

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES IMPACT & INFLUENCE OF ROBOTICS & ARTIFICIAL INTELLIGENCE ON SOCIETY WITH MODERN WORKING TREND

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ABSTRACT

Robotics is well known term in our society nowadays. With Artificial Intelligence in trend, it is playing an important role in the development of society and making the life of individual easier day by day. The vision of the research project is to determine the impact of Robotics & Artificial Intelligence on our Society as well as on life style of man kind .

This Paper also gives an Quick Detailed over-view on Robotics and its basis components like Sensors, Effectors and Processor, Robotics and its type, Artificial Intelligence& its component, weak & Strong Artificial Intelligence, Applications And future extension of Robotics and Artificial Intelligence.

Keywords: *Artificial Intelligence, Robotics, Society, Weak & Strong Artificial Intelligence.*

I. INTRODUCTION

Artificial Intelligence comes to the idea of combination of machines with the computers to act or think in a humans way do. Over the years, machines and computers have performed various tasks and this process growing exponentially over time. Due to this growing interest in AI and Robotics there is push to increase the usage of robots and machine learning in medicine, manufacturing, military and household applicatons. An artificial neural network approach based parallel neural processing with a general mathematical framework. In Artificial Intelligence, “Fuzzy Mathematics” has its own important role.

Robots are basically machines, that are able to perform some specific task by the help of the computer program, which was inserted by the programmer as per need of the machine device or robot user. Robot functioning can be performed by either an external device (such as a remote control) or through a device that is implanted within the robot itself. George Devol first invented the digital & programmable robot in 1945 whose fu ction is to pick the hot piece of metal.

II. ARTIFICIAL INTELLIGENCE (AI)

The father of Artificial Intelligence is known as John McCarthy. The combination of science and engineering of making intelligent machines, is accepted as AI. The program for it is intelligent computer programs”.

”. Artificial Intelligence(AI) is a way of making machines and robots which were computer-controlled or software to be intelligent enough to learn, decide, and execute in a manner similar to the human kind, like in what way a human think and perform or acts. In short, aim of Artificial Intelligence is to create intelligence in machines. Artificial Intelligence is generally taken to be concerned, which was done by the applying computers tasks that require knowledge, perception, reasoning, understanding, and cognitive abilities.

Artificial Intelligence is routed on technology and science, and further in it on- Computer Science, Biology, Psychology, Mathematics, Linguistics, and Engineering. The major contortion of AI is in the development of

computer functions/ programming associated with human intelligence like- reasoning, learning, and problem solving. The AI method deputed the information receive by the, organize by the, and use efficiently by the people who understood it and also make correctin in its programming when needed.

III. COMPONENTS OF ARTIFICIAL INTELLIGENCE (AI)

An Artificial Intelligent computer system, should be able to perform operations like-reasoning, calculation, information storage, perception of relationships and analogies, learn from experience, and retrieval, problem-solving, natural language processing, classification, generalization, and adaptation.

Artificial Intelligence is composed of the following:

- Logical Reasoning :- Logical reasoning is a set of processes that enables us to provide a basis for judgment and making decisions and forecast. In Logical reasoning we uses minimum facts to reduce or solve the big /complex mathematical problem equations or proving theorems. There are two types of reasoning used, which include inductive reasoning and deductive reasoning. Inductive reasoning is based on specific observations which are suitably combined in order to reach a broad generalization. Deductive reasoning starts with the supposition or broad popularization and consider the possibilities to reach a logical conclusion.
- Problem-Solving :- Major roles of AI is problem-solving – in which games such as chess, tic-tac-toe, and poker are played using the heuristic knowledge-based rules stored in order to achieve the best possible gait given the largest number of possible moves.
- Natural Language Processing :- Natural language processing is the interaction with computers, translation from one written language to another, involving query retrieval, and text comprehension. Handwriting cognizance software reads the text written on paper, and then reckon the shapes of the letters and converts it into editable text. In speech recognition, machine systems (robo) are adequate of hearing/ listening and understanding the language and their meanings, while a human also talk in same way. It has the capability to recognize different accents, noises in the background, and any changes in the voice of human's (for example, changes in the voice due to a cold).
- Learning :- Learning is the procedure of acquiring explicit knowledge or new skills by studying, practicing, being taught, or experiencing something. Learning can be in the form of hearing, listening, remembering such as a sequence of events, watching, playing, identifying, writing, and systematize.
- Vision :- These systems explore and expound phenomenal penetration on the computer. Like in case of a medical diagnosis, doctors can use clinical expert systems to diagnose the patient using the digital image scans. Or in the case of a crime, police can use computer software that can recognize the face of a criminal with a sketch made according to the description given by the witness.
- Machine Learning :- It is the ability of the computer to learn without explicitly being programmed. Speech cognizance and image identity, these are some areas where machine learning is used.

