increased greatly due to the application

of machinery in the agricultural field. However, high production costs, shortage of land resources, agricultural ecological environment damage, crop diseases and insect pests and other problems are still the bottlenecks restricting agricultural development. According to the FAO, the global population will exceed 9 billion by 2050 and demand for food will increase by 20%. How to increase agricultural output in limited arable land, while maintaining sustainable development is the main problem facing agriculture.

The fundamental way out to solve the above problems is to empower agricultural production with science and technology. Artificial intelligence serves the agricultural field, helps farmers to plant crops more scientifically and conduct more reasonable farmland management, and effectively improve crop yield and agricultural production efficiency. We will promote the transformation of agricultural production into mechanization, automation and standardization, accelerate agricultural modernization, and promote sustainable agricultural development.

1.3 Pictures



Case 2

The Future of Agriculture: AI harvesting robots have new flexibility skills

2.1 Abstract

Agricultural robotics and AI company Root AI has announced new features for its AI enhanced robotic harvester, plus more than \$7 million. Today, robotic harvesters enhancing AI have shown increased flexibility to handle crops of various shapes and sizes, helping with technology to remedy those vulnerabilities.

In the past, the robotic harvester Virgo (was called Virgo) and harvesting ripe tomatoes from vines. In indoor agricultural environments, Virgo can be located on tracks between various crop lines. When the robot sails in the greenhouse, it uses a lot of sensors and artificial intelligence to analyze the location and maturity of crops, then uses specialized grippers to pick agricultural products when ready. In the latest video "Going Cross-Crop", the robotic harvester Virgo shows picking cucumbers and strawberries in the field. The company called Virgo "the world's first robot to replicate people's ability to harvest multiple crops".

2.2 Analysis

Poverty has become one of the long-standing dilemmas facing human civilization in the 21st century. According to world development indicators, about 42 percent of the world's population and nearly 2.6 billion people are living in poverty. An important premise for eliminating poverty is to identify poverty. As the case says, in economically backward countries and regions, governments are difficult to afford high economic research costs, some of which are still in political turmoil, and data on poverty is highly missing. This poses no big obstacle to international aid. Compared to traditional door-to-door surveys, the machine learning method combined with satellite imagery greatly reduces survey costs, and the data access channels almost all come from public information, making this method easier to generalize and replicate.

2.3 Pictures





Goal 3: Good health and well-being

- » Case 1. Artificial intelligence–assisted diagnosis system shows its skill
- » Case 2. A I assisted diagnosis of COVID–19
- » Case 3. A I big data analysis of the epidemic trend
- » Case 4. Detection and Prevention of AI
- » Case 5. Artificial intelligence to fight infectious diseases
- » Case 6. Facebook self–residue detection function

Case 1

Artificial intelligence–assisted diagnosis system shows its skill

1.1 Abstract

With A I incorporated into the national strategy and the "new infrastructure" system, A I technology will play a positive role in upgrading China's medical industry. Sensetime not only uses A I to provide doctors with intelligent auxiliary tools to improve the efficiency of hospital diagnosis and treatment, but also continues to explore the frontier, break through the boundary of A I applications, and lead the sustainable development of the A I medical industry.

From auxiliary diagnosis and treatment, precision surgery to drug mining, AI+ medical treatment has rich application scenarios. Take SenseTime SenseCare intelligent diagnosis and treatment platform as an example. "time saving people, time, effort and precision" are the four values brought by AI image assisted diagnosis to the hospital.

Is adhering to the "based on medical big data, service clinical treatment" this concept, SenseCare wisdom treatment platform based on platform of flexible expansion, has launched including chest CT, chest X line, heart coronary, pathology, bone tumor and other product solutions, covering more than 13 human parts and organs, for multiple clinical AI power, help clinicians for high precision disease detection, typing, good and malignant prediction multidimensional analysis, and 3D preoperative planning and simulation treatment design.

During the COVID–19 period this year, S e n s e C a r e Chest C T intelligent clinical solutions immediately rushed to key COVID–19 screening hospitals in Beijing, Shanghai, Tianjin, Shandong, Hebei, Fujian and other provinces, providing an efficient and accurate decision–making basis for front–line medical workers. "By introducing intelligent S e n s e C a r e lung A I analysis products, we can realize intelligent diagnosis and quantitative evaluation of COVID–19 C T images, and complete quantitative analysis within a few seconds to automatically screen suspected images." Qingdao West Coast New District People's Hospital radiology director Wang Qijun said. The secret behind Wang Qijun and his team to issue inspection reports in the shortest time to avoid long–time retention and reduce the risk of cross–infection is artificial intelligence (AI) –assisted diagnosis.

1.2 Analysis

The problem of difficult and expensive medical treatment is very prominent in China, mainly manifested in two aspects. One is the uneven distribution of medical resources. According to statistics, tertiary hospitals have nearly 90% of high-tech equipment and excellent medical personnel in the current medical service system. Serious insufficient medical equipment, low doctor density limit limited treatment ability and often need to be referred to large hospitals for subsequent diagnosis and treatment or conservative treatment; Second, primary hospitals are crowded, but tertiary hospitals and clinics are overcrowded every day, and the low proportion makes doctors under high pressure and disputes. In addition, combined with the sudden COVID-19 outbreak, the peak pressure of the "wartime" medical system cannot be met by relying on the traditional medical mode.

In the face of the above situation, through the supply-side reform, in addition to increasing the supply of medical resources, the use of AI technology to improve the use efficiency of medical resources is one of the effective ways to quickly alleviate the current shortage of medical resources:

First, through the AI algorithm to assist doctor diagnosis and treatment, can greatly reduce the burden on doctors, release the energy and time to handle more urgent events, diagnose and treat more patients, do more focused communication with patients, while reducing the pressure of the medical system is conducive to the benign development of doctor-patient relationship.

Second, the AI algorithm implements the expert experience and knowledge map digital, standardization, can copy and output, increase the overall supply of medical resources, quickly improve the medical level of grassroots hospitals, make patients in developed or remote areas, can be nearby, enjoy the basic homogeneous medical services, promote the balanced development of medical and health resources.

The application and promotion of AI in the medical field is in line with the Sustainable Development Goal III (SDG3) and Target Ten (SDG10) — advocated by the United Nations to reduce inter-regional gaps and human inequality caused by insufficient resources and unequal distribution, ensuring that everyone has the power to pursue a healthy, happy life.

1.3 Pictures

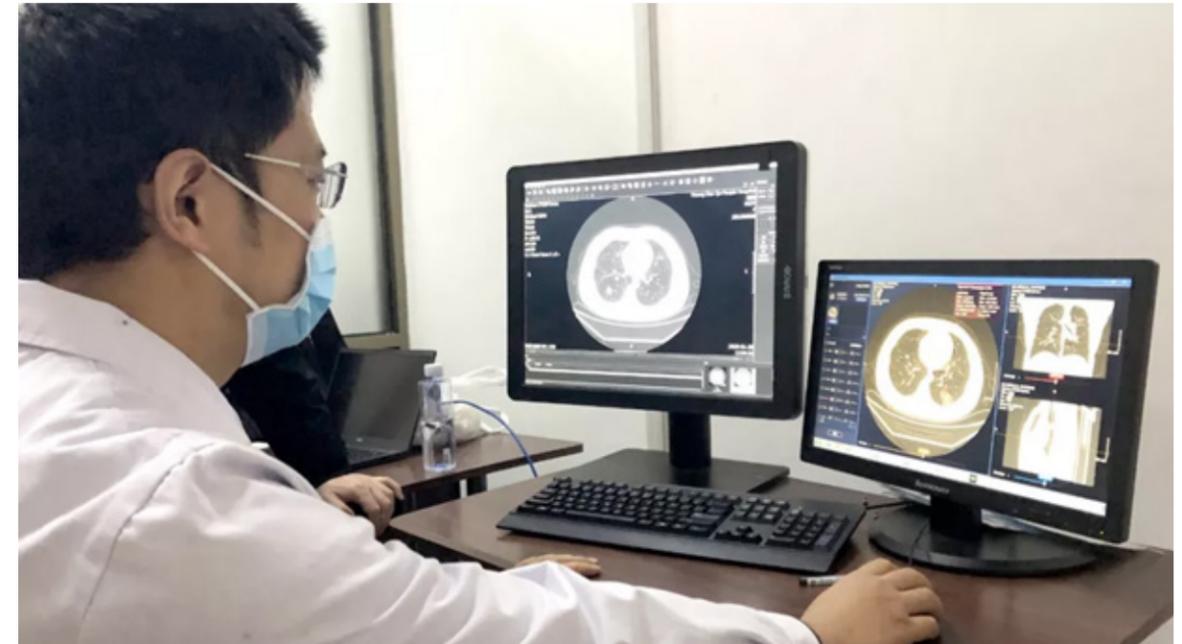


Figure: Qingdao West Coast New Area People's Hospital uses the SenseCare intelligent diagnosis and treatment platform for diagnosis



Case 2

AI Assisted diagnosis of COVID-19

2.1 Abstract

On February 15, Alibaba Damore Hospital and Ali Cloud jointly produced the "COVID-19 A I Auxiliary Diagnosis Assistant", which can help doctors quickly diagnose suspected cases, thus making AI excel in the fight against the epidemic.

Specifically, damhospital joint ali cloud for COVID-19 clinical diagnosis developed a new A I diagnosis technology, can read in 20 seconds of CT image, distinguish COVID-19, common viral pneumonia and healthy image, according to the texture characteristics of suspected COVID-19, and directly calculate the proportion of lesion site, the analysis results accuracy reached 96%.

In the fifth version of the protocol released by the National Health Commission, in addition to nucleic acid testing, the clinical diagnosis of CT imaging can also be used as the criterion of COVID-19 cases. It is understood that the imaging characteristics of CT chest slices in COVID-19 patients show subtle changes such as multiple single or double lungs, plaque shape or segmental ground glass density shadow. A COVID-19 patient has about 300 CT images, which puts great pressure on the clinical diagnosis, and the visual analysis of the CT images of a case took about five to 15 minutes.

To this end, Dharma medical A I team based on the current latest treatment, zhong authoritative team published on COVID-19 patients clinical characteristics, etc., and zhejiang university, cloud, long-term good and Cooper hospital institutions, take the lead to break through the limitations of insufficient training data, based on more than 5000 cases of CT image sample data, learning, training sample lesion texture, developed a new AI algorithm model.

2.2 Analysis

The problem of difficult and expensive medical treatment is very prominent in China, mainly manifested in two aspects. One is the uneven distribution of medical resources. According to statistics, tertiary hospitals have nearly 90% of high-tech equipment and excellent medical personnel in the current medical service system. Serious insufficient medical equipment, low doctor density limit limited treatment ability and often need to be referred to large hospitals for subsequent diagnosis and treatment or conservative treatment; Second, primary hospitals are crowded, but tertiary hospitals and clinics are overcrowded every day, and the low proportion makes doctors under high pressure and disputes. In addition, combined with the sudden COVID-19 outbreak, the peak pressure of the "wartime" medical system cannot be met by relying on the traditional medical mode.

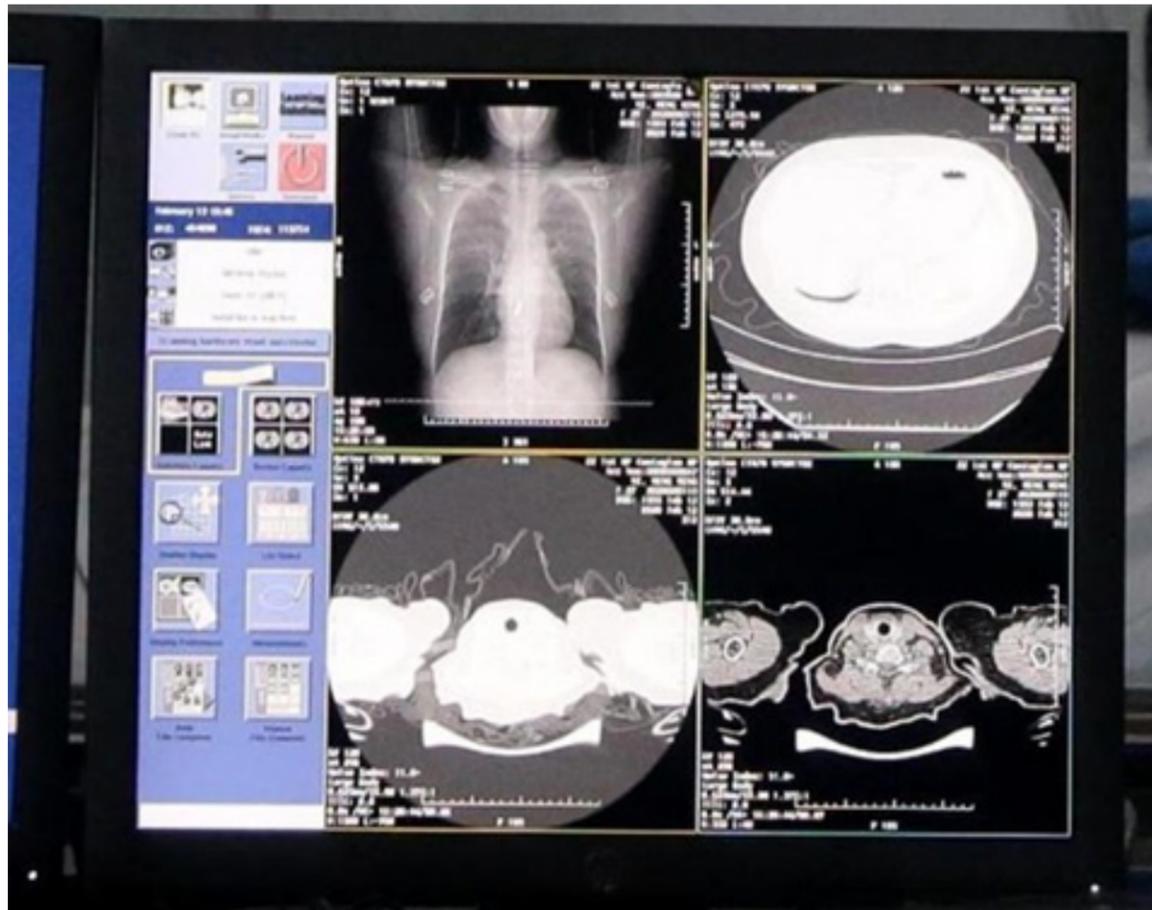
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The application and promotion of artificial intelligence in the medical field is the concrete embodiment of SenseTime's A I ethical principles, and is also in line with the UN advocated Sustainable Development Goals (S D G 10 and S D G 3) — to reduce the regional gap and human inequality caused by insufficient resources and uneven distribution, to ensure that everyone has the power to pursue a healthy and happy life.

