

Artificial Intelligence In Robotics

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Abstract- Artificial Intelligence and the Robotics has a common root since many years and have long and effective scientific discussion. The birth of Artificial Intelligence AI and Robotics together takes place in the same period 1950, and at first, initially there were no clear distinction between the two disciplines that is Robotics and AI. The main reason behind this is that the “intelligent machine” naturally leads to robots and Robotics using AI. One might think and will argue that not every machine is a robot, and certainly Artificial Intelligence AI is concerned with virtual agents (i.e. agents that are not embodied in a physical machine). On the other hand, many of the technical problems came during it and solutions that are needed in order to design perfect robots are not dealt with by Artificial Intelligence researchers. A clear distinction between the fields can be seen in the 1970’s and ‘80’s, when the Robotics became more and more focused on industrial automation that it did ever before, while Artificial Intelligence uses robots to demonstrate that machines can act also in everyday environments. However, current AI technologies are limited to very few and very specific applications. One limitation of AI is that it lacks the term “common sense”, the ability to judge information beyond its acquired knowledge. A recent example is that of the AI robot Tay developed by Microsoft and designed for making conversations on social networks. It then shortly disconnected after its launch because it was not able to distinguish between the two emotions that is positive and negative human interactions. AI is also limited in many terms such as emotional intelligence.

Keywords- Robotics, AI, Mobile information robots, industries, military, Medicine, Explorations.

I. INTRODUCTION

Robotics and Artificial Intelligence used to amplify human potentials to get much out of it as humans are the perfectly created machines, to increase productivity and are moving from simple and basic reasoning towards human-like cognitive abilities and human emotions. To get complete knowledge of the impact of AI, it is important to draw lessons from the past successes and failures, as well as to anticipate its future directions and potential legal, ethical and socio-economic implications. Artificial Intelligence AI is a commonly employed designation to refer in the field of

science aimed at providing robotics, machines with the capacity of performing functions such as logical decision making, reasoning, planning, learning, and perception. Despite the reference to the “machines” in this definition, the latter could be applied to “any type of living intelligence from humans”. Likewise, the meaning of intelligence, as it is found in primates and other exceptional animals for example, it can be extended to include an interleaved set of capacities, including creativity, emotional knowledge, and self-awareness. A robot is a nothing but a machine that scans, searched and gathers the information about its environment (senses) and makes use of that information (thinks) to follow instructions and protocols to complete its task and work (acts). A robot is an electromechanical or bio-mechanical device or group of devices that can perform repetitive or preprogrammed tasks. A robot can act in various ways, it may act under the direct control of a human, for example the arm on a space shuttle, or under the control of a programmed computer, like a machine operating another machine. Robots are being designed and developed in such a way that they can perform precision surgery, explore space, the ocean, and other dangerous areas where humans cannot reach.

1.1 Examples

Some of the best examples of robotics using AI

1. Sense and respond
2. Process Optimization
3. Mobile information robots
4. IROBOTS : Smarter Home Robots
5. HANSON Robotics : Building Humanoid Robots

II. APPLICATION OF AI IN ROBOTICS

The robotics using AI is used in the various domains such as

- 1) Industrial area: Robots are used for handling material, cutting material at exact precision, welding, color-coating, drilling, polishing and other various stuff in the industries.
- 2) Military Uses: Autonomous robots can reach inaccessible and hazardous areas during war or any surgical operations or in natural hazardous areas. A robot named Daksh, developed by Defense Research and Development Organization DRDO,

is successfully deployed and is fully functional to destroy and remove life-threatening objects safely and effectively.

3) Medical Usages: The robots are capable of performing hundreds of clinical tests simultaneously, rehabilitating permanently disabled people, and performing complex surgeries such as brain tumors and much more.

4) Space Exploration: The robot rock climbers used for space exploration, underwater drones used for ocean exploration are to name a few.