IV. ROBOTICS

Robots are made up of hardware, which acts as an attorney to perform certain defined tasks by manipulation. Robots are dumbby themselves and have no built-in intelligence like humans. Robotics is the area that combines the hardware aspect of the Robot and Artificial Intelligence in making the Robot intelligent, making it capable of performing tasks without human support or supervision. However, Robots are directed in both supervised way and unsupervised manners. Robots can be in form of manipulators (used in manufacturing), mobile robots (such as the ones used to automate transport in production processes), and humanoid robots (which have resemblance of a human being).

Robotics is anxious with the affinity of perception to action. AI provides the sens by addressing what intelligence is required in the aspect of thought, representation of the knowledge, and how it is to be used, thus making Robots intelligent. Artificial Intelligence put to the imposingness of the components in a Robot (mechanical end effectors, various sensors, and computer programs) are to be used. Intelligent Robots are used in present-day manufacturing, assembly, cleaning, painting, and providing other services. A figure given below shows the components of a

Robot. In medicine, Robots are being used in neurosurgery and in cancer patients treatment. Robots are also used for household services, such as cleaning house, take care of baby, plants, house to be stolen, cooking food and too many. Japan, Robots are used to guide the blind. In enhancement humanoid Robots are being tested and weigh for deep space travel and disquisition by NASA.

V. COMPONENTS OF AN INTELLIGENT ROBOT

The below mention block diagram shows the various components of an intelligent Robot.