2.3 Pictures



Case 3

AI big data analyzes the trend of the epidemic

3.1 Abstract

Researchers from Hefu A I Technology Organization have developed an online COVID-19 prevention and control A I program, to provide necessary reference for the people to deal with the epidemic, strengthen protection, and promote the benign dissemination of information.

He Fu built A I supervision platform "national COVID-19 trend prediction" function based on the national health commission released the real release data, through big data machine learning, virus transmission dynamics, nonlinear numerical approach, time series analysis, combined with the 2003 national SARS outbreak development trend model, at the same time refer to the classic model of infectious disease transmission SIR and SEIR, optimized the epidemic development prediction model.

The source of big data analysis of the Holford A I Supercomputer Center is based on the real release data released by the National Health Commission, based on the ratio of cases detected in overseas travel and overseas evacuation, and tracing the initial infections with high confidence through the statistical model. Moreover, the S E I R model and numerical fitting of epidemic diseases are used to analyze the future trend of the epidemic. Meanwhile, we combine data statistics and parameter search. Finally, machine learning uses integrated learning ideas to provide confirmed case prediction.

3.2 Analysis

This case well reflects the principle of A I benefit to the people advocated by SenseTime. The original intention of A I application should be inclusive, taking meeting people's yearning for a better life as the landing point of scientific and technological innovation. Health is the premise and foundation for people to achieve a better life. During the epidemic, super transmissionists development of the epidemic to malignant transmission. This case is also in line with the pursuit of the Sustainable Development Goals (SDG3), eliminating the elimination of harm to human health caused by infectious diseases and promoting the health and well-being of all age groups.

3.3 Pictures



Case 4

Detection and prevention of AI

4.1 Abstract

In addition to targeting close contacts and suspected infected people, the resumption of work in big cities is also a contagious hazard. In the "isolation" process of the virus, the advantage of artificial intelligence is played incisively and vividly. The first is to measure the temperature, although at present, supermarkets, companies and other places are equipped with remote sensing thermometer, but for large public places, in a short period of time with ear temperature gun / frontal temperature detector for traffic personnel measurement pressure, thermal imaging equipment as non-contact temperature measurement tool, can cover a larger area, improve traffic speed, reduce group gathering time. However, thermal imaging camera sensors generally have low resolution and take few available pixels at long distance, such as pedestrians wearing masks, glasses and wearing bangs blocking their forehead or hats, which will also bring certain degrees of interference to temperature measurement, which brings certain challenges to the current epidemic prevention work.

To this end, the regional traffic module of SenseTime A I intelligent epidemic prevention solution has innovatively applied A I technology to thermal imaging measurement. The soft and soft solution composed of SenseTime Xingyun series intelligent temperature measurement screening terminal, thermal imaging camera, black body and intelligent temperature measurement screening system makes the development of epidemic prevention work more efficient and more accurate! SenseTime A I algorithm integrates infrared imaging and visible light imaging technology, based on its high-precision human temperature smoothing model, can effectively reduce the temperature drift of thermal imaging cameras, realize the accuracy of pedestrian frontal temperature measurement within $0.3\text{ }^{\circ}\text{C}$, and further reduce the dependence of temperature measurement system on black body, so as to ensure the reliability of the application effect in some scenarios that cannot be used, and meet the standards for preliminary screening of epidemic prevention and control. When a suspected body temperature of more than 37.3°C is detected, the system will capture and make sound and pop-up reminders in time to facilitate secondary verification.

4.2 Analysis

AI and thermal imaging technology, realize the rapid, large area of "contactless" temperature screening, compared with the traditional temperature measurement, greatly improve the epidemic prevention efficiency, timely discovery and control the abnormal situation, reduce the risk of cross infection, in the prevention and control of the epidemic has played a major role. The use of this system is also in line with the AI benefit principle advocated by SenseTime and the Human Health and Wellbeing goal (SDG3) advocated by the United Nations, using technical means to effectively prevent epidemic prevention and enhance the country's ability to control health risks.

4.3 Pictures



Case 5

Artificial intelligence to fight infectious diseases

5.1 Abstract

Throughout human history, the epidemic crisis has always existed. Establishing a perfect system to fight against it is an important survival battle for human beings. The key to reducing the pandemic is the early detection of potential pathogens before a massive outbreak, giving public health departments and researchers ample time to respond, but this is not easy. Microsoft uses AI technology and genomics to monitor scalable monitoring to detect infectious disease threats early, such as continuous monitoring how specific insect types (such as mosquitoes) transmit pathogens through the blood, Microsoft's cloud genome also tries to identify and analyze all biological and virus types in the environment to determine early patterns of disease transmission. Microsoft also use AI in infectious disease diagnosis — on the basis of a lot of infection data training, AI can through the analysis of data and image scanning, assist the grassroots inspection department to identify infection pathogen intelligent algorithm, intelligent image recognition to help grassroots doctors identify different kinds of fungi, improve the detection rate of infection pathogens, so as to provide accurate and personalized medical services. Dai Beijie, senior project manager at Microsoft Asia Research Institute, will also introduce how Microsoft can use AI technology to improve human awareness of infectious diseases, strengthen the fight against the epidemic, and drive the development of human health care through scientific and technological innovation.

5.2 Analysis

This case well reflects the principle of AI benefit to the people advocated by SenseTime. The original intention of AI application should be inclusive, taking meeting people's yearning for a better life as the landing point of scientific and technological innovation. Health is the premise and foundation for people to achieve a better life. During the epidemic, super transmissionists played a key role in the transmission of the virus. The traditional use of manual investigation is low efficiency, second, many potential virus transmission relations are easy to be missed, losing the opportunity to find or control super communicators. Rapid classification of disease files through machine learning, the establishment of virus

transmission path and transmission relationship, are conducive to the early investigation of super communicators, and effectively control the development of the epidemic to malignant transmission. This case is also in line with the pursuit of the Sustainable Development Goals (SDG3), eliminating the elimination of harm to human health caused by infectious diseases and promoting the health and well-being of all age groups.

5.3 Pictures



Case 6

Facebook self-residue detection function

6.1 Abstract

In November 2017, Facebook launched the active detection feature, which scans posts to detect patterns that may indicate whether the user is considering self-harm.

When it detects a suicide mindset, a program driven by AI sends mental health resources to the person, sometimes to his friend. Facebook supports the AI program through human resources, such as trained hosts, partnerships with local mental health organizations, and relationships where appropriate with local first responders. For example, in a video shared in the Facebook newsroom, upstate New York Sheriff Joseph A. Giras explained how his department received a call about a young woman who threatened to hurt herself. Thanks to Facebook's AI-driven testing program, local police were able to be notified and able to locate the woman via their mobile phone ping. They were then able to take her to the hospital, thus saving her life.

6.2 Analysis

WHO estimates that the global suicide deaths far exceed the total deaths of war and murders in the same year. The highest suicide rate occurred over the age of 70, with suicide being the second cause of death in 15 ~ people 29 years of age. Statistics show that the number of suicide deaths in China is about 130,000, the suicide rate in rural areas is significantly higher than that in cities, and the suicide rate of the elderly increases significantly. Mental illness is closely related to suicidal behavior, with 40% of suicide deaths experiencing depression during suicide and patients with affective disorders at 10 times higher risk of 4 ~ than other psychiatric disorders.

Suicide is a public health problem that cannot be ignored, ensuring public physical and mental health and reducing suicide mortality are related to human health and well-being. If the detailed process and medical history of suicide behavior can be understood, that is, effective suicide prevention strategies

can be developed for vulnerable groups. In the current society, social network is often the main channel of people vent emotions and tell suffering, using AI technology on the Internet, "through" suicide thoughts, identify suicidal thoughts, and its timely psychological treatment and intervention, can help ease the burden of suicide groups, is undoubtedly an effective means to prevent suicide.

6.3 Pictures





Goal 4: Quality education

- » Case 1. Himalaya's first screen intelligent hardware Xiaoya AI Library was officially released
- » Case 2. SenseTime Technology escorted thousands of primary and secondary schools in 100 districts, and the popularization of AI basic education did not "fail"
- » Case 3. AI search technology enables college entrance examination volunteer filling

Case 1

Himalaya's first smart hardware with a screen Xiaoya AI library was officially released

1.1 Abstract

On August 6, 2020 at 20 PM, Himalaya released the first new smart screen hardware product, — Xiaoya AI Library. The emergence of Xiaoya AI Library can trigger reading anytime and anywhere. The time for exercise, running, driving, and doing housework can all become the time for reading, and it will be easier for people to get information and knowledge. Xiaoya AI Library will recommend suitable content according to users' listening habits. 100 content experts strictly choose good content for the whole family, and accidentally meet the good content they like.

By scanning the front cover through the front camera of Xiaoya AI Library, Xiaoya will match audio resources in a massive content library, and users can fill in the audio books they want to listen to to the cloud bookshelf.

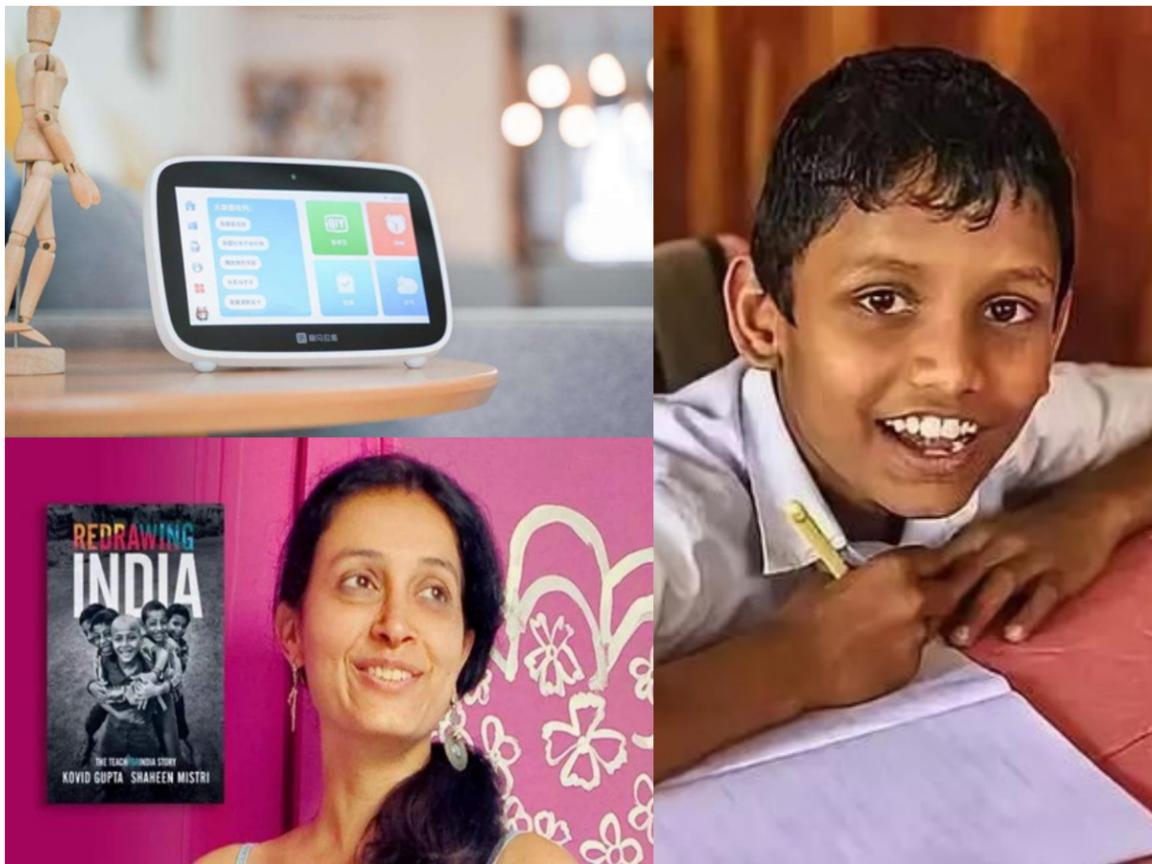
Xiaoya AI Library can intelligently sense owners home, support a language automatic broadcast function, so that reading can seamlessly extend to life. In the future, Xiaoya AI Library will also support good morning, good night and other intelligent content scenarios, to provide more humanized use experience, so that good content can flow out, so that reading can accompany users all the time.

1.2 Analysis

Educational fairness is the foundation of social equity and the starting point of life equity. The United Nations has proposed the future-oriented Global Sustainable Development Goals, one of which is quality education: it requires countries to ensure inclusive and fair quality education and promote lifelong learning opportunities for all people.

Xiaoya AI Library has lowered the threshold for people to obtain knowledge and broadened the boundary of learning. Both the elderly, children and some reading or vision disabilities can more easily obtain good content suitable for them by "listening and reading", and enjoy lifelong learning opportunities as ordinary people. At the same time, through AI means can also reduce the scarcity of educational resources, so that people in poor areas have the same right and opportunity to access knowledge, realize educational equity, help improve the overall education level and national literacy, and lay a solid talent foundation for economic development.

1.3 Pictures



Case 2

SenseTime Technology escorted the primary and secondary schools in 100 districts, and the popularization of AI basic education does not "fail"

2.1 Abstract

Affected by the epidemic, how to ensure the normal development of teaching work under the premise of effective prevention and control of the epidemic has become the primary consideration.

The world's leading artificial intelligence platform company SenseTime technology for provinces and cities of teachers and students develop "AI basic education knowledge online learning" solution, including AI science video, SenseStudy AI experimental platform, AI teacher training video and live, public class, the second international middle school students artificial intelligence exchange exhibition, online remote teaching products solutions and other products and services. The solution is provided free for primary and secondary schools in need, to ensure that after the official opening of the school, on the basis of no additional academic burden of students, the frontier knowledge of science AI, to further improve the cognitive level of teachers and students.

2.2 Analysis

The COVID-19 epidemic has brought unprecedented challenges to global education, and more than 1 billion students around the world are unable to study in school normally due to the epidemic. During this period, colleges and universities all over the country have tried to "suspend classes" through online teaching, and staged an unprecedented scale of online teaching practice. Through the experience and exploration of this epidemic, the deep integration of education and teaching with the Internet and AI technology has reached an unprecedented height. Through the rapid training and online teaching practice in the early stage, the teachers have also simultaneously improved their information literacy, laying a foundation for the popularization of long-term and large-scale online education.

Artificial intelligence and education practice to explore pratt & whitney every student, similar to business soup science A I distance teaching products, let the spread of knowledge no longer has a threshold, let the popularization of knowledge is not "off", more let the children in remote areas can also enjoy the best education resources and courses, truly realize the fair right of high quality education resources.

