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HUMANOID ROBOT (HERO)

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ABSTRACT

Man is the most advanced creature of character. I believe that humanoid robots are going to be the most advanced beings of humans. Among man-made creatures such as automobiles, hand-phones, and multimedia devices, robots of the future will be an ideal accessory for the citizen. Robots can live up to the expectation of today because intelligent and autonomous robots of the future can free humans from repeated physical and mentally challenging routines, or reduce them.

For example, a doctor robot may provide medical advice, pre-diagnosis, and even assistance in surgical operation; The robot nurse could assist patients at the hospital or at home; The robot soldier can participate in military intervention, and can also fight terrorism; Robotic tutor can help our students to have a better learning experience; Robot guards can make our society more secure. The robot maid can keep our house clean and safe, and even helps to take care of the elderly people of the house; Robot racequires can be deployed in places where human life is in crisis. The list of applications with intelligent and autonomous robots is increasing day by day.

KEYWORDS: Humanoid Robots, Robot Human Interaction, Autonomous Robots.

I. INTRODUCTION

The exponential development of humanoid robots brings a new shift in the boundaries of robotics as a scientific and technological discipline. Today the technology of sensors, microcontrollers, microcomputers, new materials has recently overcome the barriers of real-time integrated control of dynamic systems such as humanoid robots. These types of robots today possess about fifty degrees of freedom and are updated in microseconds of controller signals.

The work is promoting some new ideas concerning the already visible trends of expanding humanoid robotics activities to conceal the above new works. Novelty relates to a generalized approach to modeling human attitudes. Instead of a general inductive approach that starts with the analysis of various real motion conditions and tries to make a generalization, the work proposes a substitution deductive approach.

I am of the opinion that there are still limited results at human-like speeds, while many viable options have arisen in the field of human-communication. In contrast, human-like intelligence is the main obstacle to be overcome due to its complexity and multidimensionality; It is also responsible for coordinating the entire individual robot behavior.

In this paper, we pick up and formulate critical demand situations of humanoid robots, evaluate genuine brand new robots available in the market, and briefly examine their features and routine use cases.

The rest of the paper is organized as follows. Section II introduces the beginning of robotics with its history and types of robots. Section III discusses the application of robotics in various fields. Section IV shows the robot's interactions with humans. The discussion is in V section. Finally, Section VI concludes.

II. BEGINNING OF THE ROBOTICS

The robot first appeared in 1920 within the play 'Rusum Universal Robot', written by Czech writer Capac. The play depicts full-fledged workers - robots, endowed with feelings capable of increasing their productivity. Concepts like today's robots are often dated to 450 BC. Greek mathematician Tarantum posted a mechanical bird, which he called 'The Pigeon', powered by steam. Al-Jazari, a Turkish inventor, developed automated

machines such as water-powered water clocks, kitchen appliances and musical automa. One of the first recorded designs of humanoid robots was made in 1495 by Leonardo. Leonardo da Vinci's notebook, rediscovered in the 1950s, contains a detailed portrait of a mechanical knight able to stay awake, wave his hands, and move his head and jaw. The first working robot was built in 1738 by Jacques de Vaucaison, who created an android that played the flute, also in the form of a mechanical duck that reportedly ate and defecated. In 1893, George Moore created a steam man. George Moore was powered by a 0.5 hp gas fired boiler and reached a speed of 9 mph (14 kph). Westinghouse created a humanoid robot known as Electro. Electro was first shown at world fairs at the 1939 and 1940 exhibitions, while the first electronic autonomous robot was built by Gray Walter in 1948 at the University of Bristol, England.

Examples of various types of robots for antiterrorism action, deactivating explosive devices, locating and destroying mines, lifting fruits, concrete works, digging and maintaining underground channels, cleaning high-rise buildings, tanks and pipelines Replacing damaged parts of, damage within electricity. Robot-butchers for sheep shearing, meat carving and deboning, micro-robots for inspection of the intestinal tract, and even for checking blood vessels standard, without shutting down the power network Etc. There are many efforts during which robots occur. Performed a delicate surgical operation, either on the spot or at a distance. Robotics, therefore, expands the boundaries of its application, allowing robots to acquire entirely new functional frameworks and types of construction. Thus, for example, a drone is actually a robot-aircraft, and an automatically guided tank (vehicle) with controlled fire action on the target, again a robot of its kind; Automatically guided torpedoes perhaps a submarine robot; An aircraft can be a drone that will not only track the target that must be destroyed but, relying on artificial intelligence, also detect it.

