

The robot

1.The role of robots

”The role of robots Is a high-level integration of control theory, robotics, machinery and electronics, computers, materials and bionic product. In industry, medicine, agriculture, construction and even the military have important applications in such areas. Now, the international concept of robots has been gradually approaching the same. In general, people can accept the claim that the robot is controlled by its own power and ability to achieve the various functions of a machine. The United Nations Organization for Standardization adopted by the American Federation of Robotics to the robot under the definition: "a programmable and versatile, used to move materials, parts, tools, operating machines; or to perform different tasks have to change and Programmable action specialized systems.

2.Evaluation criteria

Capacity of evaluation criteria Robot capability evaluation criteria include: intelligence, refers to feelings and perceptions, including memory, calculation, comparison, identification, judging, decision-making, learning and logical reasoning, etc.; function, refers to flexibility, versatility or space occupied, etc.; physics can be means the power, speed, continuous operation capability, reliability, combined with nature, life and so on. Therefore, it can be said robot is a biological function of three-dimensional coordinates of the machine.

3.Composition of the robot

The composition of the robot Robots in general by the executing agency, drives, detection devices and control system, etc.. Implementing agency, the robot body, the buttocks generally use the space for open-chain linkages, the movement of which the Deputy (rotate or move the Deputy Vice-) often referred to as joints, and joints shall be the number of robots are usually a few degrees of freedom. According to joint configuration types and the different forms of movement coordinates, the robot implementing agencies can be divided into rectangular type, cylindrical coordinate type, polar coordinate type and other types of joint coordinate type. For

anthropomorphic considerations, often the relevant parts of the robot body are known as the base, waist, arm, wrist, hand (gripper or end effector) and the Ministry of walking (for mobile robot), etc. . Drive device is driven by movement of the body implementing agencies, in accordance with the directives issued by the signal control system, by means of dynamic components, the robot action is needed. It is the input signal, the output is the line, the amount of angular displacement. Drive robot is mainly used in electric drives, such as stepper motors, servo motors, etc. In addition, there is also hydraulic, pneumatic, etc. drives.



Detecting device is the role of real-time detection robot's movement and work of the required feedback to the control system, compared with the configuration information, the right to adjust the implementing agencies to ensure the robot's movements to meet the intended requirements. As a sensor detecting device can be divided into two categories: one is internal information sensors for detecting the internal situation in various parts of robots, such as the joint position, velocity, acceleration, etc., and the measured information as a feedback the signal sent to the controller, to form a closed-loop control. The other is external information sensors, used to obtain information about the operation of robots and other objects and external environment of information, so that the robot moves to adapt to changing circumstances, so that to achieve a higher level of automation, even the machine person has a certain "feel" to the intelligent development, such as visual, sound and other external sensors sense given object of work, information about the working environment, the use of such information constitutes a major feedback loop, which will greatly enhance the work of the robot accuracy. Control system in two ways. One is the centralized control,

that is, the robot's control by a microcomputer to complete. The other is decentralized (level)-type control, which uses multiple computers to share the control of robots, such as when using the upper and lower two computers together to complete the robot control, the host often used for system management, communication, kinematics and dynamics calculations, to send commands to the lower-level computer information; as a junior from the machine, the joints corresponding to a CPU, for interpolation and servo control processing operations to achieve a given movement, to the host feedback. According to the different operational mission requirements, the robot control mode can be divided into point to point control, continuous path control and force (torque) control.

4.History of Robots

Robot History 1920 Czechoslovakia writer Karel Capek in his • sci-fi novel "Rossum's Universal Robots company", according to Robota (Czech, intended to "labor, slave labor") and Robotnik (Polish, the original intent as "workers"), to create a "robot" is the word. World Expo 1939 in New York on display at the Westinghouse Electric Company manufactured home robot Elektro. It is controlled by a cable, you can walk, say 77 words, or even smoke, but still far from the real chores. But it give people a vision of domestic robots to become more specific. Asimov sci-fi masters 1942, the United States put forward the "Three Laws of Robotics." Although this is only the creation of science fiction, but later became the principle of academic research and development by default. • In 1948 Norbert Wiener published in "control theory" to explain the machine in the communication and control function and the nervous, sensory function of the common law, first proposed as the core of computer-automated factory. 1954, American George • Dwyer created the world's first programmable robot and registered patents. This mechanical hand in accordance with different programs in different jobs, so has the versatility and flexibility. 1956 Dartmouth meeting • Marvin Minsky has made his views on intelligent machines: Smart Machine "to create an abstract model of the surrounding environment, if you encounter problems, from abstract model to find a solution" . This definition affects the subsequent 30 years of intelligent robot research direction. Dwyer and the United States in 1959, inventor Joseph • Ingeborg joined hands to create the first