2.3 Pictures



Case 3

AI search technology enables college entrance examination volunteer filling

3.1 Abstract

Quark Search provides AI tools for the whole process of intelligent matching, AI admission prediction, simulation filling, professional personality test, college PK, and new college entrance examination selection. Among them, AI admission prediction introduces subdivided university and professional dimensions, greatly improving the guiding value of intelligent prediction and analysis. Simulated to fill in the +AI analysis suggestions, to give candidates more intuitive voluntary decision-making assistance.

Data show that a series of quark AI tools exclusively developed by themselves, with a strong professional and practical, let the overall use of the college entrance examination AI tools increased 8 times compared with last year, college query, professional query, evaluation, AI admission prediction, personality test and the most popular.

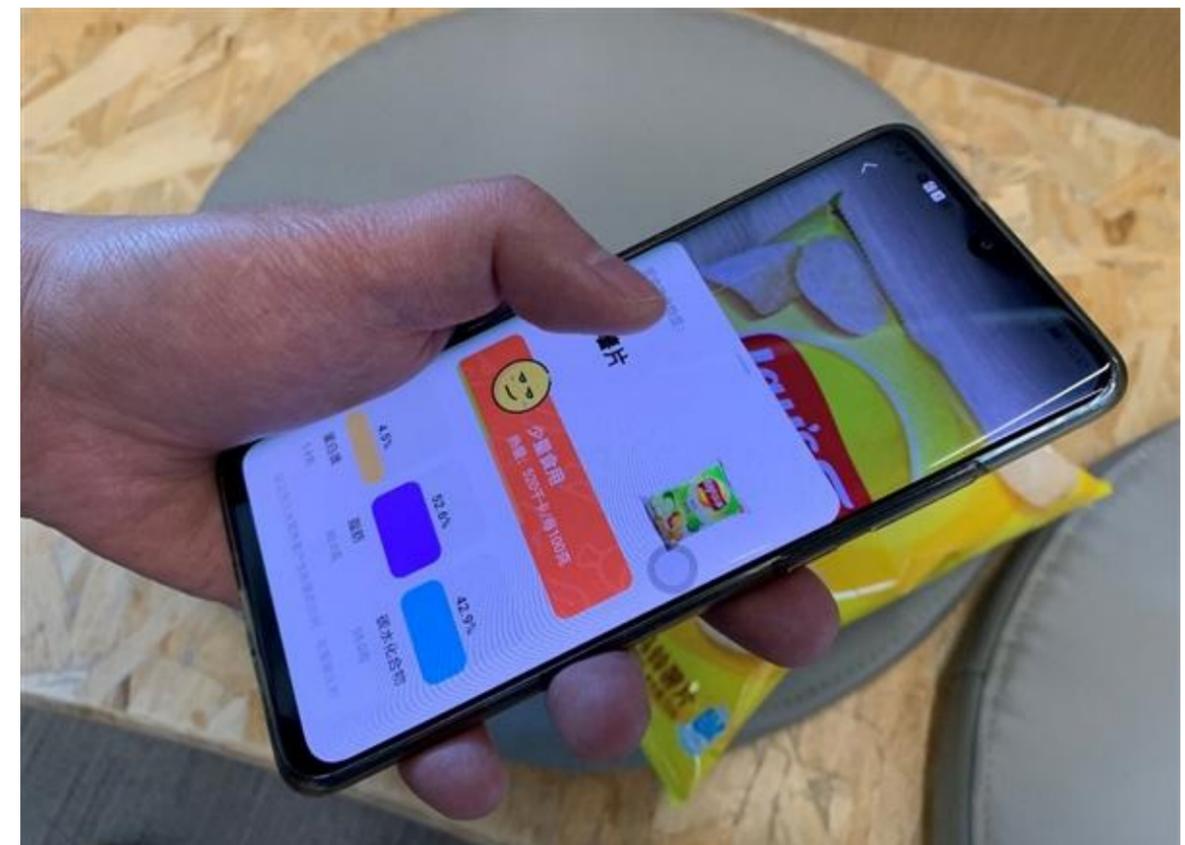
At the same time, the volunteer form management function launched by the Quk college entrance examination, universities, majors and cities, match the scores, interests, employment, actually generate more than 3 million candidates, equivalent to the 2020 National College Entrance Examination, every three candidates in the use of Quk college entrance examination AI volunteer filling service.

3.2 Analysis

Voluntary filling of the college entrance examination may be related to the future positioning and development of students. In the face of nearly 3000 universities, more than 500 unknown professional direction, and professional career trend and development direction, for many families and candidates are a great information, and very complex life choice, professional, credible targeted guidance has always been

scarce, only a few people can obtain. Using AI technology to fill in the college entrance examination gives everyone the opportunity to obtain high-quality and personalized analysis and suggestions, and achieve fair competition in the face of important choices in life.

3.3 Pictures





Goal 5: Gender equality

» Case 1. The UN CGF "Gender equality" project was launched

Case 1

The UN CGF "Gender equality" project was launched

1.1 Abstract

With the mission of "Let data technology serve the well-being and freedom of people", Mana Data Foundation thus launched the "Promoting Gender Equality for AI algorithms" project, which is to explore the new characteristics and trends of gender equality in the era of artificial intelligence. The project was supported by the ninth batch of the United Nations–China Social Gender Research and Advocacy Fund (CGF).

Project head first listed the face recognition, intelligent recruitment, finance and other fields of artificial intelligence algorithm sex discrimination cases, then with the help of social constructionism, social data and technology feminist theoretical framework analysis artificial intelligence algorithm two causes of sex discrimination, namely social influence further solidified into the algorithm, artificial intelligence technology of "female perspective" in innovation. Finally, put forward four action programs: moral algorithm, algorithm transparency: establish algorithm review and evaluation mechanism, to users to do algorithm interpretation, introduce algorithm design female perspective, break the inherent gender discrimination, as well as basic research and academic advocacy, ability building and policy and social advocacy and other major intervention measures.

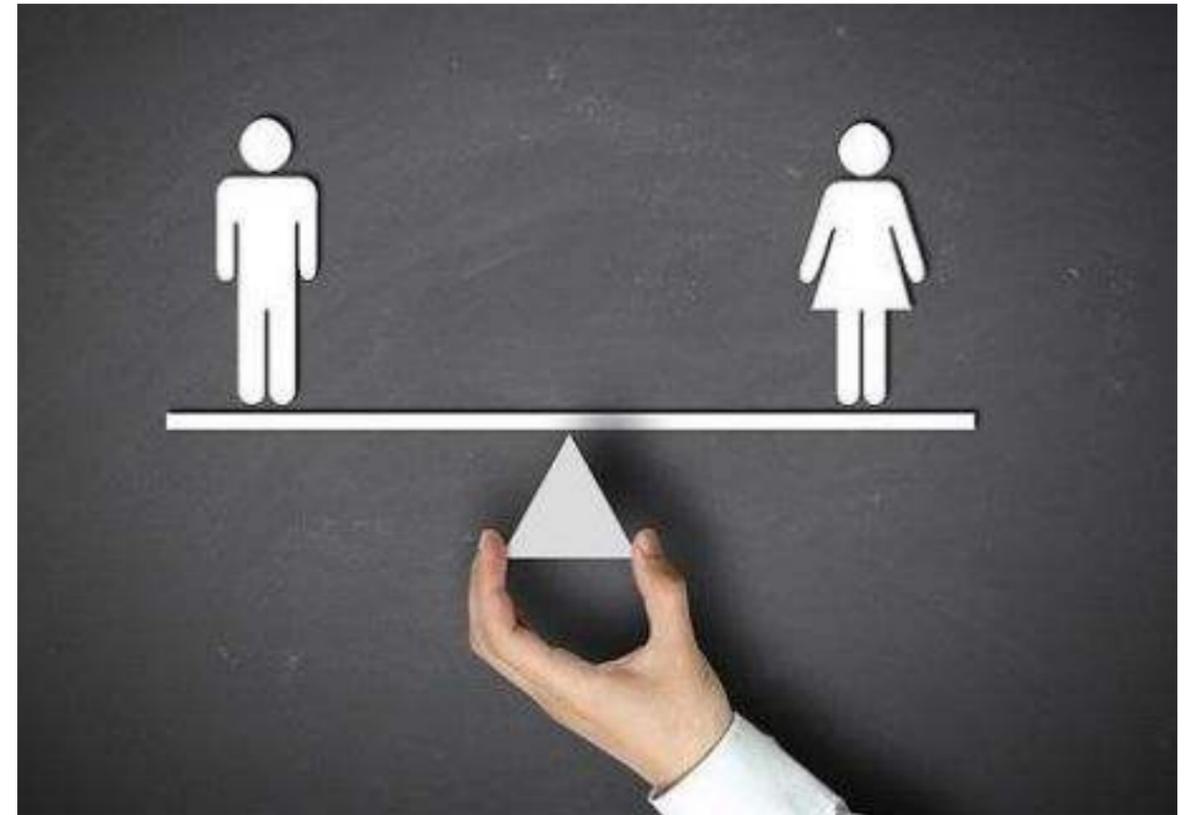
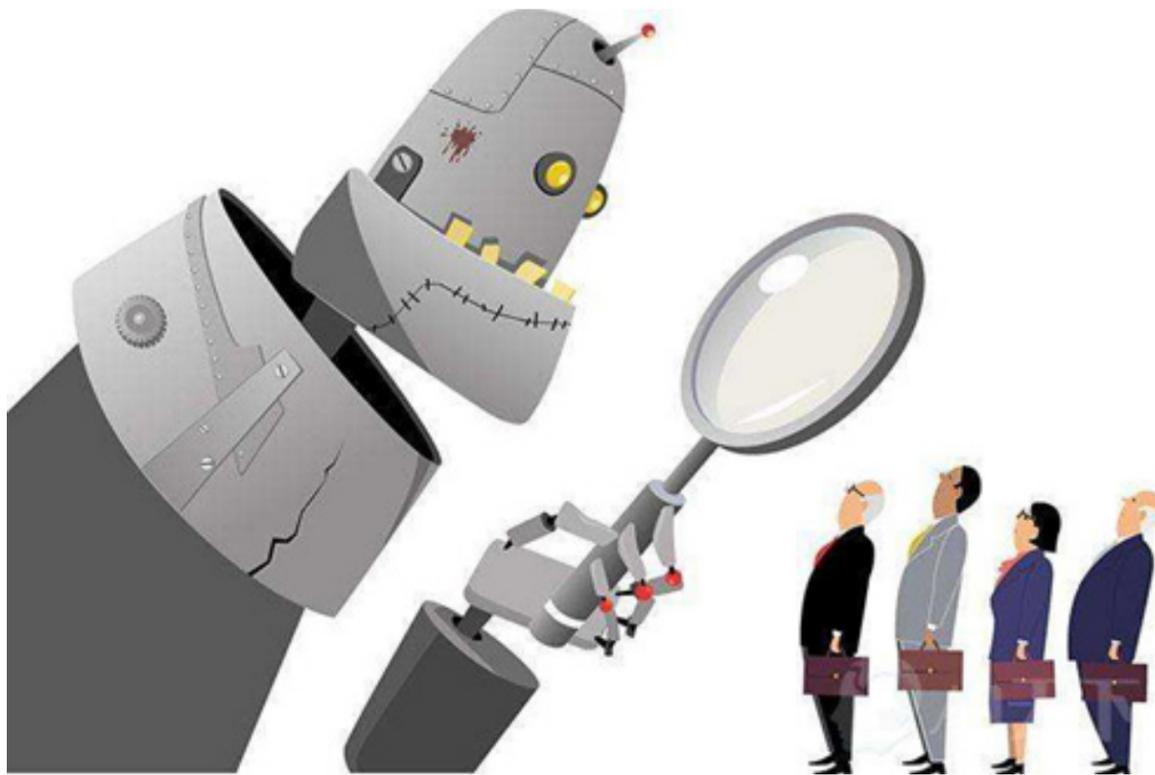
1.2 Analysis

Algorithm as the core of artificial intelligence, bring human opportunities also brought some risks, in the actual application process will often appear bias conclusion or feedback, the most typical is "algorithm discrimination" phenomenon is more serious, to a kind of social groups invisible unequal treatment, such as gender mentioned in case bias. Therefore, when algorithmic discrimination collides with the rational value of human beings, the problems brought about deserve our vigilance.

On the one hand, "algorithmic discrimination" is rooted in the reflection of the inherent social bias in human beings, and on the other hand, data is also one of the key variables, mainly coming from the one-sidedness of data collection. To overcome the adverse consequences of algorithmic discrimination, we should not only establish a set of ethical review standards for AI algorithms based on prohibiting discrimination or equal protection purposes, but also enhance the transparency of intelligent algorithms.

As Danella Keats Sittram noted in his paper Technical Due Process, "Given that intelligent algorithms increasingly determine the results of various decisions, people need to construct technical fairness specification systems, ensure fairness realization through procedural design, and strengthen the transparency, cenability and interpretability of intelligent decision-making systems with the legitimacy of technical procedures".

1.3 Pictures





Goal 6: Clean Water and sanitation

» Case 1. Smart water: a new trend of drinking water in urban residents in the future

Case 1

Smart water: a new trend of drinking water for urban residents in the future

1.1 Abstract

In 2017, yinchuan strive to build wisdom community, to Jane water investment to local pipeline direct drinking water project, orderly covers more than 80 communities in Yinchuan city, government buildings, schools and hospitals, benefiting nearly hundreds of thousands of users, completely solved the problem of poor drinking water, water for many years, CCTV for a special report.

According to Jane water investment, vice President of Jiang Jianhua, the company attaches great importance to the research and development of new technology and new materials, its core technology is mainly based on aerodynamic water separation system and multilayer regeneration separation system, through big data and artificial intelligence, real-time online water quality monitoring, in addition, the company will regularly ask a third party water quality testing, provide a comprehensive water quality detection report.

1.2 Analysis

Drinking water safety is a top priority in China. Health and social problems arise in areas with poor water quality. In China, 190 million people get ill and 60,000 die from water pollution (such as liver cancer and gastric cancer); about 300 million people face drinking water shortages. In the spot check and testing of groundwater in 198 cities across the country, the poor and extremely poor testing points accounted for 57.3%, and the water quality problem has become our health hazard.

Water quality monitoring information is a direct reflection of the water quality situation, and plays a vital role in the overall water environmental protection, water pollution control and even maintenance of water environmental health. Traditional water quality monitoring mainly adopts the method of field manual

sampling and laboratory instrument analysis. This method is not only inefficient and has a large sampling error, but also does not timely reflect the water quality changes. The application of artificial intelligence to conduct real-time monitoring, intelligent detection of water quality conditions and timely early warning to make precautions, to control the water pollution problems from the source, can minimize the problem of water pollution, to ensure the safety of residents' drinking water.

