

A BRIEF STUDY OF ROBOTICS AND ARTIFICIAL INTELLIGENCE

Prakash Chandra Jena¹, Sanjaya Kumar Sen², Bijayalaxmi Jena³

¹Asst. Prof. Einstein Academy of Technology and Management, Bhubaneswar, India

²Asst. Prof. Einstein Academy of Technology and Management, Bhubaneswar, India

³Student, Einstein Academy of Technology and Management, Bhubaneswar, India

Abstract

The way of developing intelligence in machines and computers is called Artificial Intelligence is. The purpose of behind writing this paper is to get knowledge about the Artificial Intelligence Proposing and implementing the new idea in the field of Robots accompanied with Intelligence.

Keywords: Artificial Intelligence; Robotics, Machine Learning; Industries; Technology

1. Introduction

Artificial intelligence is the branch the science which deals with all the contents related to intelligence. As far as intelligence is concerned it is defined as “The capability of reasoning, thinking and to make decisions.” And this is the reason we are more concerned about the intelligence power given to machines and robots. When machines or robots inhibit intelligence it is called as artificial intelligence. Hence AI is medium and robots are agent on which the concept of intelligence is implemented.

2. Research Areas of AI

The domain of artificial intelligence is huge in breadth and width. While proceeding, we consider the broadly common and prospering research areas in the domain of AI:

3. Goals of Artificial Intelligence

The overall research goal of artificial intelligence is to create technology that allows computers and machines to function in an intelligent manner. The general problem of simulating (or creating) intelligence has been broken down into sub- problems.

- In early days Artificial intelligence was used to develop reasoning and problem-solving skills.
- With Artificial intelligence knowledge representation has become easy. Knowledge representation is representing information that machine or computer can understand.
- Robotics has transformed thanks to artificial intelligence, that help robots acquire intelligence and perform task smartly.
- Develop systems that can recognize, interpret, process and simulate human effects. All these can be achieved when intelligent systems can predict their motive and emotions. Quality of interpreting human affect could help in better decision making.

4. Advantages of Artificial Intelligence

- Artificial Intelligence is difficult for beginners yet it offer great opportunities for developing intelligent machines that can transform computer science on its head.
- Reduce human errors and perform various tasks with greater efficiency by using intelligent systems.
- AI drives down the time taken to perform a task. It enables multi-tasking and eases the workload for existing resources.
- AI enables the execution of hitherto complex tasks without significant cost outlays.
- AI operates 24x7 without interruption or breaks and has no downtime
- AI augments the capabilities of differently able individuals
- AI has mass market potential; it can be deployed across industries.

- AI facilitates decision-making by making the process faster and smarter.

5. Contribution to AI

Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving.

6. AI Techniques

In the real world, the knowledge has some unwelcomed properties:

- Its volume is huge, next to unimaginable.
- It is not well-organized or well-formatted.
- It keeps changing constantly.
- AI Technique is a manner to organize and use the knowledge efficiently in such a way that:
- It should be perceivable by the people who provide it.
- It should be easily modifiable to correct errors.
- It should be useful in many situations though it is incomplete or inaccurate.
- AI techniques elevate the speed of execution of the complex program it is equipped with.

7. Robotics

Robotics is a domain in artificial intelligence that deals with the study of creating intelligent and efficient robots. Robotics is a branch of AI, which is composed of Electrical Engineering, Mechanical Engineering, and Computer Science for designing, construction, and application of robots. Robots are the artificial agents acting in real world environment. Robotics is an interdisciplinary integrative, at the commence of several areas, ranging from mechanical and electrical engineering to control theory and computer science, with recent extensions toward material physics, bioengineering or cognitive sciences. The AI–Robotics intersection is very rich. It covers issues such as:

- a) Deliberate action, planning, acting, monitoring and goal reasoning,
- b) Perceiving, modeling and understanding open environments.
- c) Interacting with human and other robots.
- d) Learning models required by the above functions.
- e) Integrating these functions in an adaptable and resilient architecture.

II. OBJECTIVES BEHIND ROBOTICS

Robots are aimed at manipulating the objects by perceiving, picking, moving, modifying the physical properties of object, destroying it, or to have an effect thereby freeing manpower from doing repetitive functions without getting bored, distracted, or exhausted.

III. ASPECTS OF ROBOTICS

1. The robots have mechanical construction, form, or shape designed to accomplish a particular task.
2. They have electrical components which power and control the machinery.
3. They contain some level of computer program that determines what, when and how a robot does something.

IV. COMPONENTS OF ROBOTS

Robots are constructed with the following:

1. Power Supply: The robots are powered by batteries, solar power, hydraulic, or pneumatic power sources.
2. Actuators: They convert energy into movement.
3. Electric motors (AC/DC): They are required for rotational movement.

4. Pneumatic Air Muscles: They contract almost 40% when air is sucked in them.
5. Muscle Wires: They contract by 5% when electric current is passed through them.
6. Piezo Motors and Ultrasonic Motors: Best for industrial robots.

CONCLUSIONS

AI is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. Robotics and AI are playing an increasingly important role in now a day. We need to be open and fully prepared for the changes that they bring to our society and their impact on the workforce structure and a shift in the skills base. Stronger national level engagement is essential to ensure the general public has a clear and factual view of the current and future development of robotics and AI.

REFERENCES:

1. <https://www.hcltech.com/technology-qa/what-are-the-advantages-of-artificial-intelligence>
2. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_research_areas.htm
3. https://www.researchgate.net/publication/331247477_An_Innovative_Study_on_Artificial_Intelligence_and_Robotics
4. B. Argall, S. Chernova, M. Veloso, and B. Browning. A survey of robot learning from demonstration. *Robotics and Autonomous Systems*, 57(5):469–483, 2009.
5. N Ramesh, C Kambhampati, JRT Monson, PJ Drew, "Artificial intelligence in medicine", 2004.
6. Solvang, B.; Sziebig, G. & Korondi, P. Multilevel Control of Flexible Manufacturing Systems , *Proceedings of IEEE Conference on Human System Interactions (HSI'08)*, pp.785–790, ISBN 1-42441543-8, May.2008.
7. Balkeshwar Singh. Role of Industrial Robots in Lean Manufacturing System *Journal of International Journal of Scientific Research*