

I. INTRODUCTION

- I. Hundreds of years ago the human race, using simple tools, accomplished dangerous, unpleasant, and repetitive tasks. We then see humans discovering ways more lucrative and simpler ways of accomplishing tasks through the use of machines. Industrialization seized large machines used in factories in place of peasant workers. The machines could do the work of a person in less time and with better consistency. There are certain tasks robots could accomplish quickly and harmoniously such as assembling products, handling dangerous materials, inspecting parts, cutting and polishing.
- II. In today's world, machines have become a very important part of the economy. Nowadays businesses need a work force that is efficient in order to keep up with their competition. Installing robots is often a way business owners can be more competitive, because robots can do some things more efficiently than people. For example a robot can work around the clock every day without pay, never need a sick day, and are reliable. Robots have also become a very important part of the military in missions that a soldier could possibly lose his life partaking in.

II. BACKGROUND

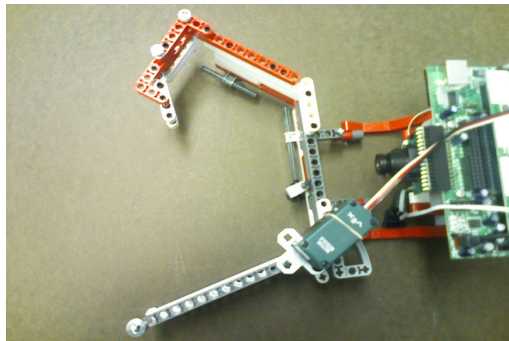
- I. A robot is defined as “a programmable, multi-functional manipulator designed to move materials, parts, or specialized devices through variable programmed motions for the performance of a variety of tasks”. There are several unique characteristics of a robot. A robot can be programmed to perform a particular task. In order for a robot to complete this task a human must intervene by thinking through the entire sequence of motions and operations, and then write a program that will allow the robot to carry out those motions. A robot can perform multiple tasks at a given time and continue doing this while moving on to another task.
- II. Robots are devices that imitate human manipulation. This means that a robot can be adjusted and remain flexible to meet a person's special need. Robots are built by people, programmed by people, and maintained by people; therefore, they are what people make them.

III. PARTS OF A ROBOT

- I. Control
 - I. A robot connects to a computer, which acts as a control of the controller.. A robot needs to be programmed and the program has be loaded with these programs onto the controller. The controller functions as the "brain" of the robot. The controller can also network to other systems, so that the robot may work together with other machines, processes, or robots.

II. Arms

- I. The robot arm comes in all shapes and sizes. Many (but not all) resemble human arms, and have shoulders, elbows, wrists, and fingers. There are many different ways and styles to a robot's arm. This arm gives the robot a multitude of positions for use in its environment and options for moving. In order to reach any possible point in space within reason, a robot needs a total of 6 degrees of freedom. Each direction a joint can go gives an arm 1 degree of freedom. So, a simple robot arm with 3 degrees of freedom could move in 3 ways: up and down, left and right, forward and backward. As a result, many robots of today are designed to move with at least 6 degrees of freedom. The jointed-arm robot has six degrees of freedom, which enable it to perform jobs that require versatility and dexterity.



III. Drives and Actuators

- I. The drive is the "engine" that drives the links (the sections between the joints) into their desired position. Most drives are powered by air (pneumatic control), water pressure (hydraulic control) and electricity. Most actuators use electromagnetic motors and gears but there have been frequent uses of other forms of actuation including "muscle-wires" and Radio Control servos. To get a motor under computer control, different motor and actuator types are used.

IV. Sensory Perception :-

- I. The sensor sends information as electronic signals back to the controller. Sensors also give the controller information about its surroundings and let it know the exact position of the arm and the state of the world around it. Sight, sound, touch, taste, and smell are the kinds of information we get from our world. Robots can be designed and programmed to get specific information that is beyond what our 5 senses can tell us. For instance, a robot sensor might see in the dark, detect tiny amounts of invisible radiation or measure movement that is too small or too fast for the human eye to perceive. The critical senses for robots are seeing and feeling, also known as vision and tactility in robotics jargon. Television cameras can be used to sense patterns of light and dark just as the human eye does, but the analysis of such data is extremely complex. Likewise, it is easy for robots to hear but difficult for them to understand. Voice recognition is already practical for limited voice commands.

IV. TYPES OF ROBOTS

I. Mobile Robots

- I. Majority of all mobile robots in use are Automated Guided Vehicle(AGV's). They are common in factory automation and usually consist of mobile platforms for transporting goods and materials within factories.

II. Manipulator robots

- I. Manipulator robots(robotic arms) in use, the jointed-arm robots, mimic the human arm capability. They have increased factory production as well as quality control.

III. "House" robots

- I. The small robots in our homes are mostly robots that can be built at home for several hundred dollars. A majority of the small robots are sold in construction kits which have the capability to run on the desktop. Now we are starting to see household cleaning robots called roomba's which can be disassembled and programmed to do almost anything.

IV. Entertainment robots

- I. The entertainment industry is seen as a potentially lucrative and large market for interactive robotic systems ranging from theme park venues to retail attractions and museum events. The robots that entertain us in the movies are remotely controlled devices using conventional servo and actuation technology, perhaps enhanced with some teach playback capability.

V. FUTURE OF ROBOTICS

- I. As of about ten years ago 9 out of 10 robots were being bought by auto companies, but now, robots are finding their way into warehouses, laboratories, energy plants, hospitals, even outer space. Robots are likely to become more significant in several industries and can be expected to enter smaller industries in the future. As robots become more common, and less expensive to make, they will continue to increase their numbers in the workforce. Naturally, this is a matter of concern for factory workers, who may see their positions filled by robotic systems. Robotics in future years could very well decide how life for humans will be like.

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