1.3 Pictures





Goal 7: affordable clean energy

» Case 1. Artificial intelligence quickly integrates into the power grid

Case 1

Artificial intelligence quickly integrates into the power grid

1.1 Abstract

Integrated infrastructure is one of the important contents of the new infrastructure, which mainly refers to the deep application of the Internet, big data, artificial intelligence and other technologies to support the transformation and upgrading of traditional infrastructure, and then form the integrated infrastructure, such as intelligent transportation infrastructure and smart energy infrastructure.

On March 29, the maximum load of 13.9 million kilowatts, and the power volume was 2.738 billion kilowatt-hours. The day before the day, the "China Southern Grid Schedule cockpit AI load forecast template" had calculated these data.

The application of AI technology to load prediction is only an example of intelligent technology integration into the production field of China Southern Grid. According to the "intelligent equipment, intelligent operation" promotion application ideas, "difference" period, the southern power grid company will focus on promoting image intelligent recognition, UAV automatic inspection, cable tunnel robot inspection, fiber vibration online monitoring mature technology, pilot promote the beidou high-precision positioning, UAV cluster operation, amphibious robot inspection operation and other new technology application.

1.2 Analysis

The basic policy of China's electric power development is to improve energy efficiency, protect the ecological environment, strengthen power grid construction, vigorously develop hydropower, optimize coal power, actively promote the construction of nuclear power, encourage new energy power generation,

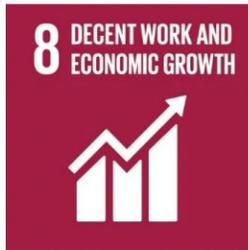
and deepen institutional reform. Under the guidance of this policy, China accounts for a more and more large proportion in intelligent grid investment. According to the State Grid Intelligent Planning General Report, the 2009–2020 State Grid invested 3.45 trillion yuan, among which 384.1 billion yuan, accounting for 11.1% of the total grid investment, and, according to different time stages, the later planning, the higher the proportion of intelligent investment. This shows that the development of the Chinese power grid is developing towards the intelligent direction. It can be predicted that in the future, China's electric power development will show the remarkable characteristics of high automation level, economic efficiency, environmental protection, technological progress and accelerated industrial upgrading.

The application of AI technology to the power industry is not only an inevitable choice for the development of the power industry, but also an important strategic support for energy and power transformation. Artificial intelligence technology in power grid construction, management, decision-making, management (operations) and other fields have broad application prospects, will improve the grid scheduling ability, improve power energy efficiency, ensure energy security, better serve economic and social development, which is also in line with the United Nations advocated sustainable development goals SDG7, to ensure that everyone obtain affordable, reliable and sustainable modern energy.

1.3 Pictures



Photo: Production workshop of Nanjing Guodian Nanzi Automation Co., Ltd. under China Huadian



Goal 8: decent work and economic growth

- » Case 1. IBM for AI-based learning
- » Case 2. The FInSight AI lab enables AI for financial scenarios
- » Case 3. Another way for banks to use AI is to send a mobile alert to help prevent fraud
- » Case 4. AI enables a new tourism experience

Case 1

IBM for AI-based learning

1.1 Abstract

For IBM to introduce AI technology into learning activities with impressive results. IBM uses AI to develop Your Learning, which is a personalized digital learning market, with 98% of IBM employees averaging quarterly visits. IBM employees average 60 hours a year. IBM employees can browse the most popular learning resources of their colleagues, sign up for targeted learning channels, and study the skills and certifications needed to prepare to apply for the hottest positions in the company. Learning about chatbots can answer questions in 24 / 7 ways. As a result, on IBM's AI-driven learning platform, enrollment and course completion rates rise, enabling companies to accelerate access to strategic skills.

IBM demonstrated a statistical association between employee learning volume and overall engagement. Business impact studies show a direct relationship between learning and performance; others show that the stronger employees want to learn, the better their overall performance. More importantly, the net recommendation for IBM learning content has been high. As skill half-lives get shorter, AI-based learning ensures IBM employees remain evergreen.

1.2 Analysis

In the era of digital economy, talent is the first driving force for enterprise development. — serves the development of the enterprise with talents, gathers talents with enterprise development, and finally realizes the benign interaction between enterprises and talents. Therefore, for enterprise managers, talent reserve is the first priority. In this regard, in addition to recruiting suitable talents, because the half-life of knowledge and skills is getting shorter and shorter, and the enterprise competition is increasing, in order to match the enterprise development speed and strategic goals, it is also necessary to create a staff learning and growth environment within the enterprise, to ensure that the staff skills remain

evergreen. Traditionally, in order to cultivate employees' skills, internal training courses in enterprises are often not targeted, and employee participation is relatively passive and not active. In addition, due to the lack of channels and learning objectives, the self-study efficiency of employees is generally low.

IBM, through AI technology, provides a personalized learning platform for employees, which can conduct targeted learning according to job needs, interests, and personal career development goals. This integration of AI technology can transform passive learning into active learning, make learning more sense of goal, and help employees to improve learning efficiency, second, through employee learning data statistics, the enterprise cognition of talent reserve more granular, help to efficient matching of positions and talent, let each employee can "teach according to their aptitude", gain a sense of achievement, confidence and decent, form a benign atmosphere of talent and enterprise interaction, further consolidate the talent competition, to promote enterprise innovation and development.

1.3 Pictures



Case 2

The FInSight AI Lab enables AI for financial scenarios

2.1 Abstract

Based on five core technologies, such as artificial intelligence, big data, blockchain, cloud platform and financial application, FInSight AI Laboratory is committed to helping financial institutions comprehensively improve their risk control and operational capabilities, and realize the rapid upgrading of operation and management level and efficiency.

Recently, the livelihood bank and pan titanium customer technology, pan titanium customer technology will provide professional consulting services, covering market, risk control, operation, IT plate, build a complete wisdom financial solutions, the future will gradually build high degree of specialization, and have continuous business support "characteristics of the people's livelihood" automobile consumer financial system.

And in terms of "intelligent risk control", pan titanium guest technology with the whole process perspective grasp the potential financial risks, on the basis of deep understanding of fraud business knowledge system, through artificial intelligence machine learning technology, enrich customer portrait dimension, establish risk control model, solve the traditional risk control mode online scene failure problem, improve the level of risk management, create a healthy and sustainable automobile consumer finance market environment.

2.2 Analysis

The essence of finance is risk control, and the emphasis on risk control is the key to achieve inclusive finance. As the finance of all kinds of social groups, inclusive finance pays attention to the comprehensiveness and universality of financial services and emphasizes providing financial services to poor areas, ethnic minority areas, remote areas and poor people. It has become an important starting point for targeted poverty alleviation and a key issue to realizing the UN Goal for

Sustainable Development SDG8. However, due to the particularity of inclusive financial services groups with high risks, solving the risk control problem of inclusive finance determines whether inclusive finance can be further developed.

Most of the risk control of traditional financial institutions is carried out by traditional labor, because of the high cost of KYC, the service objects mainly focus on institutions and natural persons with certain asset threshold and qualifications. Take banks as an example. At present, among its main service objects, 100% of large enterprises, 90% of medium enterprises, small and micro enterprises 20%, and 60–70% of farmers still borrow money through private finance. In a few years ago, some Internet financial institutions, mainly operate online, this business model gives fraudsters the opportunity to take advantage, so it faces the risk of fraud and multiple lending.

The essence of risk control is to solve the problem of information asymmetry, wisdom risk control combined with artificial intelligence, blockchain, big data core technology, it is for traditional institutions and Internet companies facing risk control pain points, using technology to reduce KYC information cost, combined with more multidimensional, more rich big data basis, will default, fraud and other financial risk control within a reasonable range, so as to provide pratt & whitney financial products for the public.

2.3 Pictures



Case 3

Another way banks use AI is to send mobile alerts to help prevent fraud

3.1 Abstract

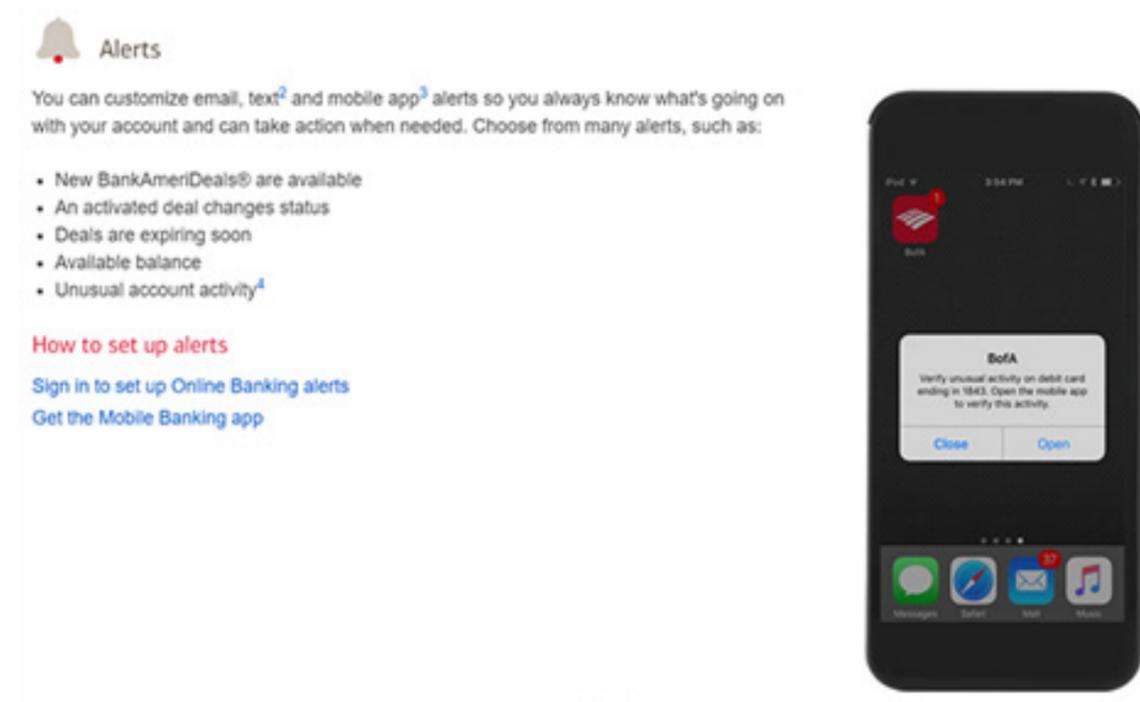
Another way banks use AI is to send mobile alerts to help prevent fraud. For example, if an unusually large transaction occurs on your account, you may receive a warning alert on your phone. Alternatively, if you suddenly start buying in another state, it may be marked as fraud prevention, requiring you to call the bank to verify the purchase in person.

By tracking your daily financial transactions, such notifications can be made, enabling AI to recognize abnormal patterns in your consumption habits.

3.2 Analysis

Inclusive finance means that a large number of ordinary people will be integrated into the financial system, and at the same time, the sinking of financial user groups also means that more customers may face or be exposed to security risks such as financial fraud. In the era of inclusive finance, the magnitude and level of financial data are far beyond users' imagination. In the way of manual verification, the response speed and cost are far from meeting the needs of financial anti-fraud. The best way is to rely on big data and AI technical capabilities to quickly identify suspicious data from massive financial data, so as to achieve the three purposes of ensuring real users, submitting information, financial needs and use. Only on the premise of effectively preventing and controlling financial fraud, and reducing default and other financial risks, can the real implementation of the sustainable development goals of inclusive finance be promoted.

3.3 Pictures



Case 4

AI enables a new travel experience

4.1 Abstract

SenseTime hopes to enhance the quality of tourism through AR. AR can help us to restore the scene, achieve history reproduction, and enhance the tour experience. AR navigation, through the 3D scene reconstruction, can be achieved, allowing visitors to interact with the virtual toy dragon, get the understanding of the 3D scene, or load a variety of decorations and interactions.

SenseTime technology also developed AR digital person technology, can provide private customized tourism services, can lead tourists to understand tourist attractions, explain historical allusions, talk about the more interesting surrounding things, and interact with customers. It can identify and analyze people, understand our language, talk with people, and have physical interaction. Digital people can also conduct the analysis of customer groups, can provide intelligent services, to replace the daily tedious work. Customized digital image of scenic spots according to the needs of scenic spots and customers.

4.2 Analysis

Tourism has played an increasingly prominent role in driving national economic and social development. It is an important industry for the country to stabilize economic growth, promote national consumption and adjust its industrial structure. During the 12th Five-Year Plan period, tourism contributed more than 80% of the added value, accommodation, civil aviation and auxiliary service industry, which is one of the most active industries in the modern service industry.

However, the current Chinese cultural tourism development mode is mainly driven by resources, its development mainly relies on the historical and cultural resources "overdraft" development, investment is mainly concentrated on the scenic area infrastructure and public service system and other gross heavy

asset investment, the lack of depth of historical humanities, excessive form (commercial), insufficient content (culture).In terms of demand, with the enrichment of people's material life, the form of tourism has also changed from "sightseeing" to consumption with cultural experience.The relative lag on the supply side leads to the poor tourist experience, which is not conducive to the local cultural export and the sustainable development of tourism.

Through artificial intelligence, augmented reality and other technologies to give cultural tourism new functions and experience.The immersive experience scene built by A R, A I brings subversive interactive experience to tourists, let tourists truly feel the history and humanity in the superposition of virtual and reality, form a high additional commercial value with experience as the core, and promote the transformation of traditional tourism consumption mode to modern cultural tourism experience consumption mode.

4.3 Pictures





Goal 9: Industry, innovation, and infrastructure

- » Case 1. The industrialization process of "intelligent perception and interaction"
- » Case 2. The first pilot study of industrial visual positioning AR technology of China Southern Power Grid
- » Case 3. Huawei helps with the operation of Tianjin Port 5G port business performance evaluation and monitoring system

Case 1

The industrialization process of "intelligent perception and interaction"

1.1 Abstract

Intelligent perception and interaction can be divided into two major capabilities, namely, machine perception capabilities such as vision, hearing and touch, and human-computer interaction capabilities such as voice and action. The former is biased towards perceptual recognition, while the latter is biased towards application scenarios.

Intelligent perception is mostly about information transmission through camera, microphone or other sensor hardware devices in the physical world as "media". These "media" map the input content to the digital world, making cognition, understanding, memory, planning, decision-making, and so on.

Human-computer interaction is based on a variety of perceptual hardware devices to achieve instant interaction or other information transmission in specific scenarios. For example, in the field of autonomous driving, such sensing intelligence is realized through lidar and other sensing devices and AI algorithms. Home intelligent audio is also an application of speech recognition and interaction, by learning specific to contextual maps.