a) Humanoid Robotics

In 1969, Humanoid Robotics first introduced the phenomenon of active exoskeletons, within the Earth. Carried out within the Mihajlo Pupin Institute under the guidance of Vukobratovic. Also, the primary theory of those systems is developed within the frame of the active exoskeleton, within the same institution. Therefore, it is often said that active exoskeletons were the predecessors of high-performance humanoid robots. Recently, a clear revived interest in the active exoskeleton has been shown before all military surrender. Currently active exoskeletons have been developed as systems to enhance the human natural skeletal system. This natural skeletal system is known as a humanoid robot.

b) Pre-Programmed Robots

Pre-programmed robots operate during a controlled environment where they are performing simple, monotonous tasks. An example of a pre-programmed robot would be a mechanical arm on an automotive production line. The hand performs a task - to weld a door to insert a particular part on the engine, etc. - and the task is to perform that task for longer, faster and more efficiently.

c) Autonomous Robots

Autonomous robots operate independently of human operators. These robots are usually designed to perform tasks in open environments that do not require human supervision. An example of an autonomous robot would be the rumba vacuum, using sensors to rotate freely throughout the house.

d) Teleoperated robots

Telephoned robots are human-controlled mechanical bots. These robots usually combine extreme geographical conditions, weather, conditions etc., e.g. These robots are human-controlled submarines and are used to detect landmines in a battlefield to fix underwater pipe leaks during a BP oil spill or drone.

e) Augmenting robots

Culturing robots either enhances current human abilities or replaces abilities that may cause a person to lose. Some samples to enhance the robot are robotic prostheses or exoskeletons.

Used to lift heavy weights.

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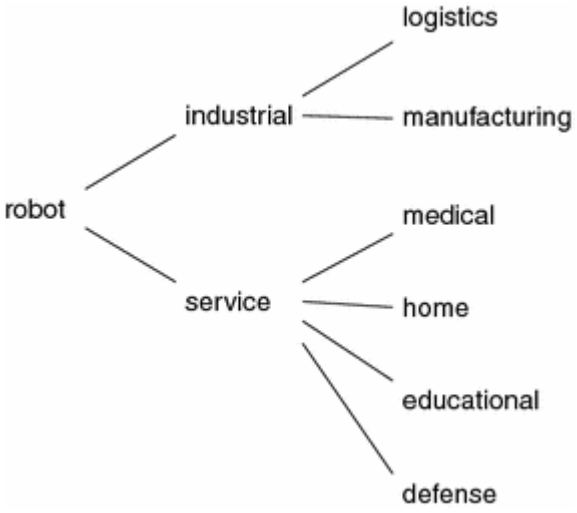

Fig-1: a) Classification of robots by application field

III. APPLICATIONS OF ROBOTICS

Currently, robots perform sort of various jobs in numerous fields and thus the quantity of tasks delegated to robots is increasing progressively. the simplest thanks to split robots into types may be a partition by their application :

1. Industrial robots
2. Domestic or household robots
3. Medical robots
4. Service robots
5. Military robots
6. Entertainment robots
7. Space robots
8. Hobby and competition robots

1. Industrial Robots - Industrial robots play in industrial manufacturing environments. They are typically made for specially used weapons, such as material handling, painting, welding. This type of robot may also contain automatically guided automobiles and other robots if we evaluate them only by application.

2. Domestic or household robots – The robot that reception is used. This robot has a variety of different gears, for example- robot pool cleaner, robot sweeper, robot vacuum cleaner, robot sewer cleaner, and other robots that will work differently. In addition, various types of scrutiny and tele-presence robots can also be considered as domestic robots, if the type of environment is taken into account.

3. Medical robots – These types of robots are employed in medical and medicinal institutions. First and foremost surgical treatment robot. In addition, the diversity of robot-guided automobiles and perhaps raising supporters.

4. Service robots – Robots that can't be classed into the other types by practice. These might be various data collecting robots, robots prepared to exhibit technologies, robots employed for research, etc.

5. Military robots – Robots brought into play in military & soldiers. This sort of robots contains bomb discarding robots, various shipping robots, exploration drones. Often robots at the beginning produced for military and soldiers purposes are often employed in enforcement , exploration and salvage and other associated fields.

6. Entertainment robots – Such robots are fitted for entertainment. This is an extremely broad category and it starts with robotic robots such as a robosapian or running photo frame and ends with actual heavy weights, such as artifact robot weapons such as movement simulators.

7. Space robots – I might wish to distinct out robots employed in space as a split apart type. This type of robots would contains the robots employed on Canadarm that was brought into play in space Shuttles, the International space platform , along side .

8. Hobby and competition robots – Robots that's created by students like water-bots, Line follower robot, robots prepared merely for learning, fun and for contests.

