Role of Artificial Intelligence in Robotics

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***Abstract*:- Artificial intelligence (AI) is a broad spectrum section of computer science which is related with structuring of smart machines or so called robots. These machines are skillful and can perform activities that require human brilliance. Science, Engineering and Technology combine together to form robotics which in turn produces robots that can substitute or replicate human actions. These tasks can vary from machines that are used to help in daily households to machines used in defence. There is this regularity and dependence that certain sectors especially manufacturing sector rely on imported products for reduced operation costs with the aid of AI assisted Robots technology. However in the larger perspective of maintaining competitiveness across the world in the modern era economy in the near future, magnifying domestic superiority is a bigger test that is very crucial as progressing along with the expansion of the global market with the assistance of robotization.**

Keywords: ***Artificial Intelligence, Application, Robotics, Exploration, Technology***

I. INTRODUCTION

Artificial Intelligence and Robotics have a common origin and a very long synergic history. We can observe that the upsurge of both Artificial Intelligence and Robotics took place in the same period [1] and during the early stages there was no clear differentiation between them. This is because of the label of "intelligent machines" generally lead to robotics and Robots [2].

Robots require AI Technology to work according to commands from the user or the administrator or to the situation in the neighborhood. In accordance to the Moore's Law the processing capability of computers is progressing exponentially. There are certain challenges right now that need to be addressed: Currently we are able to come up with one solution to one query or requirement based on the preloaded information that's available in the backhand, whereas it's still challenging to give a feedback which is natural developed on the analysis of the circumstances of the instruction given or by understating what someone really means, responding to untold circumstances is one other challenge that needs to dealt with as the machine translation is still in the developmental stage[3].

It is very essential to study the modularization of AI and software in terms of developing resources and also improving it and concentration of research. These threats need expansion and synthesis of AI which is driven by the data and AI represents brilliance," R n D" of machines which work like brain. Sensing and recognizing technology to import information [4], [5]. As the prices of semiconductor has decreased making it easier for its usage in terms of the standard as well as quantity.AI can be used in various fields as shown in figure 1.

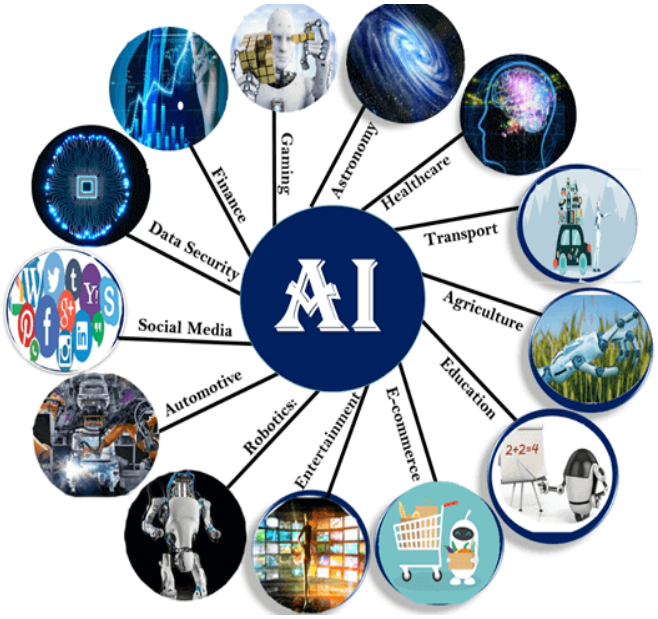

Figure 1: AI used in different fields

II. BACKGROUND STUDY (LITERATURE)

We can see many different applications in different industries like manufacturing, agriculture, entertainment, etc .As there are few jobs which require boring tedious work these works usually require precision and accuracy. In such scenarios, robots or AI powered machines are more convenient to be used than human labor. There are a few tasks which can be dangerous for the life of a human. Robots are better suited here as well as this prevents loss of human life due to these superiority factors we can see that robots are now used almost in every industry. Here let us look at a few top applications of robots in different industries now.

1. Safety

How important is human life and how tedious can it be to keep guarding a place for countless hours in order to overcome this robots are now being suggested as security guards as they can safeguard humans, wealth in banks , and their life wouldn't be in danger unlike humans [5]. Currently, different companies are working on having security robots along with human consultants. These robots can be helpful in avoiding and facing different crime activities, currently the trials are being done . We may get to see robots as security guard in the near future

2. Space Exploration

Certain things in space are very vicious for a human to do. They can't walk around on other planets all day just to retrieve samples of the soil, stones neither can they repair the spaceship if it is broken from outside while it is in deep space. Hence, robot is one such great alternative to look up to [7]. So robots and autonomous vehicles are now being used by space institutions like NASA frequently to do things that are difficult for a human to do. Mars Rover which is also a robot ,It can travel on Mars also has the ability to click photographs of the formations of rock that are very essential and then forwards the pictures back to the scientists of NASA for further research and study. Figure 2 shows a picture of space rover

