

"Robot+" application action implementation plan

At present, the robotics industry is booming and is greatly changing human production and Lifestyle, injecting strong momentum into economic and social development.

The 14th Five-Year Plan for National Economic and Social Development of the Republic of China and 2035 Years away

The overall deployment of the "Outline of the National Vision Goals" is implemented to implement the "14th Five-Year Plan" for the development of the robot industry

The key tasks of the "Plan" are to accelerate the expansion of robot applications and decide to carry out the "Robot

In order to ensure the orderly implementation of the action, this implementation plan is specially formulated.

case.

I. General requirements

(1) Guiding ideology

Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era,

Implement the spirit of the 20th CPC National Congress, fully, accurately and comprehensively implement the new development concept,

Quickly build a new development pattern, focus on promoting high-quality development, coordinate development and security,

Facing the people's yearning for a better life and the needs of economic and social digital development, we must

Maintain application traction, typical guidance, and basic support, and give full play to the departments, localities, and industries

With the help of multiple parties, we will focus on product innovation and scene promotion, and implement classified strategies to expand

Expand the depth and breadth of robot applications, cultivate robot development and application ecology, and increase

Strengthen the market competitiveness of independent brand robots and promote the independence of my country's robot industry

To accelerate the construction of a strong manufacturing country, a digital China, and promote Chinese-style modernization

Provide strong support.

(2) Main objectives

arrive2025In 2017, the robot density in manufacturing industry was2020Doubled in the past year,

The application depth and breadth of service robots and special robots in the industry have been significantly improved.

The ability of the people to promote high-quality economic and social development has been significantly enhanced.10Da Ying

Use key areas to make breakthroughs100More than 100 kinds of innovative application technologies and solutions for robots

Case, promotion200More than one with high technical level, innovative application mode and

Typical application scenarios of robots with outstanding application results, creating a group of "robot +"

Apply benchmark enterprises and build a number of application experience centers and test verification centers.

Mobilize various industries and regions to carry out

"Robot +" application innovation practice. Build international and domestic exchange platforms to form

A strong atmosphere for comprehensively promoting the application of robots.

2. Deepen the application of "Robot+" in key areas

Aiming at the needs of improving social livelihood and economic development, we will select those with a certain foundation and

Focus on key areas with wide application coverage and strong radiation driving effect, focusing on typical applications

scenarios and user needs, and carry out research and development of robot products, technological innovation,

Support the systematic promotion of scenario application to model promotion. Support the exploration of some emerging fields.

Explore the application of robots.

(1) Economic Development

1.manufacturing

Develop new robot products for welding, assembly, spraying, handling, grinding and polishing, etc.

Accelerate the application and expansion of robotic production equipment into related fields. Develop specialized,

Customized solutions and software and hardware products, accumulation of model libraries and process software packages

Experience and knowledge, deep integration of robot control software and integrated application systems,

The industry has formed a dynamic

Large-scale application industries, such as sanitary ware, ceramics, photovoltaics, smelting, casting, sheet metal

In the fields of gold, hardware, furniture, etc., glazing, blank repair, polishing, grinding, welding

Application in key links such as welding, spraying, handling, and palletizing. Promote intelligent manufacturing demonstration

Factory construction, creating typical application scenarios for industrial robots.

The robot's intelligent manufacturing system helps the manufacturing industry achieve digital transformation and intelligent transformation.

2.agriculture

Research and development of tillage, seed breeding, sowing, irrigation, plant protection, harvesting,

Robots for sorting, inspection, milking, and feeding of livestock, poultry, and aquaculture,

Robot production for cleaning, disinfection, disease prevention, environmental control, livestock product collection, etc.

Develop special control systems, autonomous intelligent mobile platforms and operating components, and promote

The robot adapts to farmland, agronomy and varieties to realize online information perception,

Fine production control, unmanned autonomous operation, and efficient operation and maintenance management.

Agricultural robots should be used in areas, fields, facility horticulture, animal husbandry and aquaculture, storage and transportation processing, etc.

Accelerate the intelligent transformation of agricultural, forestry, animal husbandry and fishery infrastructure and production equipment,

Promote the deep integration of robots with agricultural planting, breeding, forestry and fishery production,

Support the development of smart agriculture.