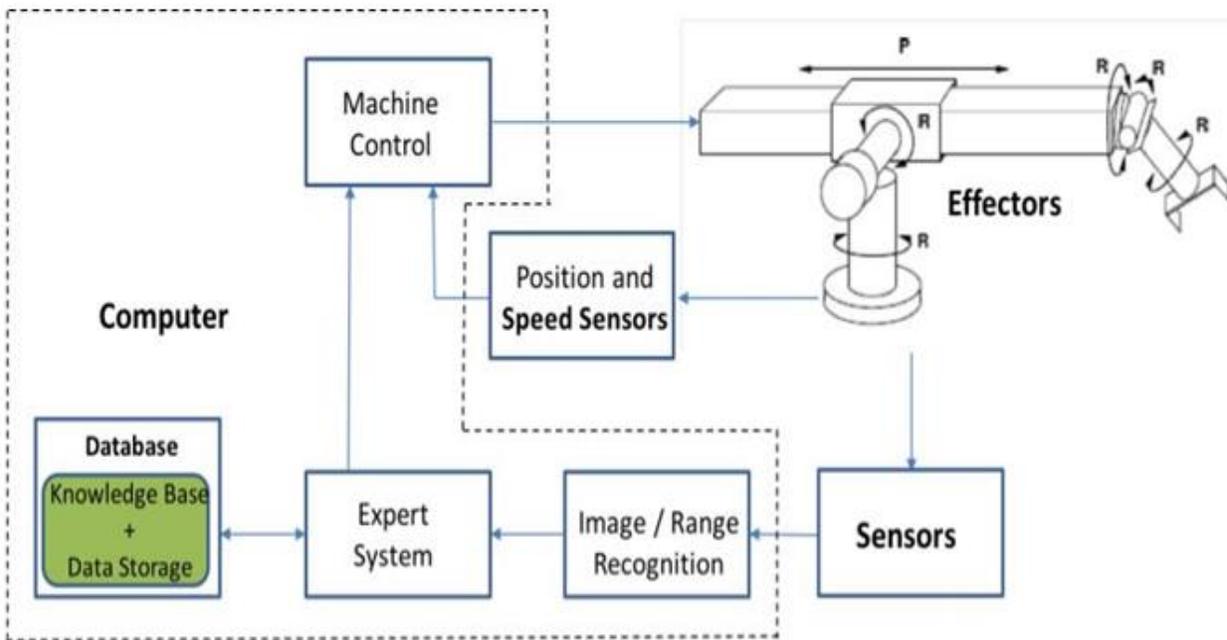


Figure 1. Components of an intelligent robot

1) Sensors

Sensors are the perceptual interface between the Robot and its nearby environment. Sensors basically divided into two categories: Active sensors and Passive sensors. Sonar, laser, and radar, are Active sensors & are generally used for distance measurements, such as length or depth, to determine the position of the Robot relative to the object. In order to achieve it, they emit energy, and the reflected energy received is used to determine the distance. Close range sensors are ultrasonic sensors, while long range sensors are GPS sensors. Sensors can be audio sensors for listening/hearing and understanding commands, message and speech. Passive sensors, like cameras, are used to hoard visage of the environment, so they can be examine using computer vision and image esteem techniques. In the planning for a robotic assembly, AI appraise intelligence in need for reasoning, knowledge representation, and its use, as well as convention information to update the generated plans, knowledge base, and world model.

2) Effectors

Effectors are the ways and entelechy by which Robots manipulate their environment by either moving or changing their shape. Effectors consist of grippers, wheels, and revolute joints. Six degrees of freedom (DOF) are generally required in robot to effectively or smoothly move, pick and place an object/product from one place to another. The three axes (x , y , z) form the three degrees of freedom and also there other three degrees of freedom are *roll*, *pitch*, and *yaw*.

A Robot is best/easier to handle/control when it has more number of degrees of freedom. Figure 2.0 shows a Robot arm manipulator having six degrees of freedom with five revolute joints (R) for rotation and a prismatic joint (P) for sliding.

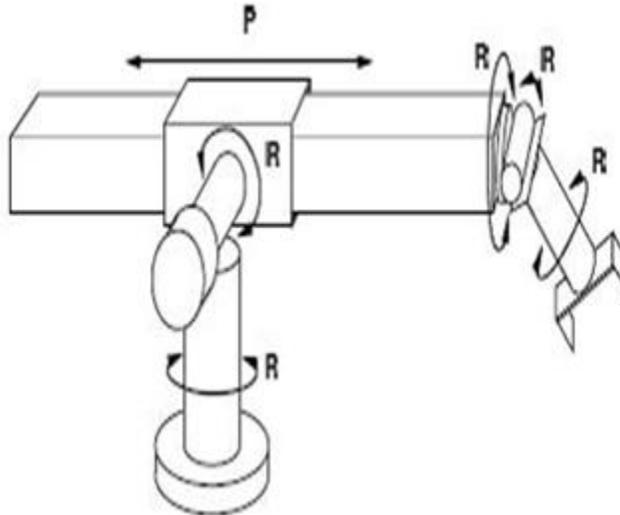


Figure 2. Robot Arm Manipulator

Mobile Robots as per name they are moveable with the help of wheels, tracks, and legs. They use to move product or device/ material from one location to another location.

3) Computer

The computer used could have a single processor or multiple processor. The raw data from the sensors is gathered, structured, and stored in the database. In terms of moving or performing the related tasks correctly, the data is processed for the Robot to make the right decision. Primitive and sensory capabilities can implicitly determine the task that can be performed by the Robot and are constantly improved and updated upon time. How the primitive capabilities are applied to a given task are specified by the program. The Robot needs to be programmed in order to perform the specified task. In the case of industrial robots, the programmer enters the information of their expected position and orientation at certain sub-goals in the assembly task sequence, using an interactive device.

4. Guided Robots and Autonomous Robots

a) Guided Robots

Guided Robots have an operator which is usually in remote location (not in the line of sight of the Robot or cannot see the Robot, except the environment of the Robot which we get to see through the video information which was send back by it). Guided robot has “eyes” in the form of one or two cameras which send captured video information back to the operator who then uses the video information to drive the Robot to move its location and perform the necessary task in between particular space or area. Vision Guided Robots (VGR) is Another form of guided Robots which also uses the video information for monitoring, positioning, and performing the required tasks, especially in manufacturing (in a production plant).

b) Autonomous Robots

Autonomous Robots can perform required tasks without human intervention in an unsupervised manner that’s why they have intelligence incorporated into them and they perform tasks with a great degree of autonomy. This is required for certain tasks such as chemical painting, household cleaning, and delivery of goods. While learning and quickly adapting to their changing environment, they are able to gain information on the environment in which they operate. These Robots can operate in underground tunnels, underwater, and in the air.