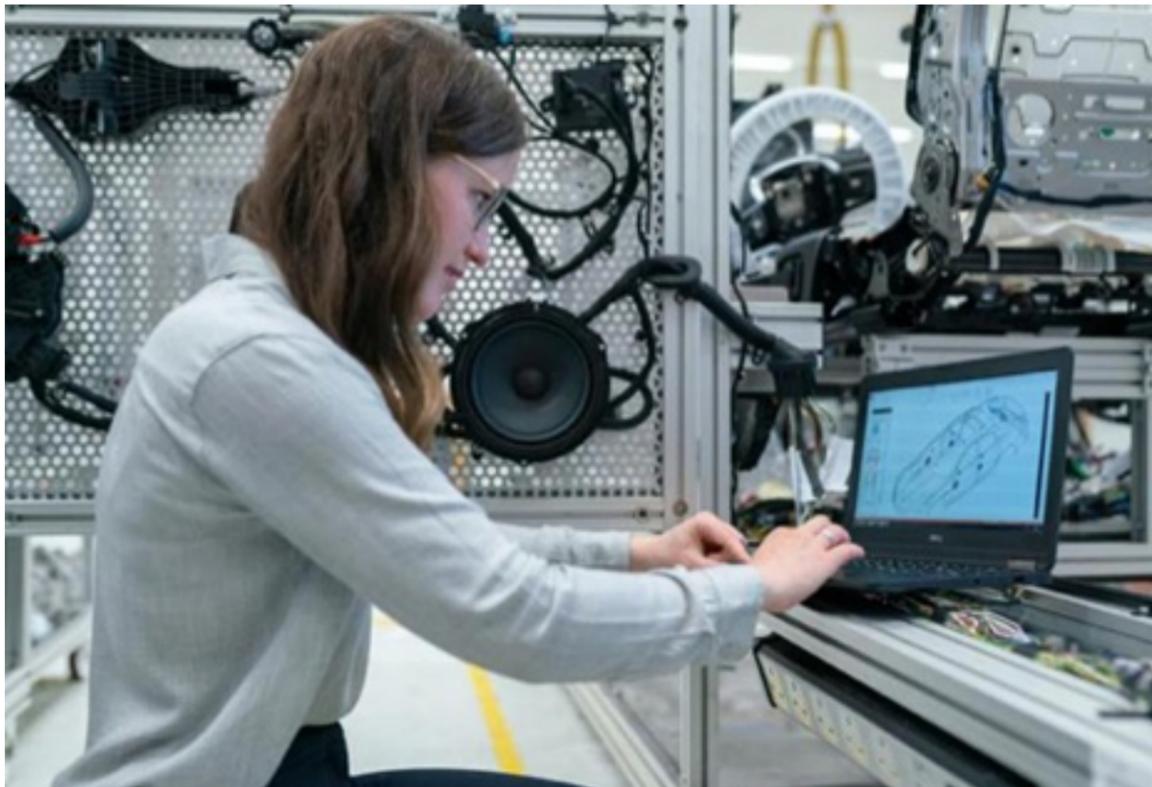
In the future, intelligent perception and interaction will be applied with more industrial scenarios, including warehousing, logistics, port, chemical industry, energy, etc. Intelligent perception interaction can play greater effects in the field of higher degree of mechanization.

1.2 Analysis

Only by every scientific and technological revolution is deeply combined with industrial manufacturing and promoting the fundamental reform of the manufacturing mode and production

organization mode, can we drive a leap in productive forces. The strategic position and head goose effect of artificial intelligence should be reflected in the deep integration with industrial manufacturing, thus promoting the fundamental reform of production line, workshop and enterprises, reshape production and operation, products and services, organizational process and other business scenarios, create industrial innovation forms, and promote the steady growth of industrial output value and employment.

1.3 Pictures



Case 2

The first pilot study of industrial visual positioning AR technology of China Southern Power Grid

2.1 Abstract

The first pilot study of industrial visual positioning AR technology of China Southern Power Grid. China Southern Power Grid Super High Pressure Co. builds an intelligent converter station. Through AR technology, the duty member of the converter station will know the location and operation progress in real time through the first perspective of the site work of the inspection personnel.

In the later stage, the AR environment map of the converter station is constructed, related equipment operation and maintenance information, superimposed external environment information (such as fire, typhoon, etc.). The inspection personnel can realize remote guidance, training and emergency drill of field operation through AR glasses and voice and gesture recognition. Top AI technology enterprises in the United Nations spent 5 days to complete the dynamic information collection of two flow stations. Visual positioning identification accuracy reached 5 cm, the highest level in China.

2.2 Analysis

The operation state of power equipment and the quality of power supply are crucial related. In order to ensure the stable supply of power and improve the use efficiency of power resources, it is very necessary to overhaul the state of power equipment. According to the statistics of the American Power Research Institute and the Construction Code Association, the implementation of state maintenance in the power grid system can improve the equipment utilization rate by 2%~10%, save the maintenance cost of 25%~30%, and extend the equipment service life by 10%~15%. As an important data source to judge the health of equipment, professional inspection plays a key role in the maintenance of power equipment.

Traditional manual inspection has problems such as large labor cost, low work efficiency, inadequate inspection, and forged inspection data or imperfect data statistics, leading to the failure to find equipment faults in time and affecting the stable supply of power. The application of AR technology in inspection work realizes automatic navigation of inspection route, equipment fault or risk warning alarm, and can view the equipment status data in real time, query historical data in time, help enterprises realize intelligent power inspection and effectively improve the quality of inspection, so as to avoid the inspection not in place or timely.

2.3 Pictures



Case 3

Huawei helps in the operation of Tianjin Port 5G port business performance evaluation and monitoring system

3.1 Abstract

On August 10, Huawei officially released that the company has cooperated with Tianjin Mobile to successfully completed the commercial use of Tianjin Port Bridge and low delayed 5G network remote operation business, and realized the operation of the 5G port business performance evaluation and monitoring system for the first time in the industry, in order to promote the construction of "5G Smart Port" in Tianjin Port.

At present, tianjin mobile through Huawei 5G end-to-end solution, in tianjin port 5G network coverage, based on end-to-end 5G SA independent network and MEC sinking deployment, tianjin port remote bridge machine control not only replaced the traditional fiber transmission mode, but also delay to milliseconds, the driver can through remote control system and panoramic HD camera back real-time images in control indoor real-time control terminal container transfer operation.

On this basis, Huawei and Tianjin Mobile have introduced an online real-time evaluation and monitoring system for 5G port video and control business performance in Tianjin Port, changing the lack of system management in the past. Through business simulation and online long-term test data, it will facilitate simplifying the operation and maintenance process, improve the operation and maintenance efficiency, and help the intelligent management of 5G ports.

3.2 Analysis

Infrastructure construction is the base of economic development, represented by "iron based" "old infrastructure" supports the rapid development of China for forty years, achieved China's economic miracle, compared with "old infrastructure", with 5G, Internet of things, artificial intelligence and other emerging technologies represented as "new infrastructure" will inject new momentum into the development of our real economy, support the next forty decades of economic development of strategic goals.

Take the 5G port in the case as an example, and the port, as the junction point of sea and land transport, plays an important linkage role in the regional economic development. At present, global ports are facing the problems of rising labor cost, large labor intensity, bad working environment and manpower shortage. As a new growth point of regional economy, automatic transformation can reduce cost and increase efficiency has become the common demand of global ports. 5G as information infrastructure, it has low delay, large bandwidth, high reliable characteristics for wisdom port construction gives new kinetic energy, power port operation intelligent, logistics service electricity, enterprise management platform, improve port operation efficiency, promote the sustainable development of port business, thus drive the high quality growth of hinterland economy.

3.3 Pictures





Goal 10: reduced inequalities

- » Case 1. AI in the COVID-19 world
- » Case 2. Artificial intelligence helps intelligent elderly care
- » Case 3. Changmugu AI Orthopaedic intelligent team expansion

Case 1

AI in the COVID-19 world

1.1 Abstract

Today, amid the COVID-19 pandemic, four billion people still cannot access the health services they deserve. The development of AI technology will surely bring about more equitable solutions. Microsoft launched the first industry cloud solution "Microsoft Medical Cloud" (Microsoft Cloud for Healthcare) —, based on Microsoft's existing cloud services related to health industry needs and scenarios, can meet the main needs of the medical industry, including improving patient communication, strengthen medical team collaboration, improve operation and treatment data insight, and ensure interoperability, security and credibility of cloud computing.

1.2 Analysis

The problem of difficult and expensive medical treatment is very prominent in China, mainly manifested in two aspects. One is the uneven distribution of medical resources. According to statistics, tertiary hospitals have nearly 90% of high-tech equipment and excellent medical personnel in the current medical service system. Serious insufficient medical equipment, low doctor density limit limited treatment ability and often need to be referred to large hospitals for subsequent diagnosis and treatment or conservative treatment; Second, primary hospitals are crowded, but tertiary hospitals and clinics are overcrowded every day, and the low proportion makes doctors under high pressure and disputes. In addition, combined with the sudden COVID-19 outbreak, the peak pressure of the "wartime" medical system cannot be met by relying on the traditional medical mode.

In the face of the above situation, through the supply-side reform, in addition to increasing the supply of medical resources, the use of AI technology to improve the use efficiency of medical resources is one of the effective ways to quickly alleviate the current shortage of medical resources:

First, through the AI algorithm to assist doctor diagnosis and treatment, can greatly reduce the burden on doctors, release the energy and time to handle more urgent events, diagnose and treat more patients, do more focused communication with patients, while reducing the pressure of the medical system is conducive to the benign development of doctor-patient relationship.

Second, the AI algorithm implements the expert experience and knowledge map digital, standardization, can copy and output, increase the overall supply of medical resources, quickly improve the medical level of grassroots hospitals, make patients in developed or remote areas, can be nearby, enjoy the basic homogeneous medical services, promote the balanced development of medical and health resources.

The application and promotion of artificial intelligence in the medical field is the concrete embodiment of SenseTime's AI ethical principles, and is also in line with the UN advocated Sustainable Development Goals (SDG 10 and SDG 3) — to reduce the regional gap and human inequality caused by insufficient resources and uneven distribution, to ensure that everyone has the power to pursue a healthy and happy life.

1.3 Pictures



Case 2

Artificial intelligence helps intelligent elderly care

2.1 Abstract

Artificial intelligence technology can help home care in at least in the following aspects: First, to promote "smart health" with big data, For example, the elderly's blood pressure and other data can be transmitted to the "cloud", And also put its past medical records on the "cloud", Doctors can provide health advice to the elderly through the Internet; Second, the production of "intelligent care" and other service robots, Can assist the elderly to do some simple housework, Observe whether the old man has any abnormal situation, And equipped with a reminder function; Third, to produce more and more advanced wearables, For example, blood glucose meters that can realize real-time monitoring, electronic neurons, equipment that can help paralyzed elderly people drive wheelchairs and so on; Fourth, think more about the difficulties and needs of the elderly when designing a smart home, Improve the quality of life of the elderly with more detailed creativity.

2.2 Analysis

As human life increases and the birth rate decreases, aging has become a worldwide problem. As a vulnerable group in the society, the elderly need relatively high survival attention due to their relatively weak independent ability, relative lack of power resources, and relatively marginalized social status. The United Nations stressed that enhancing the empowerment of older people in developing all aspects, including promoting their active participation in social, economic and political life, is a way to ensure inclusion and reduce inequality.

China is one of the countries with a high aging population in the world, with the largest number of elderly people and the fastest aging rate. Published by the World Bank in 2018. A report predicts that by 2027, the proportion of Chinese people aged 65 and above will rise from 7% to 14% in

2002, entering a deeply aging society. Rapid aging and demographic and social or structural changes could themselves exacerbate elderly inequality, thereby limiting economic growth and weakening social cohesion, becoming the most significant challenge for future sustainable development. As President Xi Jinping has stressed, "To meet the diverse needs of a large number of elderly people and properly solve the social problems caused by the aging population concerns the overall development of the country and the well-being of the people. We need to make great efforts to deal with them."

AI pension by changing the way of information communication, strengthen resource allocation integration, improve the efficiency of service management provides new problem solving, promote the health pension service quality and efficiency level, become the industry development direction and inevitable trend, also provides a more humanized, efficient pension way, meet the personalized needs of different elderly, make old life more healthy, happiness, warm and dignity.

2.3 Pictures



Case 3

Changmu gu AI orthopedic intelligent team expansion

3.1 Abstract

In the process of expanding AI orthopedic intelligence, Beijing long wood valley medical technology co., LTD. (hereinafter referred to as the "long wood valley") has signed dozens of leading level of orthopedic center in China, in order to expand long wood valley AI orthopedic intelligent research project team, create, share new technology, promote innovative technology landing, recently, long wood valley and six large joint, including Peking University people's hospital center signing cooperation, leading intelligent orthopedic change, power AI orthopedic intelligence.

It is understood that a new "medical black technology" — artificial intelligence auxiliary preoperative design AI K N E E system was recently introduced in AI orthopaedic intelligent research project one of the cooperation orthopedic center, the system adopts the world's first three-dimensional segmentation and anatomical identification neural network artificial intelligence algorithm, can provide comparable to "beidou" navigation accurate surgical planning and guidance. Doctors only need to input the patient's CT scan data into the system, and the system can automatically perform 3 D reconstruction and accurate segmentation. Not only can generate the three-dimensional image of the knee joint, but also can automatically match the appropriate joint prosthesis model, planning the best position and Angle, eventually generate interactive planning report and simulated operation results, let the doctor to the location of the operation, Angle at a glance, greatly improve the clinical efficiency, solve the customer surgery full knee replacement surgery problems.

3.2 Analysis

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First, through the AI algorithm to assist doctor diagnosis and treatment, can greatly reduce the burden on doctors, release the energy and time to handle more urgent events, diagnose and treat more patients, do more focused communication with patients, while reducing the pressure of the medical system is conducive to the benign development of doctor-patient relationship.

Second, the A I algorithm implements the expert experience and knowledge map digital, standardization, can copy and output, increase the overall supply of medical resources, quickly improve the medical level of grassroots hospitals, make patients in developed or remote areas, can be nearby, enjoy the basic homogeneous medical services, promote the balanced development of medical and health resources.

The application and promotion of artificial intelligence in the medical field is the concrete embodiment of SenseTime's A I ethical principles, and is also in line with the UN advocated Sustainable Development Goals (S D G 10 and S D G 3) — to reduce the regional gap and human inequality caused by insufficient resources and uneven distribution, to ensure that everyone has the power to pursue a healthy and happy life.