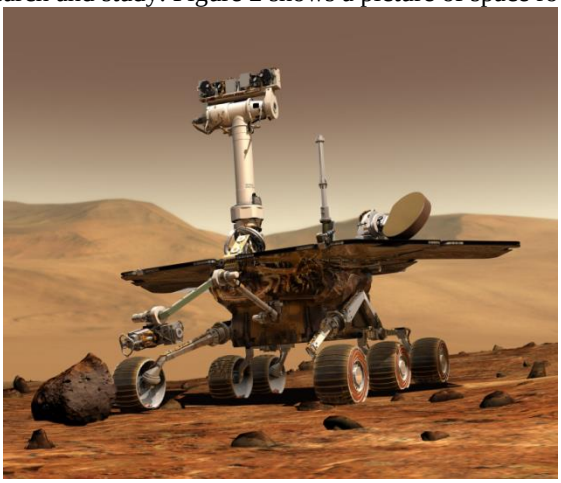

Figure 2: Mars rover

3. Entertainment

Robots can be of big help in the entertainment industry too. They can be used in the background works as in behind the sets during the time of shooting in movies and serials. They can be used to manage the camera, provide special effects. A creative industry is after all a creative industry [9]. Stunts can also be performed using robots which may seem cool in an action movie also it reduces the risk of human life. Autonomous robots are now being used by Disney land to amplify the adventurous experience of the visitors.

4. Agriculture

Agriculture is one such sector that is highly dependent on the weather conditions for the yield of the crop. There are tasks that need to be done repetitively which will waste farmer's time which he can spend it on other works that are essential to be done. The tasks that robot can do include implanting, control of weeds, collecting ripe crop. Ecorobotix (figure 3) is one such robot that is used to remove weeds in farms. It is powered by solar energy. It is used to spray weeds.

Figure 3: Ecorobotix

5. Health Care

Robots have had a lot of positive impact on the healthcare sector. Operations can be performed more precisely with the help of robots. They can

Figure 4: da Vinci robot

They can also be used to give therapy to the victims [8]. There is countless number of Possibilities. ***da Vinci robot*** as shown in figure 4 is one such example which provides assistance to the surgeons to perform complicated operations relating sensitive parts such as head, neck , heart etc.

6. Military

Robots are also used in military or defence sector. At times they are used in the form of drones to keep a track on the enemy, can be used as weapons which are armed in order to attack the enemies or can be useful in transferring medical kits to Medicare agents. One of those robots which is used in Military is MAARS in figure 5.

Figure 5: MAARS

MAARS (Modular Advanced Armed Robotic) are a System with a tank like structure containing lasers and tear gas. The main purpose of this is to confuse the enemies; this also contains a grenade launcher to hold grenades, which may be used to attack the opponents in tough situations[10]. DOGO as shown in figure 6 is also a robot that contains a camera for the purpose of monitoring on the activities of the enemy and also holds a 9-millimeter pistol again useful under tough situations.

Figure 6:DOGO

III. RESULT AND DISCUSSION

AI is one such branch of science and engineering which a lot to do and achieve in the coming future .AI in robotics can do wonders in helping us with doing all the work that has to be done.

It is still in the development stage which once fully developed can make complex things simpler and faster. Figure 7 is the graphical representation of the improvement in terms of revenue generated in the field of AI in the following years to come. This is a clear indication of the increase in the demand for AI in the software market.

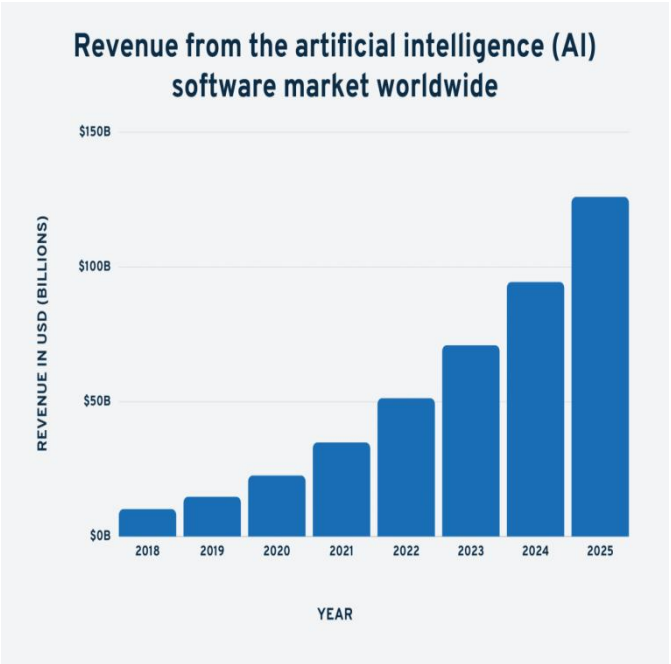

Figure 7: Graphical representation the revenue generated from AI

IV. CONCLUSION

There are a certain things that are changing in the robotics sector one of them being that the activities that robots perform, from just being able to perform simple routine tasks they are now able to perform various autonomous activities. There are high expectations on the improvement of the capacities of the robot in the coming future ,also in the enrichment of AI technology for example voice recognition, enrichment in the sensor technology will make way to a kind of processing that is more skilled than it was never before.

More the enrichment of the AI technology more it helps in boosting the economy of the nation because for any business to be efficient and in order to persist with the competition in the industry they will need to make the manufacturing by themselves or will need to depend upon the raw materials that are manufactured in the same nation as the company is set up in, just to make sure that their demand and supply chain is stable and manufacturing cost is less and effective. In the future as the technology makes progress to greater heights, it will make sure that there are new and better ways in which the robots are used this will only guarantee better profits, making way for new hopes and better potentials.

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