VI. IMPACT ON SOCIETY

Will robots take over the world? Will robots crush the human race? Will we human become the biological slaves of robots? Or more realistically, will robots take our jobs? The idea that robots will replace humans in the workplace is a growing day by day. Already, humans are facing this problem, many being displaced from their jobs and their robotic replacements showing up for work instead. Would you allow a robot to drive a car for you? Is it ok if a robot operate on you? Would you want robots to fight wars for your country and make instant decisions? More importantly-the main question arises here, whose fault is it when something goes wrong, the owner of the robot or the builder of the robot? As robots continue to penetrate into our daily lives, these questions need to answers.

A. Jobs

Although many in this world would like to blame engineers for creating robots and succeeding such a great advancement and thus leading to those robots taking other people's jobs. Through this process, Engineers are also creating their own robotic replacements as they can very easily replace engineers in the fields of software development and coding. Jobs like roofers, accountants, translators, electrical and electronic equipment assemblers, postal service workers, fashion models, jewelers and precious stone and metal workers, drivers, cooks, grinding and polishing workers, cashiers, bookkeepers, legal secretaries, credit analysts, milling and planing machine setters, operators, and tenders, packaging and filing-machine operators and tenders, procurement clerks, umpires and referees, tellers, loan officers, timing device assemblers and adjusters, tax preparers, and telemarketers have the greatest risk of being taken over by robots/ intelligent machines. Jobs like stockroom workers, bartenders, pharmacists, farmers, bomb squad, journalists, and housekeepers have already been taken by robots/ intelligent machines. Jobs that are associated with: creative arts (dancers), professional sports (athletes), healthcare and medicine (social workers and psychiatrists), education (teachers), quality assurance (error management), and politics and law (legal leaders, lawmakers, judges, and juries) have the least risk of being taken over by robots/ intelligent machines.

B. Driverless Cars

Through new and advanced technology driverless cars have now become a reality, but with all good things come the bad. Their invention is meant to ease people's commute to and fro. But, what happens when something goes wrong? Who will be responsible for the damage done? Who will be responsible for the most valuable life? Who will be responsible for the medical bills of the injured? Then whom you will blame for those injuries, the car owner or the car's manufacturing company? These ethical issues need to be faced before putting driverless cars jumping with joy about the invention of these cars. And, what about all of those taxis? Will driverless cars replace them, putting thousands of taxi drivers out of work, as they transport people to their destinations? As the technology associated with driverless cars increases and as engineers fix the outstanding problems, driverless cars will become a common sight on the roads, displacing thousands of workers.

A. Dr. Bot

Surgery by a robot, has become a growing trend in the medical field. Doctors navigate the robotic arms via a console/placate into the small cavities of the human body enabled by the Robotic surgery. This procedure allows for preferable accuracy and efficiency. Doctor's allows Robotic surgery to perform surgery on their patients while not being in the same place. What will the future be like? Now a days, most of the robotic surgery is controlled or monitored by physicians. Will in future people have gained enough trust in robot doctors as much they trust on human doctor's? Maybe you look up to see Dr. Bot hovering/flit above you when you lay down on the operating table next time.

D. Killer Robots

Globally Robots are used for many purposes and organizations, including the military through unmanned tanks and drones and by robotic weapons. Rate of human fatalities reduces due to use of robots for military purposes. The amount of necessary manpower can also be reduced by using Robots. On the other hand, what if the super intelligence acquired is used for purposes of extermination? Self governing/ Autonomous weapons programmed to kill in the hands of a wrong person could easily lead to mass destruction. These weapons could also be designed to

be extremely difficult to turn off once they are set in the “arm mode”, which can be used to essentially to thwart the enemy. In cases like this, humans who have designed such systems or robots might not have fully control over them. There is also a grave danger when these Robots are given ambitious tasks, which in the process of achieving it, could wreak or vindicate havoc desolation on the ecosystem. How will a robot know the difference between friend or foe/enemy or the opponent team? And more importantly, what will happen when a robot accidentally kills own team member?

VII. CONCLUSION

Ateriorly research will be rooted on (AI) Artificial Intelligence with Deep Learning Algorithms and Deep Architectures. Nowadays, Problem was that exercitation takes a long time. This gamut should patronage machines think like humans, and thus making Strong AI a reality.

Further quest is required in the areas of sensors, where touch and feel urge to be perfected, since building Robots resembling humans would require them. So, is it possible that the robots controls the humans life or will robots take over the world? Who knows? Only time will tell.

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