industrial robot. Subsequently, the establishment of the world's first a robot manufacturing plant - Unimation company. As Ingeborg R & D for industrial robots and publicity, he was known as the "father of industrial robots." AMF Inc. in 1962, the United States produced "VERSTRAN" (meaning universal handling), and Unimation produced Unimate as a truly commercial industrial robots, and exported to countries around the world, setting off a worldwide study of robots and robot the globe. 1962 -1,963 years the application of sensors to improve the operability of the robot. People try all kinds of sensors installed on the robot, including the 1961 Ernst used in tactile sensors, Tomovic and Boni 1962, the world's first "smart hand" on the use of pressure sensors, while the McCarthy in 1963, has begun to add visual sensor in robot system, and in 1965, helped MIT launched the world's first with a vision sensor that can identify and locate building blocks of the robotic system. 1965 Johns Hopkins University Applied Physics Laboratory • developed Beast robot. Beast has been through sonar systems, photoelectric tubes and other devices, the environmental correction own position. 60 mid-20th century, the U.S. Massachusetts Institute of Technology, Stanford University, University of Edinburgh, been set up in the robot lab. The United States with the rise of the second-generation sensors research, "there feel" of the robot, artificial intelligence and to work towards it. The world's first intelligent robot Shakey Stanford Research Institute in 1968, the United States announced that they successfully developed a robot Shakey. It is with a vision sensor, according to the instructions of people to discover and crawl the building blocks of a computer to control it, but there is a room so much. Shakey can be regarded as the world's first intelligent robot, beginning the prelude to the third generation of robot research and development. 1969, Ichiro Kato, Waseda University Laboratory developed the first robot to walk, walk. Ichiro Kato, the long-term commitment to research humanoid robot, known as "the father of humanoid robot." Japanese experts has been to develop humanoid robots and robot technology, known for entertainment, then go one step further hastened the development of Honda's ASIMO and Sony's QRIO. In 1973 the world's first robot and small computers to work together, they gave birth to the U.S. company Cincinnati Milacron robot T3. Unimation introduced in 1978, the U.S. general industrial

robot PUMA, which marks the industrial robot technology has reached full maturity. PUMA is still work in the factory in the forefront. 1984 Ingeborg pushed robot Helpmate, the robot can deliver meals to patients in the hospital and get drugs, to send e-mail. In the same year, he predicted: "I want robots to clean the floor, cooking, washing out to help me to check security." In 1998 Denmark introduced Lego Robot (Mind-storms) package, so get with the building-block robot manufacturing the same, relatively simple and can arbitrarily assembled, the robot started to enter the private world. In 1999 Sony introduced Aibo robot dog (AIBO), immediately sold out, and from entertainment robots become the robot forward one of the ways ordinary family. In 2002 the U.S. introduced the iRobot robotic vacuum cleaner Roomba, it can avoid obstacles, automatic design of the road route, but also in the power is insufficient, automatically towards charging seat. Roomba is the world's largest-selling and most commercial household robots. an authorized agent iRobot Corporation Beijing: Beijing Science and Technology Co., Ltd. Micro-Mesh, Tomohiro [http // www micronet net cn](http://www.micronet.net.cn). In June 2006, Microsoft launched the Microsoft Robotics Studio, robotics modular, unified platform, it became increasingly evident, Bill • Gates predicted that household robots will soon be sweeping the world

5.Robot category articles

Being born in science fiction, like, people are full of fantasy robot. Perhaps it is because the definition of fuzzy robots, which gave the people full of imagination and creative space. Domestic robots: to help people take care of life, to do simple household chores. Manipulator-type robot: Can automatic, repeatable programming, multi-functional, there are several degrees of freedom can be fixed or movement, for associated automation systems. Programmable Robot: According to the order and conditions of a pre-requirement in turn control the robot's mechanical movements. Teaching-playback robot: Adoption of the guidance or other means, the first robot moves the church, enter the work process, the robot will automatically repeat operations. NC robots: do not have to move the robot through the values, language, etc. for teaching the robot, the robot according to the information after teaching job.