3.3 Pictures



Figure: The "AI HIP system" independently developed by Changmu Valley



Goal 11: Sustainable cities and communities

- » Case 1. Shenzhen transportation and meteorology realize intelligent upgrading with artificial intelligence
- » Case 2. AI crack the flood situation "password" flood control and flood protection home
- » Case 3. AI "on the road", the road is blocked and long! AI intelligent transportation has deeply changed the way of travel
- » Case 4. Landscape type super cool intelligent garbage station bid farewell to "dirty and messy"
- » Case 5. "Green Orange Intelligent Control Center" realizes the intelligent scheduling and operation of shared bikes
- » Case 6. Guangdong another network red park fire, super intelligent park, known as the local "entertainment light"

Case 1

Shenzhen transportation and meteorology use artificial intelligence to achieve intelligent upgrading

1.1 Abstract

Xu Wei, director of the traffic police department of the Shenzhen Municipal Public Security Bureau, said that the Shenzhen traffic police are fully applying artificial intelligence and 5G technology to traffic law enforcement, congestion control, command and other aspects. Shenzhen traffic police and Huawei Cloud have launched the traffic light timing scheme based on AI, big data and other technologies, which has been deployed to about 200 intersections in the city. Preliminary results show that traffic capacity at peak intersections can be increased by about 10%. It plans to access the system of more than 2,000 intersections in Shenzhen in the next few years to comprehensively improve the capacity of the city's intersections.

"Since the 40th anniversary of the establishment of Shenzhen Special Economic Zone, transportation, along with the development of the city, gives my biggest experience is that the development of Shenzhen transportation cannot be separated from the progress of science and technology, especially from artificial intelligence in recent years." Xu Wei introduced that for ambulances, emergency rescue vehicles, fire trucks and other vehicles, with the help of artificial intelligence, at the critical moment of emergency rescue to ensure the green light to the destination.

In addition to Shenzhen traffic, Shenzhen Meteorological Bureau analyzed the movement of the reflected clouds in radar waves through AI technology, thus improving the accuracy of the short-weather weather forecast. Compared with the past, the time and interval is more accurate, the time has been forecast within 2 hours, the interval is expected to reach within 1 square kilometer, and the accuracy has reached a high level.

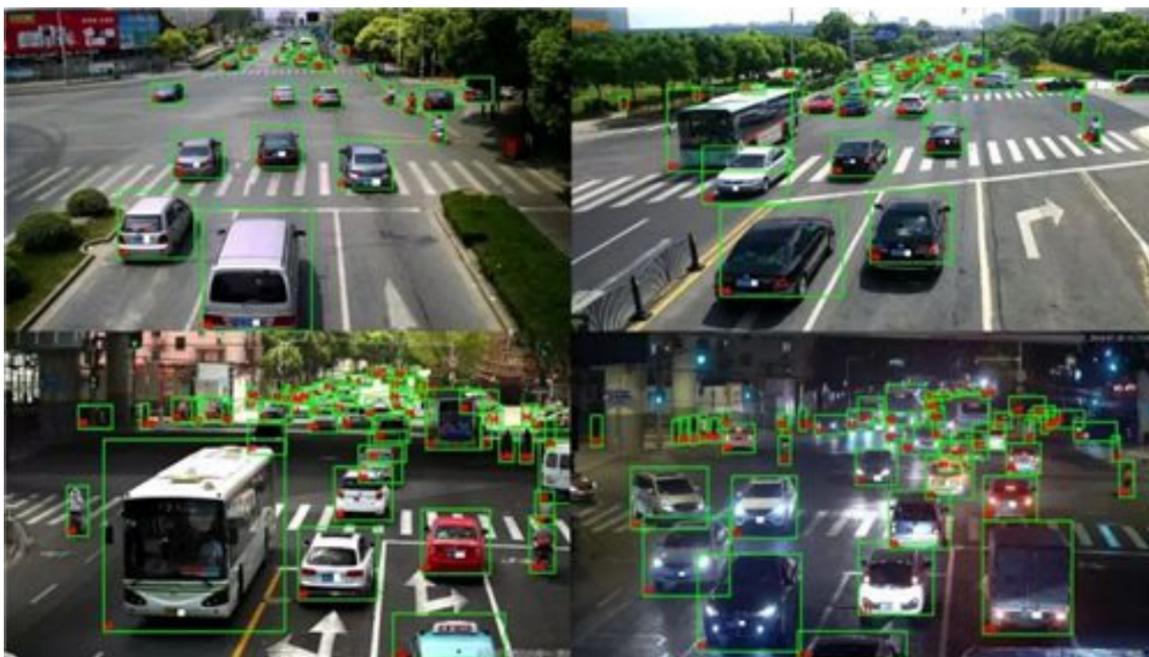
During this year's epidemic, the modeling of AI technology can predict the spread of the epidemic; in epidemic prevention and control, the close contacts are tracked through artificial intelligence and big data to block the transmission path of the epidemic; and AI robots realize no-contact temperature measurement, distribution, etc.

1.2 Analysis

According to United Nations statistics, only 30 percent of the urban population was available worldwide in 1950, but by 2050 there will be over two-thirds of the global population, That means about 5 billion people live in cities. Rapid urbanization process will cause many problems such as insufficient land, space, infrastructure and natural resources. Nowadays, urban "inertia diseases" such as traffic congestion and environmental pollution have reduced the quality of life of citizens everywhere, and the heavy pressure caused by urban emergency systems such as the COVID-19 and the waterlogging are all difficult problems faced by urban governance.

The introduction of "smart cities" with artificial intelligence can effectively alleviate the above "diseases". Through technology integration, the "urban operating system" is driven to complete intelligent upgrading and transformation to improve system resilience and system adaptability, so as to improve resource utilization efficiency, optimize the level of urban management and service, and finally improve the quality of life of citizens and achieve the sustainable development goal of the city.

1.3 Pictures



Case 2

AI crack flood situation "password" flood control flood protection home

2.1 Abstract

On July 20, because the main stream of wangjiaba section beyond the guaranteed water level, the "huaihe river" wangjiaba flood discharge, funan wa flood storage area instantly into a Zeguo; on July 27, based on the weather forecast information, and hydrological department forecast, anhui jiangkou river Lianwei started flood discharge, chaohu "burden" 1 00 million cubic meters, ten thousand people safe transfer. AI remote sensing image interpretation has played an active role in it. Sensetime S e n s e R e m o t e remote sensing image intelligent interpretation solution, to quickly realize the self-integration of water body, construction, roads, green space, farmland and other land and material elements Dynamic extraction and analyze its location, area and change combined with GIS, to determine flood trend and assess disaster impact.

2.2 Analysis

As President Xi Jinping has said, fighting against natural disasters is an eternal subject of human survival and development. With the current level of science and technology, we have no way to prevent natural disasters, but through certain scientific and technological means, establish a correct and systematic disaster prevention and mitigation mechanism, enhance the system emergency ability, can effectively reduce the disaster caused by direct and indirect losses to human society, earn opportunities for human survival, also provide security for human living security.

From a macro perspective, disaster prevention and mitigation is also an important part of social governance. The above cases we see, today's flood control and flood fighting work, get a lot of digital and intelligent technology, make people in early warning, decision-making and scheduling execution, more scientific than before, more scientific and more accurate, greatly improve the grassroots flood control efficiency, change the past relying on human tactics passive flood control mode, to the digital intelligent emergency management mode.

2.3 Pictures

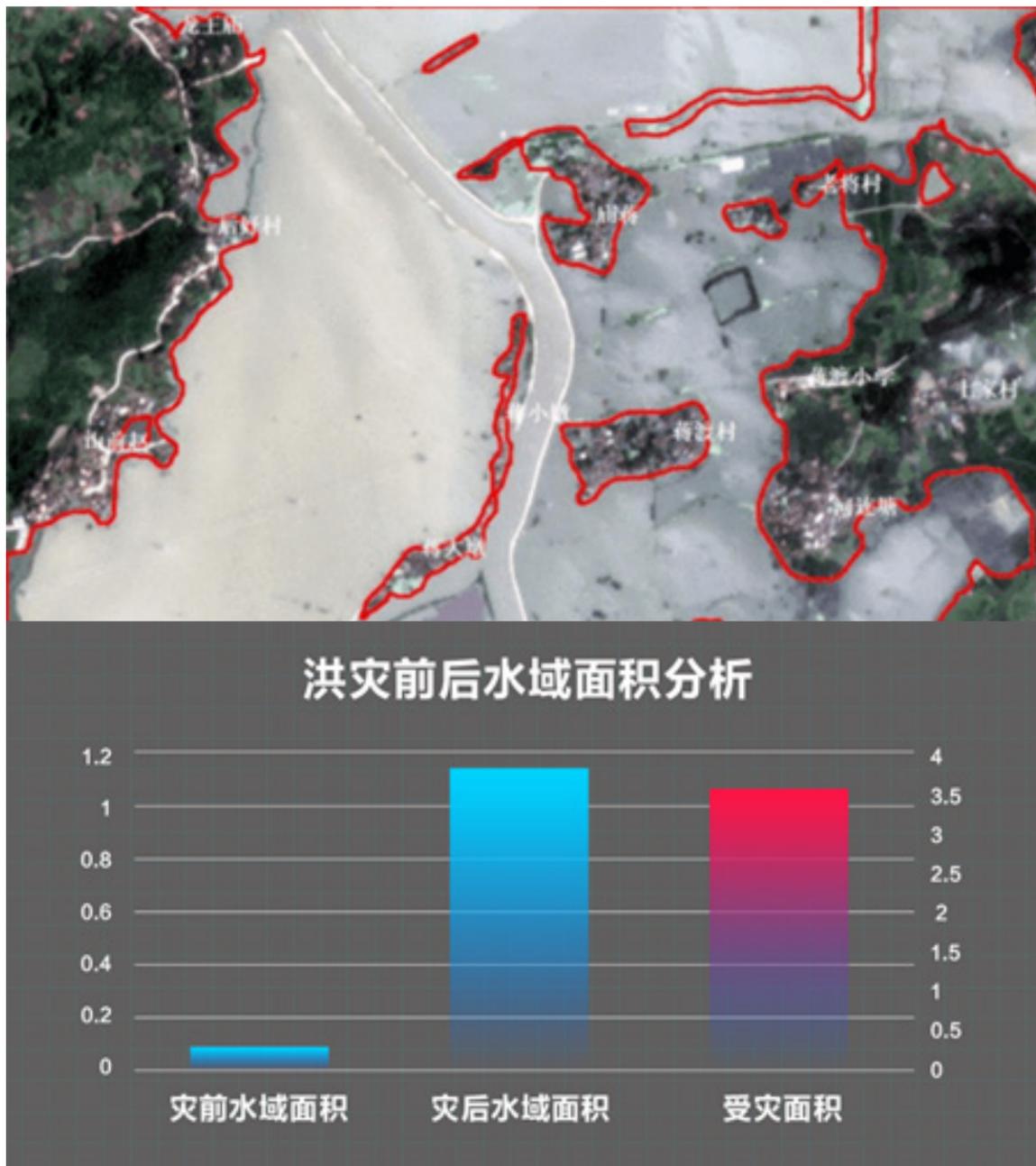


Figure: The change of Zhegao Town, Chaohu City, quantified the scope of water before and after July 25 of the flood on June 27, through SenseTime intelligent remote sensing interpretation technology. The analysis shows that before the flood, the water area in the south of Zhegao Town was 0.255 square kilometers. Affected to flooding, the water coverage in the area reached 3.71 Square kilometers, more than 3.46 square kilometers were flooded.

Case 3

AI "on the road", the road is blocked and long! AI intelligent transportation has deeply changed the way of travel

3.1 Abstract

With the development of society and the progress of urbanization level, urban transportation problems have become more and more prominent. "How to make transportation technology climb to a new level" has always become a hot spot at home and abroad, and the research on intelligent transportation tends to be obvious.

At present, the license plate recognition system is widely used at home and abroad. Its digital processing technology involves the head picture, transformed into digital signal, computer processing and other processes, which are reflected in AI technology. For example, when dealing with the head picture signal, the natural language processing used transforms the collected license plate information into the relevant digital signal to the computer. AI technology is the foundation of driverless technology, and driverless technology is also the basic guarantee of intelligent transportation; as the core of the two connection, the development of driverless technology depends on the development and application of artificial intelligence technology, and also affects the construction of intelligent transportation.

3.2 Analysis

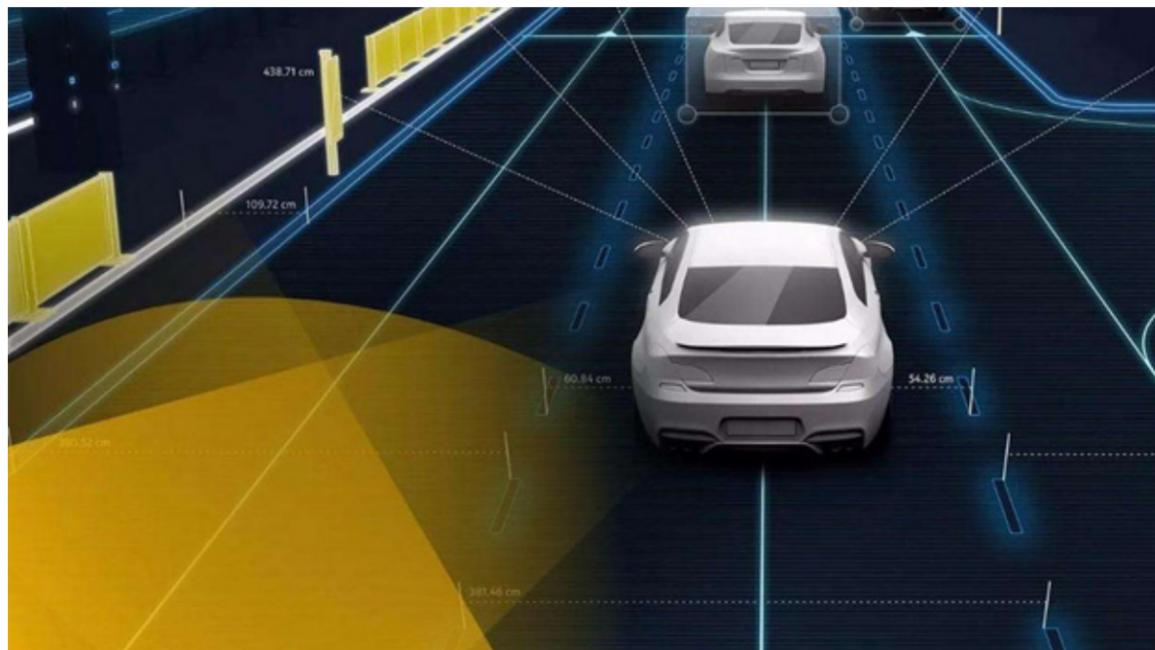
Transportation is an important means to connecting people, goods and services, and is an indispensable element of a city or community in its daily operation. We take various means of transportation such as car, bus and subway through different places in the city every day. The smooth operation of the traffic system directly affects the economic activities and production efficiency of the city, as well as affects people's quality of life and quality of life.

However, with the continuous expansion of the city scale, the population further gathers, which has brought more and more burden and pressure on the urban infrastructure, especially the road traffic. And 68% of the population is expected to live in the next decade

In cities, the size of single cities will exceed 50–80 million people, and the intensified contradiction between limited road resources and increasing travel demand will hinder the sustainable development of cities.