IV. HUMAN-ROBOT INTERACTION

The state of the art for sensory intelligence in robots moves through several orders of magnitude. If we want robots working in our homes to function effectively like vacuum-cleaning and other non-industrial environments, the way they are instructed to do their jobs and specifically to stop them How it is said will be of vital importance. It may be possible that people who are interacting with robots may or may not have very little training in robotics, so any interface would need to be extremely intuitive. The authors of science fiction also feel that robots are ultimately capable of communicating with humans through speech, gestures and facial expressions rather than through command line interfaces. Although speech would be the most appropriate way for humans to communicate but it is unnatural for robots. It will probably be a long time when robots naturally interact as imaginary C-3Ps, Star Trek or next generation data.

a) Speech recognition

It is difficult for the computer to explain the continuous flow The sounds coming from humans are due to its great variability [9].

Speech due to local acoustics, volume, previous word, whether the speaker is cold or not, the words spoken by the same person may sound different. This will become more difficult when the speaker has a different pronunciation [10]. Nevertheless, in 1952 much progress has been made in this area. Davis R. Bidulf and S. Balashek have designed the first voice input system that identifies ten-digit spoken by a single user with 100% accuracy[11].

In the current scenario, natural words 160 words per minute can be identified by the best systems with 95% accuracy. Nowadays machines can use people's voice to identify their emotions with the help of artificial intelligence [12] such as happy, satisfied or angry [12].

b) Facial expression

During the process of interaction between two humans, facial expression can provide rapid feedback and be able to do the same for the robot and human as soon as possible. The robotic face is designed using an elastic called rubber, due to the elasticity of the rubber face coating and the embedded subsurface motors (servos), allowing for a greater number of facial expressions. The coating and servo are formed on a metal skull. Looking at human facial expression and body language robots should know how to approach. Whether the person is mad, frightened, or happy affects the type of expected exposure of the robot. Kissmate and other recent additions such as robots [13]. Nexi is capable of producing a range of facial expressions and allows for meaningful social exchanges with humans.

Research Questions :

In many areas, robots are used in some form like health care, manufacturing, hospitality, education etc. The applications of robots in military construction and research are well established. Humanoid is a specific robot that is in its development phase. Humanoid robots can perform many physical activities like humans. Yet its effectiveness in health care and education is prominent. In this study we are trying to focus on the following questions:

• What is the opinion of people of different age groups and genders towards the acceptance and application of

humanoid robots?

• Can intellectual and social interaction conditions affect humans' attitudes and behavior towards robots?

This paper handles a organized literature review to the answer of above concerns.

V. DISCUSSION

Application is particularly important for humanoid robots in many domains. It has been successfully applied in the fields of education, health care and social. The application of humanoid robots in three broad domains is shown below in figure 1. Most of the research focuses on healthcare [1] [2]. Most humanoid robots were used to treat autism (65%) followed by diabetes (15%), cerebral palsy (10%) and cancer (10%). Humanoid robots improve communication skills among children, autism severity and increased social behavior [3].

In addition, the use of humanoid robots improves learning ability in autistic children, improves collaborative behavior, and interacts with robots that make them feel comfortable and entertained. Successfully treating autism in addition to these humanoid robots produces positive results in reducing stress in pediatric cancer patients and educating patients with diabetes management skills. Patients suffering from cerebral palsy were encouraged by interacting with humanoid robots. Greater use of robots also increases treatment efficiency by paying joint attention between the physician and the patient.

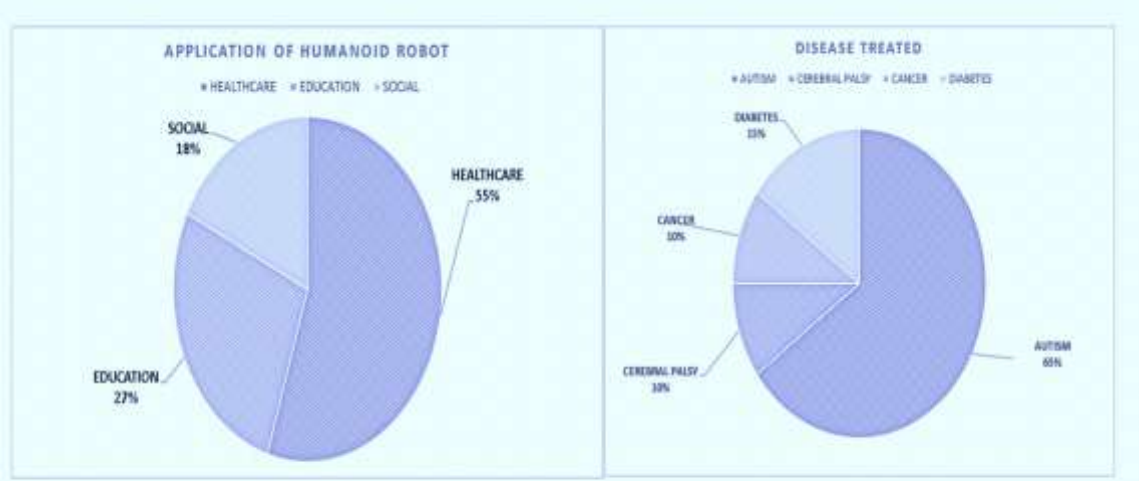

Fig-2: i) Application of Humanoid Robot ii) Disease Treated using Humanoid Robot.