Feel-controlled robot: the use of sensors to obtain information on control of robot action.



Adaptive control robot: able to adapt to changes in the environment, control their own actions. Learning control for robots: can "understand" the work experience, with a certain degree of learning function, and the "learning" experience for the work. Intelligent Robots: The artificial intelligence robot to determine its actions. China's environment, starting from the application of robotics experts, robots are divided into two categories, namely industrial robots and special robot. The so-called industrial robots for industrial areas of multi-joint or multi-DOF robot manipulators. In addition to the special robot is outside of industrial robots used for non-manufacturing and the service of mankind advanced robots, including: service robots, underwater robots, entertainment robots, military robots, agricultural robots, robot-based machinery. In the special robots, some branches have developed rapidly, there is a separate system for trends, such as service robots, underwater robots, military robots, micro-operation of robots. At present, the international robot scholars, starting from the application environment, the robot is also divided into two categories: manufacturing environment of industrial robots and the non-manufacturing environment, the service and humanoid robots, This classification is consistent with our The. Also known as unmanned aerial robot machines, in recent years, the family in the military robotics, unmanned aerial vehicles are the most active research activities, technological progress, the largest research and procurement of funds into the largest and most experienced in the field of combat. 80 years, the world is basically the development of unmanned aerial vehicles based on the main line of the United States to move forward, regardless of the technical level, the types and number of UAVs, the U.S. ranking first in the world.

6. Robot varieties articles

6.1 Unmanned aircraft

drones "Detachment" Unmanned Aerial Vehicle Throughout the history of UAV development can be said that modern warfare is to promote the UAV development. The impact of modern warfare UAV is also growing. The first and during World War II, despite the emergence and use of unmanned aerial vehicles, but because of low levels of technology, unmanned aerial vehicles does not play a significant role. The Korean War in the United States use of unmanned reconnaissance and attack aircraft, but in limited quantities. In the ensuing war in Vietnam, the Middle East war, UAVs have become an essential weapon systems. In the Gulf War, the war in Bosnia and Kosovo war, has become the main reconnaissance UAV types. French "Red Hawk" unmanned aerial vehicle U.S. Air Force suffered heavy losses during the Vietnam War, was shot down aircraft, 2500, killed more than 5,000 pilots, the U.S. domestic public outcry. To this end the Air Force increased use of the UAV. Such as "buffalo hunters" UAV mission over North Vietnam 2500 times, low altitude photographs, injury rate of only 4%. AQM-34Q-type 147 firebee UAV Flight 500 several times, to conduct electronic eavesdropping, radio interference, dispersal of metal chaff and for some people to open up access, and so the aircraft. High-altitude unmanned reconnaissance aircraft In the 1982 war in the Bekaa Valley, Israeli forces discovered through aerial reconnaissance.

During the Kosovo war, the United States, Germany, France and Britain dispatched a total of 6 different types of unmanned aerial vehicles, more than 200 planes, which are: U.S. Air Force's "Predator" (Predator), the Army's "Hunter" (Hunter) , and the Navy's "Pioneer" (Pioneer); German CL-289; France's "Red Falcon" (Crecerelles), "Hunter", and the United Kingdom's "Phoenix" (Phoenix) and other unmanned aerial vehicles. UAV in the Kosovo war, some of the major completed the following tasks: low-altitude reconnaissance and battlefield surveillance, electronic interference, victories assessment, targeting, weather data collection, distribution of leaflets, and rescue pilot, and so on. The Kosovo war has not only greatly increased the UAV's position in the war, but also aroused the attention of Governments on the UAV. U.S. Senate Armed Services

Committee requested that the military should be prepared to 10 years, a sufficient number of unmanned systems to low-altitude attack aircraft in one-third of UAVs; 15 years, one-third of ground combat vehicles unmanned systems should be in . This is not to use unmanned aircraft to replace the pilot and it was, but some people use them to add the capacity of the aircraft in order to high-risk tasks to minimize use of the pilot. UAV's development will accelerate the theory of modern warfare and unmanned warfare systems development.