3.architecture

Research and measurement, material distribution, steel bar processing, concrete pouring, floor and wall

Robot products such as surface decoration and renovation, component installation and welding, and electromechanical installation.

Improve the robot's ability to adapt to special natural conditions such as high altitude, severe weather, and special geology

Construction and maintenance of underground infrastructure, as well as long mountain tunnels, ultra-long span bridges, deep water

Adaptability of robots in the construction and maintenance of large and complex infrastructure such as waterways.

Production of earth prefabricated components, cutting and welding of steel components, processing of partition boards and integrated kitchen and bathroom

and other building components production links, as well as building safety monitoring, security inspection,

Innovative applications in high-rise building cleaning and other operation and maintenance links. Promote the expansion of construction robots

Application space to help the coordinated development of intelligent construction and new building industrialization.

4.energy

Research and development of energy infrastructure construction, inspection, operation, maintenance, and emergency response

And other robot products. Promote enterprises to break through high altitude, narrow space, strong electromagnetic field, etc.

Key technologies for movement, perception, and operation in complex environments.

Electric field, photovoltaic power station, hydropower station, nuclear power station, oil and gas pipeline network, hub substation,

Energy infrastructure scenarios such as important converter stations, backbone power grids, and important transmission channels

Application. Promote the deep integration of robots and energy fields, and help build modern energy system.

5.Trade Logistics

Develop automatic guided vehicles, autonomous mobile robots, delivery robots, automatic

Palletizing machines, intelligent sorting machines, logistics drones and other products.5G,machine

Vision, navigation, sensing, motion control, machine learning, big data and other technologies are integrated

Support the intelligent transformation of traditional logistics facilities, improve warehousing, loading and unloading,

The work efficiency and management level of handling, sorting, packaging, distribution and other links.

Encourage robot companies to develop overall solutions for terminal delivery and promote robot delivery

Instant delivery scenarios with multi-modal linkage such as smart parcel boxes (smart express boxes)

Popularize and promote. Create a smart logistics system with robots as the focus to enhance trade

The level of logistics digitization.

(2) Social and people's livelihood areas

6.Healthcare

Development consulting services, surgery, auxiliary examinations, auxiliary rounds, critical care, Medical robots for first aid, life support, rehabilitation, testing and sampling, disinfection and cleaning, etc.

Products. Focusing on nervous system damage, post-injury brain cognitive dysfunction, paralysis assistance

To meet the needs of rehabilitation treatment such as walking, breakthroughs in brain-computer interaction and other technologies, and develop

Accelerate the application of robotics and medical artificial intelligence in basic medical care.

breakthroughs in basic theories, common key technologies, innovative applications, etc., to promote artificial

Intelligent auxiliary diagnosis system, robot5GRemote surgery, brain-computer interface assisted rehabilitation

Accelerate the application of new technologies and products such as rehabilitation systems. Promote the use of robots in hospital rehabilitation,

Telemedicine, health and epidemic prevention and other scenarios. Encourage hospitals with conditions and needs

Use robots to perform precise minimally invasive surgery and build standardized robotic surgery

The laboratory is responsible for researching the clinical application standards of surgical robots.

Pre-hospital management, in-hospital diagnosis and treatment, and post-hospital rehabilitation tracking in the overall course of disease service system

Applications help build smart medical care.

7.Elderly care services

Develop disability assistance, bathing assistance, defecation care, rehabilitation training, housework,

Accelerate the development of robot products that assist the elderly and the disabled, such as sensory care, entertainment and leisure, and security monitoring.

Promote multimodal quantitative evaluation, multi-information fusion emotion recognition, flexible and adaptive human

The application of new technologies such as computer-computer interaction and artificial intelligence assistance in the field of elderly care services,

Actively promote the use of exoskeleton robots, elderly care robots, etc. in elderly care service scenarios

Encourage relevant experimental bases in the field of elderly care to use robot applications as

Experimental demonstration of important content, research and development to promote science and technology to help old new technologies, new products and ne

Research and formulate application standards and specifications for robot-assisted elderly and disabled technologies, and promote the

Integrate people into different scenarios and key areas of elderly care services to improve the intelligence of elderly care services

level.

8.educate

Develop educational robot products and programming systems for interaction, teaching, and competition.