The application of humanoid robots in the field of education has also been encouraging. Studies have shown the positive impact of robots in education; In addition, humanoid robots have served as a guide within the college campus [6]. Figure VI B), developed based on the findings of the literature review, showing the most commonly analyzed foci of humans in education. From the literature POV, it was found that the application of a humanoid robot enhanced participants' connections within a classroom setting, however, no significant increase in learning rate was observed [7]. Research conducted by Barakova in 2015 focused on analyzing the impact of the use of collocated robots and simulations on a student's eagerness. During experiments with both robots and simulators, the performance of such dropout rates, class attendance, task completion rates, creative thinking, and social impact were studied. All measures were much greater when working with a humanoid robot than a simulator; According to a questionnaire developed by Marina and Freidin in 2014, their research, both teacher and students, prioritized the use of a humanoid robot in the classroom. Research has created some parameters and the research was carried out concern, attitude, adaptability, trust and others using questionnaires [7] based on the selected parameters. The study also observed that factors such as social presence and social influence are not relevant to determine acceptance of a humanoid robot [5].

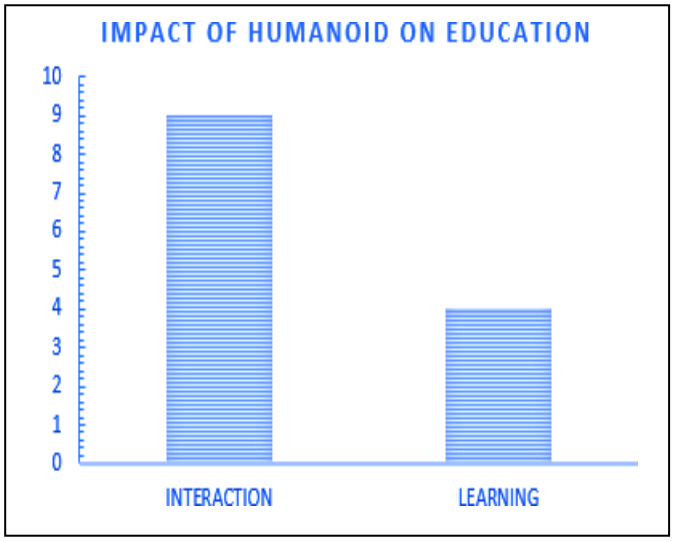

Fig-3: Impact of Humanoid On Education

VI. CONCLUSION

Users have encouraged the participation of humanoid robots in health and education. In contrast, people's attitude towards social or assistive robots changes significantly. Children and elderly patrons prefer robots and have less knowledge about the application of humanoid robots than middle-aged users. The trust and acceptance of humanoid robots was influenced by its look, function and functionality. According to a research conducted by Allied, people felt that using humanoid could invade their privacy [4]. Humanoid robots were preferred over general purpose robots, even people paid more attention to humanoid robots, which are user friendly [8]. The trust of adult female patrons is reduced when the robot constantly watches them; However, users with less confidence had more confidence in the robot. Humanoid robots relied on their knowledge such as weight, size, color, and other quantitative measures, but users did not trust their social and logical knowledge such as good, bad, and other qualitative measures given by the robot. People also believe that humanoid robots intentionally do undesirable actions and there is a greater risk of making mistakes. Unlike adult users, children were concerned about the utility of the robot and not enough. He enjoyed the company of humanoid robots and regarded him as a friend. The children were ready and able to engage with humanoid robots quite comfortably. Older older men had higher concerns about robot functionality than teenagers or women. Patrons want their BOPs to measure fever, connect them remotely to a doctor, remind, entertain them, help with child care management, lift heavy weights, detect falls, control automation in home appliances, housekeeping, phone Call and many other things that can reduce their stress [4].

Key Points:

- A person's social connectivity affects their attitude towards the use of a humanoid robot. Lonely individuals, especially autistic children and older adults, always choose a supportive humanoid robot.
- The way it looks and looks affects the acceptance and trust of the user. Users always prefer humans-like robots, regardless of their age, gender, social and health status.
- The application of humanoid robots to treat autism among children has been found to be useful as well as effective.
- Trust on humanoid robots depends on the importance of the situation that the patron finds himself or herself. The trust factor increases with decreasing user confidence in any quantitative decision-making situation.
- Humanoid robots have been effective in increasing students' participation in various activities in field education.

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