6.2 Special features robot

special feature of the robot Machine Police The so-called military robots on the ground is used on the ground robot system, they are not only in times of peace can help police rule out bomb to complete the task should be to the security in wartime can be replaced by soldiers of mine, reconnaissance and attack a variety of tasks such as Today, the United States, Britain, Germany, France, Japan and other countries have developed various types of ground military robots. Britain's "trolley" robot In Western countries, terrorism has always been one to make the headache problem. The United Kingdom due to ethnic conflicts, suffering from the threat of explosives, so as early as 60 years on the successful development of EOD robot. British developed crawler-style "trolleys" and "super cart" EOD robot, has more than 50 countries and police agencies has sold more than 800 units. Recently, Britain has in turn trolley robot to be optimized, prairie dogs and bison have developed two kinds of remote control electric EOD robot, the British Royal Engineers in Bosnia-Herzegovina and Kosovo are using them to detect and deal with explosives. Prairie dogs weigh 35 kilograms, the mast is equipped with two cameras. Bison weighed about 210 kilograms and can carry 100 kg of load. Both use radio control system, remote control distance of about 1 km. "Prairie Dog" and "Maverick" and EOD robot In addition to a bomb planted by terrorists outside the war-torn countries in many of the world, and everywhere a variety of scattered unexploded munitions. For example, in Kuwait after the Gulf War as an ammunition depot could explode at any time. In the Iraq-Kuwait border over 10,000 square kilometer area, there are 16 countries manufacture of 25 million mines, 85 million rounds of ammunition, and the multinational forces dropped bombs and cluster

bombs mines of 25 million bullets, of which at least 20% No explosion. And now, even in many countries there is residual in the First World War and World War II unexploded bombs and landmines. Therefore, explosive ordnance disposal robot is a great demand. Wheeled robot with the Removal of Explosive Devices and tracked, and they are generally small size, steering a flexible, easy to work in a small space, the operator can be a few hundred meters to several kilometers away through radio or optical control of their activities. Robot cars general color CCD camera is equipped with multiple pairs of explosives used for observation; more than one degree of freedom manipulator, with its gripper or clamp may be explosives, fuses or detonators screwed down, and to transport explosives walking; car was also equipped with shotguns, using a laser pointer aimed at, it can be to the timing device and detonating explosive devices to destroy; some robot is equipped with high-pressure water gun, you can cut explosives. Germany's EOD robot In France, the Air Force, Army and Police Department have purchased Cybernetics developed TRS200 medium-sized companies EOD robot. DM's robots have been developed RM35 Paris Airport Authority selected. German peacekeepers in Bosnia and Herzegovina equipped Telerob team returned the company's MV4 series of robots. Developed by the Shenyang Institute of Automation of China's PXJ-2 robot has joined the ranks of security forces. U.S. Remotec's Andros series of robots were welcomed by national uniformed services, the White House and congressional buildings, police stations have to buy this robot. Before the presidential election in South Africa, the police bought a four Andros VIA robots, they are in the electoral process carried out in a total of 100 multiple tasks. Andros robot can be used for small-scale random explosive ordnance disposal, it is the U.S. Air Force aircraft and passenger cars for use only robots. After the Gulf War, the U.S. Navy has used such a robot in Saudi Arabia and Kuwait Air Force Base in clearing mines and unexploded ordnance. U.S. Air Force also sent five sets Andros robot to Kosovo, for the clean-up of explosives and sub-shells. Each active duty Air Force explosives disposal team and air rescue centers are equipped with a Andros VI. EOD robot developed in China EOD robot can not only rule out the bombs, reconnaissance sensors can also use it to monitor the activities of criminals. Surveillance personnel in the far right