President Xi Jinping said, " If we have become more modern through big data, cloud computing and artificial intelligence to modernize urban governance, big cities can also become more 'smarter'. From informatization to intelligence to wisdom, it is the only way to build a smart city." Intelligent transportation provides effective solutions for sustainable urban development, especially the development based on AI technology driverless and car network, can greatly reduce car idle rate, more efficient use of road network, combined with sharing travel eliminate large parking lot, small charging pile replace gas station, release space for urban green, will upgrade " city park "to" city in the park ".

2.3 Pictures



Case 4

Landscape type super cool intelligent garbage station bid farewell to "dirty and messy"

4.1 Abstract

Intelligent garbage classification collection station using face recognition system, before community residents have downloaded the portrait information collection, was input portrait collection system, as long as go to the camera of the garbage cabinet, port will automatically open, after correct, points will "instant account", if put error, smart machine in addition to "drops", points will be deducted. On the far left of the bin, there is a neatly placed environmental protection bag, with 30 points, can be exchanged for biodegradable garbage bag.

At the same time, the intelligent garbage classification and collection station is equipped with an automatic weighing function, and the garbage weight will be automatically uploaded to the background service system. When the garbage accumulates to a certain amount, the intelligent garbage classification and collection station will send staff to clean up the garbage in the box in time.

4.2 Analysis

Garbage siege has become a global trend, and garbage is an appendage of urban development. The annual operation of cities and people produces hundreds of millions of tons of garbage, which has become a thorny problem in urban garbage disposal. Rapid developing Chinese cities are suffering from the pain of "garbage siege".

Garbage classification is recognized as one of the necessary means to alleviate the problem of "garbage siege". Adhering to doing a good job in garbage classification is not only an effective protection of the living and natural environment, but also an important measures to avoid waste of resources and reduce environmental pollution.

Although the community has been encouraging citizens to classify household garbage, and also introduced some corresponding incentives, propaganda work also did every household, urban residents quality is relatively high, should implement garbage will be easy, but in fact, the work is very slow, not to mention promotion effect in rural areas. The main reason for the analysis is that residents lack of garbage classification awareness and classification knowledge, and the current garbage classification supervision mainly relies on community human supervision. The supervision cost is high, so it is difficult to achieve comprehensive management during the whole time, and the "mandatory" of garbage classification is not obvious.

Using artificial intelligence and other technical means to help residents accurately release garbage, and cooperate with the physical incentive system, through the "award to promote governance" instead of human supervision, greatly reduce the cost of manual supervision, further improve the efficiency of garbage delivery, and help residents develop the habit of garbage classification.

4.3 Pictures



Case 5

The "Green Orange Intelligent Control Center" realizes the intelligent scheduling and operation of shared bikes

5.1 Abstract

On August 13, Didi's bike-sharing brand Qingju launched three new cars in Beijing, including changing the Angle, doubling the vehicle scheduling and maintenance efficiency, and Qingfan electric scooter and gazelle speed car. The green orange intelligent power changing cabinet, which solves the pain points of tram endurance, also made its debut at the media Open Day.

For the first time, Green Orange demonstrated its "Green Orange Intelligent Control Center" used for urban vehicle management. Relying on Didi's massive travel data and A I computing platform, the system has built the prediction ability of Qingju's short-distance travel needs in the city. Through Beidou +GPS dual-mode high-precision navigation and positioning, "fixed-point vehicle return and entry settlement" is realized, combined with the big data management platform of Qingju, intelligent scheduling operation and vehicle allocation are optimized.

5.2 Analysis

With the popularity of shared bikes, citizens' daily travel is more convenient. However, the disorderly management of bike-sharing has also brought some problems to urban governance, especially the problem of green occupation and road occupation. It not only wastes urban space and affects the appearance of the city, but also causes a burden for pedestrians, especially the disabled groups.

Green orange through A I computing platform and high-precision positioning navigation technology to realize vehicle intelligent scheduling, not only improve the Shared bike operation efficiency, meet the needs of users riding, also strengthen the management efficiency of sharing bikes, bring travel convenience for urban residents at the same time, also for pedestrians, disabled people create barrier-free travel space.

5.3 Pictures



Case 6

Guangdong another network red park fire, super intelligent park, known as the local "entertainment light"

6.1 Abstract

This park uses many new technologies, as well as high-tech such as Internet and video network. The football park here is intelligent. There are small football fields, which are very small but enough for people to play. There are also comprehensive recreation equipment, balance equipment and various exercise equipment.

This park is mainly for children's entertainment. Every week, children ask their parents to take themselves to play. This also has a lot of benefits. When children go out to exercise, they won't play mobile phones at home all the time, which is very good for their usual social interaction and eyesight. Among them, there are 7 different games in football field, and it is a modern intelligent football field. Not only can you play games here, but you can also learn a lot of useful knowledge and exercise your physical accuracy and strength.

6.2 Analysis

The expansion of urban public space indicates that the city once dominated by production function is transforming into a livable city dominated by culture, leisure and health care functions. This is just as Aristotle said: "People come to cities to live and stay in cities to live better." Urban public space is a place for people's daily communication activities, which is not only related to the image of the city, but also the needs of residents' life and urban development. This requires that in the stage of space design and construction, it is necessary to get rid of the tendency of "emphasizing decoration and neglecting function" and give full play to the role of public space as an organic part of urban function. In this case, by integrating artificial intelligence into the space, the interest of the space can be increased, so that residents can relax wholeheartedly in various service facilities provided by the public space.

5.3 Pictures





Goal 12: Responsible consumption and production

- » Case 1. Google Search feature
- » Case 2. Protera uses AI to build sustainable protein products

Case 1

Google search feature

1.1 Abstract

The Google search engine has evolved over time by studying the linguistics used in search. Its AI learns from the results and adapts over time to better meet the user's needs.

For example, a search for "What is the price of Chinese tea" could have Google highlight a "best answer" selection at the top, followed by a list of sources that could answer the question. The purpose of the Google algorithm is to provide the best results to the searcher. To do this, Google uses AI to try to determine the quality of the content and match it to the user's query.

1.2 Analysis

In the process of production and consumption, human beings spend most of their time dealing with information problems, including information search and processing. In the past decade, the Internet has greatly reduced the time cost of people in the process of information search, and anyone can search relevant information through the Internet platform at any place and at any time. The development of the Internet has also brought about an information explosion, in the face of massive, redundant and complex information search results, how to screen the "best answer" that meets the needs of users and make efficient use of information resources has become the key to effective production and consumption. Artificial intelligence improves the processing efficiency of massive information and assists enterprises and consumers to make better decisions quickly. At the same time, if the concept of circular economy such as environmental protection and energy saving is integrated into the information decision-making criteria, it can further promote the continuous improvement of sustainable production and consumption level.

1.3 Pictures

how much is the price of tea in china

About 171,000,000 results (0.55 seconds)

A cake of two-year-old Ye Sheng Gucha tea costs **260 yuan** (about £18), while the 13-year-old tea sells for **1,800 yuan**. "It'll double in price in two years," said Mrs Liu. Such returns are irresistible to a people in the grip of a speculating frenzy. Traditionally, the Chinese are savers, not spenders. Jun 24, 2007

Tea in China costs six times as much as gold - Telegraph
<https://www.telegraph.co.uk/news/.../Tea-in-China-costs-six-times-as-much-as-gold.html>

People also ask

- What's that have to do with the price of tea in China?
- How much does a cup of tea cost in China?
- How much is all the tea in China?
- How much does tea cost?

Tea in China costs six times as much as gold - Telegraph
<https://www.telegraph.co.uk/news/.../Tea-in-China-costs-six-times-as-much-as-gold.html>
 Jun 24, 2007 - A cake of two-year-old Ye Sheng Gucha tea costs **260 yuan** (about £18), while the 13-year-old tea sells for **1,800 yuan**. "It'll double in price in two years," said Mrs Liu. Such returns are irresistible to a people in the grip of a speculating frenzy. Traditionally, the Chinese are savers, not spenders.

What is the price of tea in China? - Quora
<https://www.quora.com/What-is-the-price-of-tea-in-China>
 Jun 15, 2015 - The best tea in China can be sold to **1000 dollars** per 500g.



Case 2

Protera uses AI to build sustainable protein products

2.1 Abstract

According to foreign media Fintech, Protera, headquartered in Santiago, Chile, recently received \$5.6 million in Series A financing, which was led by Sofinnova Partners and participated by SOSV. In addition, Joko Bobanovi, a partner of Sofinnova Partners, will join the board of directors of "Protera". In 2015, "Protera" was co-founded by CEO Leonardolvarez and COO Francia Navarrete. It's an artificial intelligence-driven startup, It aims to design and develop safe, sustainable and affordable protein food raw materials to provide a series of solutions to meet the challenges facing the world in terms of environment and consumer health.

It is known that one third of the food produced in the world every year is wasted. However, at present, the population is growing, and people's demand for nutritious food is also increasing. In addition, current industrial-scale food production technologies have long-term negative impacts on the environment. As a result, Protera has developed a unique production process called Natural Intelligence. The production of economical and environmentally friendly ingredients enables food and ingredient manufacturers to produce environmentally sustainable products without affecting food quality. Natural Intelligence uses its proprietary deep learning algorithm MADi to quickly predict and identify high-value protein products and enzymes that exist in nature. By use MADi, Protera can discover and make new protein components faster than ever before.

1.2 Analysis

The pollution of food production to the environment can not be underestimated. The process of food production is composed of many interrelated links. In this process, many food raw materials, such as starch, sugar, water and compounds, are consumed. At the same time, it will produce a large number of harmful substances and pollute the environment. The environmental pollution caused by food production mainly includes chemical substance pollution, biological pollution,

water pollution and air pollution. According to the analysis and investigation of a food processing plant, it can be found that there are many pollutants in food production, such as suspended solids, nitrates, methylindole and so on, which will cause certain pollution to the environment.

In the process of food production, it is necessary to minimize environmental pollution on the basis of ensuring food quality and safety, that is, to achieve safe production and green production, which are the two most basic requirements for food production. In this case, through the combination of artificial intelligence and machine learning technology, natural ingredients are selected instead of artificial synthesis. It can effectively reduce the pollution burden on the environment in the process of chemical synthesis of ingredients, and contribute to the sustainable development of the food industry.

2.3 Pictures





Goal 13: Climate Action

» Case 1: Microsoft's Zero Emission Roadmap Initiative for All Businesses

Case 1

Microsoft's Zero Emission Roadmap Initiative for All Businesses

1.1 Abstract

In July 2020, Microsoft joined forces with eight companies to develop a new initiative to accelerate the transition to a net-zero global economy. We recognize that a company alone cannot solve the global carbon challenge. Creating a multiplier effect on corporate climate change ambitions, The Transforming to Network Zero initiative aims to develop and provide research, guidance, and an implementable roadmap to enable all businesses to achieve net zero emissions. The initiative will be led by founding members including AP Moller-Maersk, Danone, Mercedes-Benz AG, Microsoft, Natura & Co, Nike, Starbucks, Unilever and the Environmental Defense Fund (EDF).

1.2 Analysis

Climate change is now a major cause of massive population displacement and has been identified by the United Nations as a "threat multiplier": a catalyst for social, political and international conflict.

The International Panel on Climate Change (IPCC) Special Report on Global Warming 1.5 °C 2018 argues that limiting global warming to 1.5 °C could "reduce the number of people at climate-related risk and vulnerable to poverty by as much as several hundred million by 2050". And to "reduce the challenging impacts on ecosystems, human health and well-being".

1.3 Pictures





Goal 14: life below water

» Artificial intelligence protects the Marine ecology

Case 1

Artificial intelligence protects marine ecology

1.1 Abstract

The IMT Atlantique research team is one of the winners of the "Artificial Intelligence Earth-EU Ocean Award", which is a funding award from the European Research Organization for projects related to the protection of the ocean. It will fund researchers to provide artificial intelligence tools and cloud computing resources to help them carry out their work. These are all part of Microsoft's AI Earth project, which has been launched since two years ago. The program has funded 236 projects. Professor Ronan Fablet and his research team at IMT Atlantique in France have been studying and predicting the impact of climate change on the ocean, and using satellite remote sensing data to model, analyze and reconstruct the dynamics of the ocean atmosphere, so as to better understand the potential impact of climate on the earth. And the impact of climate change on the oceans. Professor Ronan Fablet said: The data can help us understand the health of the oceans, including temperature and the level of sea level rise. But we still need technical support to get a lot of data and turn it into intelligent control. "Fundamentally, AI can accelerate our ability to study ocean dynamics."

The IMT Atlantique team uses the capabilities provided on Azure to build a 3D model of the ocean surface, and uses this model to test and validate new ideas to deepen the understanding of ocean surface changes. The information and theories gained through this project can help oceanographers and conservationists better protect our oceans.

1.2 Analysis

The world's oceans, with their temperature, chemistry, currents, and biology, drive the Earth system in which all of humanity lives. Our rain, drinking water, weather, climate, coastlines, much of our food, and even the oxygen in the air we breathe are ultimately provided and regulated by the ocean.

The climate crisis is fundamentally changing the ecological environment of the oceans and further affecting the global climate situation: the survival of ecosystems such as coral reefs will be threatened, phenomena such as ocean heat waves and hurricanes will become more frequent and severe, and sea level rise and extreme climate problems will force millions of people to be displaced. The United Nations Intergovernmental Panel on Climate Change (IPCC) issued a special report on the ocean and cryosphere in climate change, which issued a stern warning about the impact and status of climate change on the global ocean, and the urgency of protecting the global ocean was put on the agenda.

Obtaining global climate data through satellite remote sensing and using AI technology to process and analyze massive data efficiently will help researchers deepen their understanding of the impact of climate change on marine ecology and help people adopt more effective ways to protect marine ecology.

1.3 Pictures





Goal 15: life on land

- » Case 1. Planetary Computer: Promoting sustainable development with global data
- » Case 2. Forest fire prevention has entered a new era of artificial intelligence

Case 1

Planetary computers: Promoting sustainable development with global data

1.1 Abstract

If we think of the earth as a computer, a system with a constant flow of data that can be tracked, analyzed, and possibly predicted, what can we do with this computer? This is Microsoft's latest Planetary Computer initiative: Through the collection of aggregated global environmental data from multiple sources, machine learning and other technologies can be used to better understand the challenges facing human society. Lucas Joppa, Microsoft's chief environmental officer, demonstrated Microsoft's initiatives to promote the protection and maintenance of global biodiversity and ecosystems through a video at the World Artificial Intelligence Conference 2020 (WAIC 2020). It includes expanding the "AI for Earth" program, supporting the development of "planetary computers" to aggregate environmental data, and using artificial intelligence to develop and deploy technologies to promote sustainable decision-making.

