



THE NEW ERA OF ROBOTICS: DEVICES AND SYSTEMS

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ABSTRACT

This paper consists of detailed information about the robot's device and system. As everyone knows, how artificial intelligence is growing in the market and the market is getting totally dependent on artificial intelligence for doing the complex tasks. Robotics is a most famous branch in the field of engineering and sciences where every engineer is taking keen interest to make a robot which can do a certain task and can give appropriate results for the given task. Every engineer is trying to make a robot with 0% error which is quite impossible as the technology is increasing. We can think about it but still 0% does not mean that it will not have any point of error but it means it will give you the correct answer for every question without any doubt. Show its uses its detailed information how it works and how it senses working all is signified in this paper which will be enough for getting and good information about robotics and devices along with the system of robots.

INTRODUCTION

Robot is a human thing which is capable of doing all the work the human can perform in a much less time than a human can take the place of a human but it can help humans for operating much of its task in daily life. Robots are also applications of artificial intelligence and sensors which combine together to form a human machine called robots. There are numerous applications of robots in the world of science and computer application. Scientists and engineers are working on robots to make it almost applicable in every field. It can be semi automatic or fully automatic that is there are many robots which are like human that is they can talk, they can walk without the guidance of a human through programmable language input into them at the time of manufacturing it but there are also semi-automated that is the needle remote for the controllability of its functioning. Robotics is one of the most apted and interesting branches in the field of science and education which is loved by every youth and everyone wants to learn robotics for future use. There are Number of uses in the future where people will be depending on fully automated drama full complex stars as well as for daily works as well as it will decrease manpower in the world because one robot is capable of doing work of 10 persons.

TYPE OF ROBOT

There are 5 types of robots discovered till yet and are in processes. Robots can be as small as 2mm and can be as big as 200 m according to the need they are made and classified in the different types. As the Technology is going on, it will definitely reach a place where robots will replace humans .So five types are-

Pre-Programmed Robots

Pre-program robots or robots that are made for a single task only. It is a program generated robot that mends for a single task as other cars are not programmed in it. For example we can say a mechanical arm has

only one task that is to weld a door on or to insert a part in an engine but it can do a single task related to a card only. The performance of this mechanical arm is quite faster and longer and is more efficient than human work.

Humanoid Robots

Humanoid robots are the robots similar to humans by their behaviour and vocal. These robots can perform work like a human that is running, jumping, carrying objects and many others. These have a similar look as a human face that is the face with the expression. The most famous example for this humanoid robot is Hanson robot Sophia and Boston dynamics atlas both are human-like structured robots which are easily able to do human work.

Autonomous Robots

Autonomous robots are the robots that can be operated without human guidance. These robots are made to do the task in an open environment so it does not require any human guidance to perform its task. For example- roomba vacuum cleaner which moves in house freely and do the necessity.

Teleoperated Robots

Teleoperated robots are mechanical robots that are controlled by humans only. These robots work in place with extreme geographical conditions like weather and other circumstances. The example for this teleoperated robot is a submarine which is used to repair the leakage during oil spills or drones which are used to detect landmines on a battlefield.

Augmenting Robots

Augmenting robots are robots which have the ability of doing work that current humans can do or we can also do the work that humans have lost doing.

The great example of augmenting robots is exoskeleton which is used to lift heavy weights.

Augmenting robots either enhance current human capabilities or replace the capabilities a human may have lost. Some examples of augmenting robots are robotic prosthetic limbs or exoskeletons used to lift heavy weights.

USES

There are numerous uses of robotics in today's world in almost every field. Demand of robotics is increasing day by day in every field so here are some few uses of robotics in the major fields.

Manufacturing

Manufacturing is the main unit where robotics is scratching their hands. These robots are used in manufacturing units because they can work more efficiently than a human worker. There are several industries like cars industry where robots have been successfully taking place of human are working in that industry

Logistics

Budgeting is also a major industry where robots are highly successful in replacing humans as they easily pack the packages that speed up the working efficiency of that company. Robots are working in a warehouse of logistics where they have given the maximum efficiency of work and help the workers in transporting inside the warehouse and packing them.

Home

Robots are also seen in houses where they are helping to do the household works and entertain the kids and other small works in the house. The best examples for this roomba vacuum cleaner that cleans the house and moves in house helping others.

Travel

Due to development there are many self driven cars in the market which were desired many years back. It is possible because of data science and robotics combining together and forming self driven cars for tesla,ford, Waymo, Volkswagen and BMW. These all are working to make more similar cars for the future usage so that there is no use for any human to drive it safely.

Healthcare

Robots have also worked excellent in the field of healthcare as there are many departments that are governed by the robot. From physical therapy to surgeries robots are capable of doing both the things so engineers are working on it to make healthcare more convenient for the treatment of every disease in an easy way.

Best example for this type of robot is Toyota's healthcare assistants, which help people to move again on their feets after any accident or anything.

Everything in the market has advantages and disadvantages in the same way robots also have its advantages and disadvantages which are mentioned below.

ADVANTAGES

COST EFFECTIVENESS

They are very cost effective as they do not take breaks in between as the human body needs a break while working. So this thing makes it cost effective and it can do the same work repeatedly once a cycle is set in it. There is no risk of RSI.