criminals day and night to observe, listen to their conversation, do not expose themselves very well could be right. In early 1993, in the United States occurred in Waco estate lesson plans, in order to get the activities of the Puritans who, the FBI used two kinds of robots. One is Remotec's AndrosVA type and Andros MarkVIA-type robot, the other is developed by RST company STV robots. STV is a six remote control cars, using radio and cable communications. On board can be raised to a 45-meter bracket, the above three-dimensional with color camera, day-optic sight, night vision sights, binaural audio detectors, chemical detectors, satellite positioning systems, target tracking using The forward-looking infrared sensors. The car takes only one operator, remote control distance of 10 kilometers. During the operation, sent out three sets STV, the operator remote control robot moving to a place 548 meters away from the manor to stop, the car bracket raised the use of video cameras and infrared detectors to the window spying, FBI officials were observed around the screen back to the image sensor, the activities of the house can be seen clearly.

6.3 civil robot

Robot command

Third, civil robot Robot command In fact, people do not want to the robot is not a complete definition, since the robot from the date of the birth of people will continue to try to explain what a robot in the end. But with the rapid development of robot technology and information era, the robot covers the contents of the increasingly rich and constantly enrich the definition of robot and innovation. 1886, French writer Lier Ya When his novel "Future Eve" will look like a person's machine named "Andeluding" (android), It consists of four components: 1, Life system (balance, walking, talking, body swing, feeling, expression to regulate the movement, etc.); 2, modeling solution quality (freedom of movement joints can be covered by a metal body, a suit of armor); 3, artificial muscles (in the armor on the body, veins, and gender of the body of various forms); 4, artificial skin (containing color, mechanism, contour, hair, vision, dental, gripper, etc.). • 1920 Czech writer Karel Capek published a science fiction screenplay, "Rossum's Universal Robots." In the script, the Capek the Czech "Robota" wrote the "Robot", "Robota" meaning slave. Opera preview of the development of robots the tragic impact

on human society, causing widespread concern in everyone, be regarded as the origin of the word robot. In the drama, the robot according to its owner's commands work quietly, without feelings and emotions in order to dull the way hard labor. Later, Rosam the success of the company to make robots with feelings, resulting in the application of robotics sector is increasing rapidly. In factories and domestic work, the robot has become an indispensable member. Robots find selfishness and injustice of human beings, and finally rebelled, and the robot are very excellent physical and mental, so exterminate the human race. But the robot does not know how to make their own that they themselves will soon become extinct, so they started looking for human survivors, but to no avail. Finally, a pair of robot perception is better than other men and women love a robot. Then robots evolved for mankind, the world has revived the. Capek made a robot safety, perception and self-propagation problems. Scientific and technological progress is likely to spark a human do not want problems. Although only a science fiction world of imagination, but human society is likely to face this reality. In order to prevent harm to human robots, science fiction writer Isaac Asimov (Isaac Asimov) in 1940 proposed a "three principles of robotics": 1, the robot should not harm humans; 2, the robot should abide by the order of mankind, with the exception of the first violation of an order; 3, the robot should be able to protect themselves in conflict with the exception of the first phase. This is ethical given to the robot program. Robot academia has developed these three principles as guidelines for robots. In 1967, Japan held the first academic conference on the robot, the proposed two representative definition. First, Masahiro Mori and co-Tian Zhou Ping made: "The robot is a kind of mobility, individuality, intelligence, versatility, half-human half-machine, automatic nature of slave mentality, etc. 7 features flexible machine." From this definition, Masahiro Mori proposed the automatic nature of intelligence, individuality, half-human half-machine, job nature, universal, informative, flexible, limited, mobility features such as 10 to represent the robot image. The other is made by Kato Ichiro has the following three conditions for a machine called the Robot: 1, with the brain, hands, feet and other three elements of the individual; 2, with non-contact sensor (with eyes, ears to accept the distance information) and contact sensors; 3,