Build robot service platforms by category. Strengthen robot education and guidance, and improve

Robotics teaching content and practice environment in colleges and universities, for teaching, training, competitions, etc.

Develop more functions and supporting course content for scenarios. Strengthen the professional knowledge related to robotics engineering.

Industry construction, improve the level of experimental robot products and platforms, and strengthen standardized management.

Advance 5G, artificial intelligence, intelligent voice, machine vision, big data, digital

Integrate twin technology with robotics technology and actively cultivate robotic campus service

New service models and forms, deepening the role of robots in teaching and research, skills training, and school

Application scenarios such as park safety.

9.Business Community Services

Develop catering, delivery, welcoming, guiding, consulting, cleaning, transportation and other business

robots, as well as household robots such as cooking, cleaning, monitoring, and companionship,

Strong application scenario exploration and product form innovation to improve the interaction between smart hardware and users

level, enhance the value of robot services. Promote the development of robot technology and 5G, Cloud Computing

The integration of new technologies such as computing and intelligent sensing can realize autonomous navigation, automatic obstacle avoidance, and

Actively promote machine-computer interaction, voice and visual recognition, data analysis and other functions.

People are integrated into service scenarios such as hotels, restaurants, supermarkets, communities, and families to meet business needs.

to meet the needs of businesses and communities for upgrading consumption experience, and to enhance the intelligence of commercial and life services.

Level of wisdom.

10.Safety emergency and extreme environment applications

Research and develop mining, civil explosives, social security, emergency rescue, extreme environment and other fields

Domain robot products. Enhance robot stereo vision, outdoor navigation positioning, multi-dimensional

Information perception, disaster remote warning, robot authentication and control, etc., development machine

The robot is resistant to extreme cold, open flames, high temperature and high pressure, flammable and explosive materials, high altitude and low pressure,

Toxic, high humidity, waterlogging, high dust, radiation, large flow of people and other complex and non-

Adaptive technology for structured operating environments. Promote intelligent mining, disaster prevention,

Inspection and guard duty, underground rescue, intelligent cleaning, unmanned transportation, geological exploration,

Application in mining scenarios such as dangerous operations. Promote the production and storage of hazardous chemicals

Safety production scenarios such as on-site inspections of facilities, on-duty and special operations should be

Promote the charging, production, preparation, packaging, loading and unloading, and online testing of explosives

Promote security patrol, anti-smuggling security inspection, anti-terrorism and riot prevention,

Investigation and evidence collection, traffic and border control, public security control, special operations disposal, service management, etc.

Strengthen explosion prevention and disposal, fire inspection, engineering rescue, and marine safety

Offshore fishing, marine oil spill and hazardous chemical ship rescue, natural disaster rescue, safety

Production accident rescue, nuclear emergency safety rescue and other hazardous environment applications. Promote space,

Application in extreme environments such as underwater and deep underground.

3. Enhance the basic support capabilities for "Robot+" applications

(1) Building a collaborative innovation system for robot production and application

Encourage industry and users to jointly build innovation alliances and innovation centers in the field of robot applications

Innovation organization. Support user units to participate in high torque density servo motors, high dynamic

Research on core technologies of the robotics industry chain, such as motion planning and control, and human-computer interaction,

Deeply explore and release potential application needs, and jointly develop advanced and applicable robots

Product and system solutions. Carry out product design, technology development, process

"One-stop" application innovation covering the entire process of optimization, mass production and demonstration and promotion.

Encourage production and use to jointly participate in the special robot industry chain "unveiling the list" promotion activities, bring

Improve robot technology support services

Services, actively promote industry-finance docking, enterprise incubation, technology transfer and transformation, spare parts preparation

Parts service, technical after-sales service, etc.

(2) Build a "Robot+" application experience and test verification center

Relying on users, robot companies and system integration companies, we will build

Scenario-based application experience centers for industry, education, medical care, elderly care, etc., to enhance user experience

Experience, expand product consumption and promotion. Relying on users, robot companies and third parties

Public service agencies should build facilities for robot application technology standard testing and verification, quality control, etc.

The center will be a test and verification center for mass testing, innovation incubation and other capabilities, and increase the accumulation of application data.

Improve the safety, stability, reliability, and usability of robot products level.