It also lowers the cost of manufacturing with the increase in the amount of production. The cost that one investment in buying the robot will be easily in a very short period of time

IMPROVED QUALITY ASSURANCE

There are very few people who like to do their tasks for a certain time and with full concentration but after that they lose their interest or concentration and start doing it just for money but this is not for robots. There is low risk getting bored or not concentrated because it is made for doing the work and give the higher standard of products that are tough to be found by the human race when people are comparing their jobs with their money not with their interest or field

INCREASED PRODUCTIVITY

Robots increase the productivity rate of an industry as humans can do 24/7 work they have a certain time duration but robots can do work without taking breaks and leaves. Single robot can do work of 10 people and it can be used in a manufacturing unit for different productivity easily. You need to to focus on the staff for their work but the headache of yours is also not job when a robot is working in your manufacturing industry

WORK IN HAZARDOUS ENVIRONMENTS

Everyone can't work at a place with the environment but robots can work in any place without caring about this surrounding. Its production rate is extremely high. It can work. I do know extremely high temperatures on a low temperature where people are tough to do work. It gives output for the work and there is no risk with the robot as like with humans. It's also a major advantage of robots.

DISADVANTAGES

POTENTIAL JOB LOSSES

The biggest disadvantage of robots is that good potential people are getting jobless because robots can do work of a 10 person in a single use so basically everyone wants to save them money so they buy the robot instead of paying 10 potential people for their work.

Show this made a major disadvantage to the human mankind where the unemployment it is more than unemployment and now due to the the invention of robots more peoples are getting jobless day by day.

INITIAL INVESTMENT COSTS

The initial investment is very high when you are going to buy a robot for your work. Though the cost of the investment is reverted in a few months but still one needs to pay much before buying it.

HIRING SKILLED STAFF

When you have a robot which is not totally automatic then you need to hire skilled staff for doing operation of the robots it become very tough to be paid guest take high salary and arranging there salary in your work becomes quite tough so so it's better idea to have a fully automatic robot or pay humans for manpower.

All olive advantages and disadvantages are the basics one and the most important one but there are many other disadvantages and advantages for the same.

CONCLUSION

This was enough detail about robot devices and systems. As the world is getting converted into technology oriented with robot other top most in demand. All engineers in many companies work day and night to make robots as fast as possible. High demand and high cost give rise to an economy very fast. So we should keep searching on robots and its other devices which can give us help in making the world full of Technology where manpower is less. We have seen that robots can do every work of humans and its replacing human power in every field and every aspect so we need to get skilled to that level so that no one can replace you with robots. A robot is a man made thing and it can't take the place of humans in any aspects. Just keep increasing your skills so a man made thing can't replace you with your work. Robot manufacturing can't be close so the thing which everyone can do is increase the skill power and get more faster which can help you to remain at your position without replacement by robot or any other device. There are many resources on robots and robotics everyone needs to read and get the knowledge about it so you don't have to bother in your future to take any decision of your life or for your future generation as future generation will be a generation which is fully automatic and Technology will reach its peak.

REFERENCES

1. Deen, M.J., & Basu, P.K. (2012). Silicon Photonics: Fundamentals and Devices.
2. Ilievski, F., Mazzeo, A.D., Shepherd, R.F., Chen, X., & Whitesides, G.M. (2011). Soft robotics for chemists. *Angewandte Chemie*, 50 8, 1890-5 .
3. Palli, G., Borghesan, G., & Melchiorri, C. (2009). Tendon-based transmission systems for robotic devices: Models and control algorithms. 2009 IEEE International Conference on Robotics and Automation, 4063-4068.

4. Moses, M., Yamaguchi, H., & Chirikjian, G.S. (2009). Towards cyclic fabrication systems for modular robotics and rapid manufacturing. *Robotics: Science and Systems*.
5. Platzer, A. (2010). *Logical Analysis of Hybrid Systems - Proving Theorems for Complex Dynamics*.
6. Agrawal, V., Peine, W.J., Yao, B., & Choi, S. (2010). Control of cable actuated devices using smooth backlash inverse. *2010 IEEE International Conference on Robotics and Automation*, 1074-1079.
7. Hamblen, J.O., & Bekkum, G.M. (2013). An Embedded Systems Laboratory to Support Rapid Prototyping of Robotics and the Internet of Things. *IEEE Transactions on Education*, 56, 121-128.
8. Aguilar, J., Zhang, T., Qian, F., Kingsbury, M., McInroe, B., Mazouchova, N., Li, C., Maladen, R.D., Gong, C., Travers, M.J., Hatton, R.L., Choset, H., Umbanhowar, P., & Goldman, D.I. (2016). A review on locomotion robophysics: the study of movement at the intersection of robotics, soft matter and dynamical systems. *Reports on progress in physics. Physical Society*, 79 11, 110001 .
9. Chiolerio, A., & Quadrelli, M. (2017). Smart Fluid Systems: The Advent of Autonomous Liquid Robotics. *Advanced Science*, 4.
10. Krishnan, R.H., & Pugazhenth, S. (2014). Mobility assistive devices and self-transfer robotic systems for elderly, a review. *Intelligent Service Robotics*, 7, 37-49.
11. Rahul Reddy Nadikattu. 2016 THE EMERGING ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN SOCIETY. *International Journal of Creative Research Thoughts*. 4, 4 ,906-911.
12. Rahul Reddy Nadikattu, 2014. Content analysis of American & Indian Comics on Instagram using Machine learning", *International Journal of Creative Research Thoughts (IJCRT)*, ISSN:2320-2882, Volume.2, Issue 3, pp.86-103.