with a balanced feel and inherent sense of sensors. Etiquette Robot
This definition emphasizes the implications of humanoid robots
should be, that it work by hand, relying on foot to achieve movement,
from the brain to complete the unified command role. Non-contact
sensors and touch sensors is equivalent to people's facial features,
the robot can identify the external environment, while the balance of
perception and the inherent sense is the state of robot perception
itself indispensable to the sensor. Industrial robots are not described
here but the autonomous robot. Robot is defined as a wide variety of,
the reason is that it has a certain degree of ambiguity. Animals
generally have these elements, so to be understood as humanoid
robot machine at the same time, the robot can be broadly understood
as imitation animal machine. 1988 in France Espiau the robot is
defined as: "Robotics is the design of sensor information according
to pre-planning to achieve a good operating system, and thus the
system to use as a research object." 1987 International Organization
for Standardization of industrial robots are defined: "Industrial robot
is a kind of automatic control of the operation and mobility features,
to complete a variety of operating a programmable manipulator."
Chinese scientists on the robot is defined as: "robot is an automated
machine, the only difference is that this machine has some
similarities with human or biological intelligence capabilities, such
as perceptual capacity, planning capacity, motor ability and
collaboration capabilities, is a highly flexible automated machines. "
In research and development operation unknown and uncertain
environment, the process of the robot, people gradually come to
realize is the essence of robotics perception, decision-making, action
and interactive technology combination. As people of understanding
the nature of the intelligent robot technology deepening, robotics
technology has begun to stream to penetrate all areas of human
activity. With the application characteristics of these areas, people
have developed a wide variety of perceptions, decisions, actions and
ability to interact with a variety of intelligent robots and special
machines, such as mobile robots, micro robots, underwater robots,
medical equipment people, military robots, air space robots,
entertainment robots. Special environment for different tasks and the
adaptability of robotics and general automation equipment is also an
important distinction. These robots are far from their appearance out

of the first humanoid robot and industrial robot has a shape more in line with a variety of special requirements of different application areas, their features and greatly enhanced the degree of intelligence, so as to robots technology to open up a broader space for development. Song Jian, Chinese Academy of Engineering said: "Robotics progress and application of automatic control of the 20th century's most compelling achievement is the highest sense of the contemporary automation." Robot technology integrates multi-disciplinary development results represent the forefront of high-technology development, its application fields of human life is causing the growing awareness of the international community to re-role and influence of robot technology. China's environment, starting from the application of robotics experts, robots are divided into two categories, namely industrial robots and special robot. The so-called industrial robots for industrial areas of multi-joint or multi-DOF robot manipulators. In addition to the special robot is outside of industrial robots used for non-manufacturing and the service of mankind advanced robots, including: service robots, underwater robots, entertainment robots, military robots, agricultural robots, robot-based machinery. In the special robots, some branches have developed rapidly, there is a separate system for trends, such as service robots, underwater robots, military robots, micro-operation of robots. At present, the international robot scholars, starting from the application environment, the robot is also divided into two categories: manufacturing environment of industrial robots and the non-manufacturing environment, the service and humanoid robots, This classification is consistent with our The. Ancient Robot The emergence of the term robot and the world's first industrial robot in recent decades the advent of all things. However, people's fantasies and the pursuit of the robot was already 3,000 years of history. Mankind's desire to create a humanlike machine in order to complete the various tasks instead of human beings. Machine carriage Western Zhou Dynasty, China's craftsmen Yanshi developed a singing and dancing on the Lingren, which is the earliest recorded robots. Spring and Autumn Period, China's well-known carpenter Lu Ban, the machinery is also an inventor, according to "Mojing" record, he has been a manufacture of wooden bird that can fly in the air, "no less than three days," reflects our working people wisdom. 2nd century