5) Entertainment: Disney's engineers have successfully created hundreds of robots that are deployed to create animated movies, by accepting data through engineers.

6) Robots are mostly used in manufacturing and delivering goods (since the mid 1960s). In the auto industry they amount to more than enormous half of the "labor" as humans provide.

7) Robots can serve as a waiter and can cook also at the same time. Boris is a robot that performs as a dishwasher.

III. THE FUTURE OF ROBOTICS USING AI

Most experts suggest on the future of robotics that, it will dwell on advanced cutting edge technology such as vision, tactile, sensing, and artificial intelligence, certainly, many incredible and innovative technological advances will take place in these areas in near future. However, an equally significant impact on the factory floor will be made by simple, low-cost, low to medium-technology robots. The popularity of these low-cost robots should increase rapidly than overall robot growth as millions of smaller and more diverse companies introduce robots into their factories. Today robot use in the United States is concentrated in larger firms. Industrial marketing theory concludes that early adopters of new technology using AI tend to be the largest firms as they are better able to afford the required investment and absorb the risks. Also, they have the technical support necessary to introduce, operate, and maintain sophisticated technology.

Advantages:

- i. AI have very low rate of error and is very rare to make mistakes compared to human beings, if coded properly. They would have incredible while performing tasks, make precisions, with extreme accuracy, and unbelievable speed.
- ii. Systems using AI won't be affected by hostile environments, so that it will be to complete

dangerous tasks, exploration in space, and endure problems that would injure or kill human being.

- iii. This can even mean mining and digging and finding fuels that would otherwise be difficult and in many cases impossible to humans.
- iv. It can be used to replace human difficult task such as in repetitive, tedious tasks and in many tasks that seems impossible for humans.
- v. It can predict what a user will type, ask for and then search for it.
- vi. They can easily act as assistants to humans and can direct various operations and actions.

IV. CONCLUSION

Machines functionality can be increased if used with AI, as solving problems, manufacturing and making inferences, learning, understanding and implementing languages that have already been coded as computer programs. AI programs outperform human experts in any field. The necessity of providing solutions that work efficiently in the real world has propelled enormously that AI researches along significant new ways of investigation in perception and planning. For the endeavor to be successful, further advances will be needed from AI in the areas of belief revision and learning. Therefore, having robots helps business owners to be competitive, because robots can do jobs better and faster than human beings.

REFERENCES

- [1] http://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_robotics.htm
- [2] David R. Schneider, Clare van den Blink NASA, DAVANNE, "An Introduction to the NASA Robotics Alliance Cadets Program" Cornell University / Cornell University CIT drs44@cornell.edu, cv36@cornell.edu
- [3] V. Daniel Hunt "Industrial Robotics Handbook" Industrial Press Inc. 200 Madison Avenue New York 10157
- [4] Stuart J. Russell and Peter Norvig, Prentice Hall, "Artificial intelligent model approach" Englewood Cliffs, New Jersey 07632.
- [5] Vibhu O. Mittal, Holly A. Yanco, John Aronis, Richard Simpson (Eds.), "Assistive Technology and artificial Intelligence"
- [6] Robin R. Murphy, "Introduction to AI ROBOTICS," A Bradford Book The MIT Press Cambridge, Massachusetts London, England.
- [7] B. Jair M. Abe, Joao I. da Silva Filho, "Advances in Logic, Artificial Intelligence And Robotics LAPTEC 2002"

- [8] <http://www.slideshare.net/ranger7721/robotics-artificial-intelligence-3536905>
- [9] L. Chittaro and A. Montanari. Efficient temporal reasoning in the cached event calculus. *Computational Intelligence Journal*, 12(3):359–382, 1996.
- [10] S. Coradeschi and A. Saffiotti. An introduction to the anchoring problem. *Robotics and Autonomous Systems*, 43(2-3):85–96, 2003.
- [11] P. I. Corke. *Visual Control of Robots: HighPerformance Visual Servoing*. Wiley, New York, 1996.