1.2 Analysis

Land use/cover change, climate change, elevated atmospheric CO₂ concentration and nitrogen deposition caused by human activities have changed the characteristics, interspecific relationships, distribution patterns and biodiversity of biological organisms, thus affecting ecosystem processes and functions, and ultimately affecting human survival and sustainable socio-economic development. As can be seen, The factors affecting the earth's ecology are complex and interrelated.

By monitoring the global environment in real time, collecting and summarizing multi-dimensional data, and using artificial intelligence technology to analyze and process massive multi-modal data, it is helpful to establish the relationship between ecology and environmental change, so as to predict the impact of environmental change on biodiversity and ecosystems, thus providing

support for the protection of natural biodiversity. To find solutions for the healthy development of the earth's ecology. This is in line with the 14th and 15th goals advocated by the United Nations, using technological means to protect, restore and promote the sustainable use of marine and terrestrial ecosystems, so as to provide security for human survival.

1.3 Pictures



Figure: Cooperation project between Alxa SEE and Ant Forest

Case 2

Forest fire prevention enters a new era of artificial intelligence

2.1 Abstract

Enbo Technology Co., Ltd. and Huawei have reached a strategic partnership, combining the technological advantages of both sides, and put forward a leading forest prevention plan for the outstanding problems of the forest fire prevention industry. The scheme proposes to deploy software-defined cameras on the end side, Atlas on the side, and Huawei Yunkunpeng cloud service, and to deploy pyrotechnic recognition AI at different levels. It realizes the original video analysis on the end side, the primary analysis of the old equipment on the side side, and the secondary analysis and review on the cloud side. Compared with the traditional thermal imaging scheme, the forest prevention scheme has the advantages that the alarm accuracy is improved by geometric multiples, the cruise period is shortened to 3-10 minutes, and the fire under the forest and the fire under the slope can be found in time. Day or night, The scheme is significantly better than the thermal imaging scheme in terms of cruise cycle, warning timeliness and recognition accuracy.

The forest defense scheme breaks the traditional "sensor-like" technology model, and uses computing power, algorithms, forest fire data combined with computer vision and artificial intelligence algorithms to create a forest fire recognition engine. The engine can identify smoke in the daytime and fire at night, which can detect undergrowth fire and underslope fire as early as possible, and is suitable for detecting early fire in forest areas.

In addition, the engine automatically discriminates and filters interference factors such as clouds, fog and water droplets, independently "understands" complex and changeable forestry monitoring scenes, automatically distinguishes the sky, mountains, villages, lakes, roads, etc., effectively identifies abnormal weather such as fog and rain, and has adaptability to complex field scenes. It directly improves the accuracy of fireworks recognition from the dimension of shielding interference.

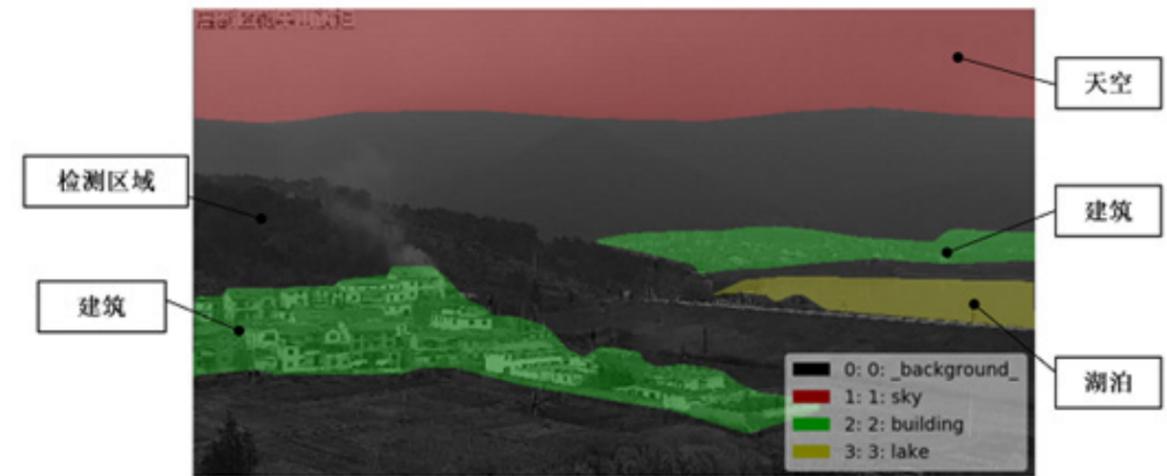
2.2 Analysis

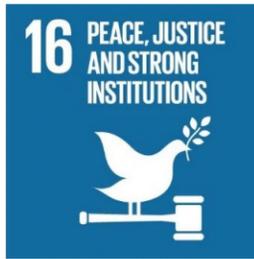
The survival and development of human beings can not be separated from the oxygen and forest products provided by forests. Although China has vast territory and abundant resources, the total amount of forest resources is still insufficient, and the forest coverage rate is only 60% of the world average, ranking 130th in the world. The per capita forest area is only 0.13 hectares, less than 1/4 of the world average, ranking 134th in the world.

Fire is one of the most important threats to forest resources, which can turn forests into ashes in an instant and cause great damage to forest resources and ecology. Because forest fires have the characteristics of "fast speed, strong suddenness and great destructiveness", fire prevention and disaster relief were extremely passive in the past, and a large number of firefighters had to be mobilized to fight each fire, which took a long time and was not effective. It is also very easy to cause casualties.

The rapid development of artificial intelligence technology has brought a new solution for forest fire protection. The use of computing power, algorithms, forest fire data combined with computer vision and artificial intelligence algorithms can identify the fire source at the first time, prevent forest fires from burning, and realize the transformation from human sea tactics to technical protection. In particular, the efficiency of protecting large areas of forest resources has been greatly improved.

2.3 Pictures





Goal 16: Peace, Justice and Strong Institutions

- » Case 1. The AI tool detects images of child abuse with 99% accuracy
- » Case 2. The country's first AI virtual judge to help the application of artificial intelligence in the judicial field

Case 1

The AI tool detects images of child abuse with 99% accuracy

1.1 Abstract

Safer, an AI-driven software, claims to detect images of child abuse with about 99% accuracy. The software was developed by Thorn, a non-profit, to help businesses without internal filtering systems detect and remove such images.

According to the UK Internet Watch Foundation, child abuse images spiked 50% during COVID-19. For 11 weeks starting March 23, its hotline recorded 44,809 images, compared with 29,698 in the same period last year. Most of these pictures are published by children, many of whom are forced to publish them.

One of Thorn's biggest users to date is the photo-sharing site Flickr. Flickr, using Safer, found an image of child abuse on its platform, and a law enforcement investigation led to the rescue of 21 abused children between the ages of 18 months and 14 years and the arrest of their abusers.

1.2 Analysis

In recent years, incidents of violence against children have occurred frequently. Every day around the globe, children live with physical, mental and sexual violence, abuse, neglect and abandonment. The World Health Organization estimates that about 40 million children under the age of 15 are abused and neglected worldwide. Child abuse has become a global problem. Studies have shown that, violence can affect children's physical and mental health, cause permanent damage to their learning and social abilities, affect their healthy development and increase the probability of intergenerational transmission of violence. The protection of children needs to be widely valued by all sectors of society.

There are a large number of pictures and videos of child abuse circulating on the Internet, and it is difficult to effectively and timely prevent violence against children through manual retrieval. Artificial intelligence has a natural advantage in processing massive image data, which can help the network platform to quickly carry out targeted image/video retrieval. It forms real-time linkage with government law enforcement agencies and child abuse prevention and control agencies to strangle violence at the first time and protect children from violence.

1.3 Pictures



Case 2

The country's first AI virtual judge to help the application of artificial intelligence in the judicial field

2.1 Abstract

Recently, the Beijing Internet Court Online Intelligent Litigation Service Center was launched, and the first AI virtual judge in China was released. This AI judge, built with the help of voice intelligent synthesis and image intelligent synthesis technology, can guide the parties to use the network litigation platform smoothly and realize the autonomy of the whole online operation. This is a model of the application of artificial intelligence in the judicial field of our country.

At present, the application of artificial intelligence in China's court system is mainly reflected in four aspects: intelligent assistant document processing, intelligent conversion of court transcripts, intelligent assistant case trial and intelligent assistant judicial service. For example, the Beijing court system is at the forefront of the country in the construction of intelligent courts. The "Rui Judge" system, which can realize the functions of automatic document generation, voice conversion, case search and prompt, has been installed. Specifically, the writing of judgment documents can be directly input by voice, the speeches of the parties in court can be automatically converted into court transcripts, and the case search can be easily carried out when writing documents. The trial system can automatically generate the template of judgment documents, and so on, which greatly alleviates the pressure of transactional work of front-line case handlers, is conducive to the unification of judgment standards, and reduces some simple and repetitive work. In terms of intelligent assistant judicial services, AI virtual prosecution judges developed by Beijing Internet Court can provide 24-hour online services. Online mediation, court sessions and electronic service technology using the Internet reflect the intelligent level of judicial services, save judicial human resources and facilitate parties in judicial proceedings.

2.2 Analysis

Our country is in a period of rapid growth of litigation. In 2018, 25.168 million cases were concluded and enforced by local people's courts at all levels, up 10.6% from the same period last year, while the number of post judges nationwide was more than 120000, and the number of post judges per capita exceeded 200. A large number of grass-roots judges are in a state of high load. Traditionally, in addition to holding court sessions to adjudicate cases, it also undertakes a lot of transactional work, such as litigation guidance, answering questions after judgment, law popularization, investigation and research. Therefore, as an artificial intelligence technology that can effectively reduce the routine work of judicial personnel, its application in the judicial field is very necessary.

In addition, the "7x24 hours" online judicial service provided by AI not only saves judicial human resources, but also expands the coverage of judicial services, so that more people can quickly and easily access justice, obtain legal help at a lower cost, and let everyone enjoy equal access to justice and rights. To improve the quality and effectiveness of justice, the application of artificial intelligence in the judicial field is of great value and significance in promoting judicial justice and enhancing judicial credibility.

2.3 Pictures





Goal 17: Partnerships for the goals

- » Case 1. Artificial intelligence helps cross-border circulation of import and export goods
- » Case 2. Fagard and other 15 countries have established the "AI Global Partnership Organization".

Case 1

Artificial intelligence helps cross-border circulation of import and export goods

1.1 Abstract

Automatic order making according to customer information, intelligent order dispatching according to employee preferences, robot process automation Artificial intelligence is enabling declaration enterprises to move towards the era of intelligent customs clearance. Customs clearance and declaration are mainly based on customs documents, and the traditional manual verification mode is inefficient. In recent years, the use of optical character recognition (OCR) for document recognition is an important scenario of customs business. However, there are many kinds of customs documents, many characters per page, complex layout, mixed arrangement of Chinese and English, and the business has been in dynamic change. The common OCR scheme can only achieve 80% recognition accuracy. With the development of business and the increase of complexity, the effect of the scheme also shows a continuous downward trend. At present, the intelligent customs clearance system has realized OCR optical recognition, AI artificial intelligence, RPA process automation, blockchain consensus, big data application, and sharing mode mechanism, using each link to collect effective data to generate customs declarations, and using the sharing concept to reduce repeated communication. At present, the correct rate of AI bill making can reach 96%. It can better replace the traditional manual voucher preparation and verification mode.

1.2 Analysis

Although Sino-US relations have had a certain impact on global economic and social cooperation, in the long run, the trend of globalization of the whole world has not ended, and strengthening global partnership and cooperation, opening up and win-win is still the central idea of future global economic, technological and cultural development.

As an important node of the global trade network, customs plays an important role in promoting regional economic and trade cooperation and trade liberalization as the supervision and management organ of the country's entry and exit. By adopting a series of technical means, including the intelligent customs clearance system mentioned in this case, we can improve the efficiency of customs work, realize trade facilitation, and reduce customs clearance costs and time. It is conducive to promoting regional economic exchanges and cooperation, serving small and medium-sized importers and exporters in developing countries, and strengthening sustainable development partnerships.

1.3 Pictures



Case 2

Fagard and other 15 countries have established the "AI Global Partnership Organization".

2.1 Abstract

The website of the French Ministry of Foreign Affairs reported on June 16 that international cooperation is important to make full use of artificial intelligence and to enable more citizens to enjoy artificial intelligence. With the convenience of artificial intelligence, Canada, France, Germany, Australia, the United States, Japan, South Korea and other 15 countries officially established the world's first "artificial intelligence".

Global Partner Organization. The organization will focus on the development of four areas, including the rational use of "artificial intelligence", data management, the impact on future employment, innovation and commercialization. Experts will also discuss the ways and potential contributions of "artificial intelligence" to cope with and overcome the novel coronavirus pandemic. The Secretariat of the organization will be located at the International Organization for Economic Cooperation, At the same time, two technology centers will be established in Paris and Montreal, and Canada will host the group in December 2020.

First Annual Meeting of the Organization. The establishment of this organization marks that Canada has become an important partner of France's digital diplomacy, and is also a substantial progress made by the two countries two years after the "Declaration on Artificial Intelligence" was put forward in June 2018.

2.2 Analysis

With the maturity of the deep learning algorithm represented by AlphaGo, the application of artificial intelligence technology has entered a stage of rapid development. As the leading force of

a new round of scientific and technological change, the subversive changes in human production and life in the next decade will be no less profound than the impact of the Industrial Revolution on the world a hundred years ago. The Industrial Revolution accelerated the cooperation and exchange of human beings in technology, culture, trade and other fields, and built today's mature global order and framework/system in cooperation and game, on the basis of which it promoted the development of trade liberalization, technological globalization and cultural pluralism.

However, in the coming period of new technological change, the old order and structure we built in the industrial age are constantly facing new challenges and cognitive breakthroughs, such as ethical issues and digital security caused by the application of artificial intelligence, as well as business changes led by artificial intelligence, which require all countries to work together to reach a new global consensus. Only on this basis can we promote a new round of sustainable development of the global economy.

2.3 Pictures



SenseTime's Committee of AI Ethics and Governance

SenseTime's Committee of AI Ethics and Governance (hereinafter referred to as AI Ethics Committee) was established to support the strategic development of the company in January 2020. The Committee mainly focuses on the high-level integration of the technical and social attributes of artificial intelligence, pays attention to and forecasts various potential social issues in the development of AI technology and products, and prevents and responds to potential ethical risks in the development of the company and the industry.

As the company's primary organization at the ethical level, the AI Ethics Committee is mainly responsible for AI ethics-related responsibilities, including principle formulation, concept publicity, and promoting the implementation of AI ethics measures, and determining SenseTime's goals, policies, work guidance and implementation measures concerning AI ethics. It also aims to facilitate the implementation of AI sustainable development strategies through AI ethics-related measures.



Expert Guidance



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