BC, Alexander era of the ancient Greeks invented the most primitive robot — — automaton. It is based on water, air and vapor pressure as a driving force of the statue will move, it can open the door itself, but also can make use of steam to sing. 1800 years to the Han, is not only a great scientist Zhang Heng's seismograph was invented, and invented the meter inside drum cart. Meter where each row a drum truck, the car blockhead drum about every shot clock about ten-mile line. Later Han Dynasty Three Kingdoms period, Zhuge Liang, prime minister of Shu successfully created a "wooden ox", and with its delivery of rations to support the front of the war. 1662, Japan's Takeda Omi invention the use of clocks and watches automatic mechanical doll, and in Osaka, Dotonbori performances. In 1738, the French genius technician Jack • Day • W Dixon invented a machine duck, it will rattle called, will be swimming and drinking, but also eating and excretion. W Dixon's intention is to make bio-mechanization of the function to be carried out medical analysis. Write robot At the time of automatic doll, the most prominent to the number of Swiss watchmaker Jack • Road, Ross and his son Lee • Louis • Road, Ross. In 1773, they introduced the automatic writing straight doll, auto-playing dolls and so on, they create an automatic gears and clockwork doll is the use of principles which made. Some of them are holding a brush and color paintings, some holding a goose feather dipped in ink to write, structure, clever, clothing gorgeous, all the rage in Europe. At that time, technological constraints, these dolls is one meter tall giant toy. Now the earliest preserved robot Ruishi Nu Sa Dier History Museum of the girl doll, which was produced in two hundred years ago, the two hands 10 fingers can be pressing the keys while playing organ music, now playing on a regular basis for visitors to enjoy, demonstrating the wisdom of the ancients. The mid-19th century is divided into two schools of automatic doll, that is science fiction to send and mechanical production of camp, and each in literary arts and modern technology to find its own place. In 1831 Goethe published the "Faust", shaped man-made "and my appreciation of Cruise"; 1870, Hoffman published an automatic doll as the main character of the work, "Gebeiliya"; 1883 Collodi's " Pinocchio "have come; 1886" Future Eve "have come. In mechanical physical manufacturing, 1893, Moore created a "steam" and "steam" and rely on the steam-driven

legs walking along the circumference. Beginning of the 20th century, the robot research and development has been more and more people care and support, a number of application-oriented robots one after another, in 1927 the U.S. Westinghouse engineers temperature Beardsley produced the first robot "cable box", and held in New York World's Fair exhibit. It is an electric robot, equipped with a radio transmitter, you can answer some questions, but the robot can not move. In 1959 the first industrial robot (programmable, round coordinates) was born in the United States and open a new era of robot development.

6.4 modern robo

modern robot Modern robotics research began in the mid-20th century, its technical background, the development of computers and automation, as well as the development and utilization of atomic energy. Since 1946, the first since the advent of digital electronic computer, the computer has made remarkable progress, the high-speed, large capacity, low price direction. The urgent needs of mass production promoted the progress of automation technology, the result is one of the birth of CNC machine tools in 1952. Associated with the control of CNC machine tools, machinery and parts for robotics research has laid the foundation for the development. On the other hand, atomic energy laboratory harsh environmental requirements of certain operating equipment instead of people to deal with radioactive material. In the context of this demand, the United States Atomic Energy Commission's Argonne Institute in 1947 developed a remote control robot in 1948, has developed a mechanical master-slave manipulator. Riveting robot In 1954, the United States wearing a Wal-Mart first proposed the concept of industrial robots, and apply for a patent. The point is that the patent technology control the robot with servo joints, the use of staff teaching the robot to move the robot can achieve the recording and reproduction of movement. This is the so-called teaching-playback robot. Almost all existing robots using this control method. As the first practical model of robotic products (teaching-playback) was introduced in 1962, the United States AMF's "VERSTRAN" and UNIMATION company launched "UNIMATE". These industrial robots and CNC machine tool control method broadly similar, but the shape characteristics of different,

largely similar to the composition of people's hands and arms. In 1965, MIT's Roborts shows the first one with a vision sensor that can identify and locate a simple building blocks of the robotic system. Robot dog In 1967, Japan set up the study of artificial hand (now renamed the study of bionic body), the same year held the first robot of Japan's Academic Council. In the United States in 1970, convened the first session of the International Symposium on Industrial Robots. Since 1970, Robot rapid widespread popularity. In 1973, Cincinnati Milacron Inc. • Richard • Horn created the first by a small computer-controlled industrial robots, it is hydraulically driven, and can enhance payload up to 45 kilograms. By 1980, industrial machinery talent really popular in Japan, it said the year "robot first year." Subsequently, the industrial robots have been tremendous developments in Japan, Japan, and thus also won the "robot kingdom laudatory." Autonomous underwater vehicle With the computer technology and artificial intelligence technology, the rapid development of the robot in the functional and technical level has been greatly improved, mobile robots and robot technologies such as visual and tactile is a typical representative. As the development of these technologies to promote the concept of an extension of the robot. 80 years, will have the feeling, thinking, decision-making and motor ability of the system is called intelligent robots, which is a broad, meaning a broad concept. This concept has not only guided the research and application of robot technology, but also gives a broad and deep development of robot technology to a huge space, underwater robots, space robots, aerial robots, ground robots, micro robots, etc. robots for various purposes have been brought forth, and many dream become a reality. Robot technologies (such as sensor technology, intelligent technology, control technology, etc.) to various areas of proliferation and infiltration of the formation of a wide variety of new machines - robot-based machine. Current and the interaction and integration of information technology has produced a "software robot", "network robots" name, which also illustrates the robot has the innovation.