(3) Accelerate the development and promotion of robot application standards

Relying on relevant standardization technical organizations, establish cross-industry robot standardization work

Cooperation mechanism, strengthen the coordination of standardization work in cross-industry application fields, and promote

Cross-industry standards mutual adoption. Carry out key industry robot application process and special

Algorithm models, integrated device interfaces, application data security, human-computer interaction security, etc.

Development and promotion of standards. Strengthen the robot specialization in accordance with the entry requirements of specific industries.

Research on special safety requirements and testing method standards for new robot products.

Standardization of technical specifications, modular design and manufacturing, application safety and reliability, etc.

Promote the development of basic safety standards, product standards,

Research and formulate relevant standards and regulations on robot ethics.

Strengthen the application and implementation of standards. Promote international cooperation on robot application standards.

(IV) Carry out industry and regional "Robot+" application innovation practices

Encourage industry authorities to combine application industry development planning, scientific and technological research and

Construction of key projects, carrying out innovation and application demonstration of robot products in various industries

Guide and support regions with conditions and needs to develop characteristic and advantageous industries.

Carry out the "Robot+" application action in the region.

Group, develop and open up mature, emerging and potential application scenarios of robots, and carry out collaborative

"Robot+" applications with active innovation, significant application results and high promotion value

Use innovative practices.

(V) Build a "Robot+" application supply and demand docking platform

Build a "Robot +" application supply and demand docking platform to carry out resource sharing,

Information exchange and complementary advantages of supply and demand matching activities. In mature application areas,

Select a group of benchmark enterprises and typical scenarios with outstanding application results and strong influence

We will strengthen the supply of high-end robot products and enhance the depth and breadth of robot applications.

In the field of emerging applications and potential demand, explore the use of methods such as "unveiling the list and appointing the leader"

Solicit robot application solutions to promote supply innovation by driving demand.

Promotion catalogue of key robot technologies and products, and promotion of online application demonstration samples

between.

4. Strengthening the organizational guarantee for "Robot+" applications

(1) Strengthening organizational leadership

Give full play to the role of the National Leading Group for Building a Strong Manufacturing Nation and establish a multi-departmental coordination

The working mechanism of cooperation between the central and local governments has been established, and a coordinated promotion team has been established, o

The field is established by the competent departments, industry organizations, backbone enterprises, research institutes and

A joint working group was formed by governments in key regions to strengthen the supervision of machinery in key industries.

Research on relevant regulations and ethics for human applications, and normalize the application of robots

Monitor and track, and promote the construction of a regulatory system that adapts to the characteristics of robot applications in various industries

Tie.

(2) Improving policy support

All relevant departments and localities will promote the application of robots as a scientific and technological innovation,

Industry planning, key directions of industrial policies, and overall coordination of policies, funds, and resources

Support and increase investment in innovative applications of robots.

Robot development and application departments jointly promote the transformation of innovative achievements of national science and technology plans,

Guide robot companies to increase R&D investment and strengthen intellectual property protection.

In conjunction with the robot development and application departments, timely conduct assessments of the impact of robots on employment.

Encourage central and state-owned enterprises to open up

Robot application scenarios, establish a fault-tolerant mechanism, and support enterprises' first purchase and first use.

(3) Deepen publicity and exchanges

All localities, relevant enterprises and industry organizations should track, summarize and evaluate

Apply new situations, new problems and new experiences in the process of action, summarize and promote demonstration

Promote effective practices that are powerful, replicable and popularizable, and publicize and apply typical experiences.

Relying on relevant conferences and exhibitions in various industries, strengthen the exchange and exhibition of robot application results

Guide relevant units to compile annual reports on "Robot+" applications and publish

New application case collection. Make full use of the multilateral and bilateral cooperation mechanisms to promote the development of

Robot products and solutions "go global" to achieve win-win cooperation.

(4) Strengthen talent training

Cultivate and introduce high-end R&D talents and standardization talents for robot applications, strengthen

International talent exchange, build leading talents and innovative teams. Encourage robotics companies,

User units cooperate with general colleges and universities, research institutes, vocational schools, etc.

Build a talent internship and training base, jointly develop talent training for robot application, and provide

More employment channels. Organize industry-specific robot application skills competitions to discover and

Cultivate more high-quality technical and skilled talents in robotics.