7.Human and robot

Human and robot As society continues to develop, more and more detail the division of labor all walks of life, especially in the modern big industry, some people have twisted a number of products per day

are only targeted at the same site on a nut, and some people the whole days to take an end of a thread, just like the movie "Modern Times", as demonstrated, people feel that they have been alienated in the various occupational diseases has the effect, so there is a strong wish to use a machine instead of their own work, so people have developed a robot, to replace the people to accomplish these monotonous, boring, or dangerous jobs. Since the advent of robots, so that part of the workers lost their jobs, so some people had a hostile robot. "Robots posts, people will be laid off." Not only in our country, even in some developed countries like the United States, it was also held this viewpoint. In fact, this worry is unnecessary, and any advanced machinery and equipment, will increase labor productivity and product quality, create more social wealth will inevitably provide more employment opportunities, which has been proved by the history of human production and development. The emergence of any new things are advantages and disadvantages, but advantages outweigh the disadvantages, and soon people get recognized. The emergence of such vehicles, which not only deprived of part of the rickshaw pullers, porters business, but also often a car accident, a threat to human life and property. Although people have seen the car of these abuses, but it is people's daily life has become an indispensable means of transport. A well-known British statesman for the issue on industrial robots made such a passage: "the number of robots in Japan ranks first in the world, while the unemployed population at least, the United Kingdom the number of robots in the developed world at least, while the unemployed population high", which is also from another angle, the robot will not get people's rice bowls. The United States is the birthplace of the robot, the robot has a capacity far less than Japan, where some of the reasons is that some workers did not welcome the U.S. robot, thus inhibiting the development of the robot. Japan robot is able to quickly become a big country for many reasons, but a very important one is that when Japanese labor shortage, the government and enterprises hope to develop robots, people are also welcome to use the robot. As the use of robots, Japan has also tasted the sweetness of its cars, electronics industry, the rapid rise, and soon to dominate world markets. From now on the trend of industrial development in the world to see the development of robot is the only

way one. No robots, people will become machines; With robots are still the masters. Lego RCX NXT robot RCX yes yes a programmable building blocks, namely, the classroom robot (Robot instruction) in the brain. It is as a whole with Lego blocks, motors, sensors and other structures to form the backbone of robotic systems, like the brain, like control, command and robot behavior. Use ROBOLAB software, people can create, build, programming a real robot, it sports, exercise, and even themselves to "think." RCX to upgrade! NXT Robot! The new assembly robot body full of sensors, it can sound and motion sensors to the appropriate response, but also for the light and tactile it more responsive. NXT robot system is the heart of a 32-bit micro-processor can be transmitted by PC or a Mac operating procedures. Optical sensor According to the sensor assists to help your robot to "see." It allows your robot to distinguish between light and dark skin, and determining the light intensity in a room, or light intensity of different colors. Sound Sensor Sound sensor enables robots to hear! Sound Sensor can measure the noise level of decibels (dB) and DBA (frequency of approximately 3-6 kHz where the human ear is most sensitive), and the recognition of sound patterns and identify tone differences. Touch sensor Touch sensor contacts and the release reaction of the robot to create a "feel" like never before! It can detect single or multiple button presses, and report back to the nxt. Ultrasonic Sensors Ultrasonic sensors "see" objects in place! Ultrasonic sensor is able to detect a target and measures, in the vicinity of inches or centimeters.

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