

Robotics and Computer Science: Contribution to Modern Life

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Abstract— Now a days in computer science course Robotics is one of the most challenging and experimental part of the study. By writing a program, engineers introduced robotics to the physical world. Robotics is an intrigue inquire about region at the interface of computer science and designing. The objective of Robotics is to plan cleverly machines that can offer assistance and help the world and human in their day-to-day lives to keep everybody secure.

Keyword- *Computer Science, Robotics, Programming, Computer, Engineering, Robot.*

I. INTRODUCTION

Robotics is the department of innovation that bargains with the plan, development, operation, and application of robots. The history of robotics has its roots within the antiquated world. The advanced concept started to be created with the onset of the Mechanical Insurgency, which permitted the utilize of complex machines and the consequent presentation of power. This made it conceivable to control machines with little compact engine. Ben Skora is known as the father of robotics.

He was an American inventor. He created a humanoid robot, 7 feet tall who can take out the trash, walk the dog, serve the drinks and vacuum named Arok. Arok is not new. Skora built it 10 years ago, before the microprocessor changed the electronics world forever. Yet the robot has required little maintenance after years of heavy use. [1] Robotics is actually a combination of mechanical engineering and computer science. How?

You require mechanical engineering to construct the robot physically and Hardware to control the robot to prepare with sensors to from the robot intelligent. You require Computer Science to form the robot lively by using programming.

II. BACKGROUND ”.

Robotics courses are proliferating due to a number of factors. Availability of low-cost robot platforms, faculty enthusiasm, and the need to level the playing field and to help attract new computer science majors are just some of these. Some robotics courses are for computer science majors and serve to introduce students to AI

(Artificial Intelligence) concepts in the context of robotics. Others are pure robotics courses. [2]. Some courses offers a foundation to the area of AI (Artificial Intelligence) through a variation of readings and projects including a robotics workshop. Robots are built using the Handyboard platform and are programmed with Interactive C. There are no course essential. These courses are not part of a CS (computer science) major, or maybe is advertised to understudies exterior the major to complete a common prerequisite.

III.FIELDS OF ROBOTICS

According to some researches there are five major fields of robotics:

✚ **Operator Interface (OI):** A centralized operator interface provides an enhanced situation awareness about the multi-robot teams and the operating domain. Using the interface the operator can specify high-level objectives either as waypoints, paths or areas to search, or low-level direction commands to the boats.[3]. That means this category refers to the communication between human and robots.

✚ **Mobility or Locomotion:** Locomotion defines that how the robot gets from put to place by movement. And Mobility can be accomplished with legs, wheel, blades, propellers and so on.

✚ **Manipulators and Effectors:** It is a progressed capability that sets robots separated from almost all other computerized or automated frameworks. It helps a robot to physically connect with and adjust its environment. For instance claws, pushers and mechanical arms and fingers.

✚ **Programming:** The most used programming language in robotics is C/C++. For controlling the loops, image processing and to interface low-level hardware C++ is operated. Moreover Python is utilized to control high-level behaviors and to rapidly develop tests or proof of abstraction.

✚ **Sensing and Perception:** Robots have to utilize sensors to build an image of any environment they belong. For example a sensor utilized in a few robots is known as LIDAR (Light Discovery And Extending). Lasers light up objects in a circumstances and reflect the light back. The machine analyzes these reflections to form an outline of its environment. Perception is defined as a system that provides the robot with the capability to perceive and find out the surrounding environment.

IV.PROGRAMMING TECHNIQUES IN ROBOTICS

This degrees tries to be a mix between computer science and industrial engineering, oriented to robotics tasks. The first course contains basic subjects (mathematics, physics, chemistry, programming, computer architecture) Then the second course is more related with industrial engineering subjects (electric and electronic technologies, materials resistance, automatics, engines, sensors). In the third course, there are more subjects related with computer science (algorithmics, intelligent systems, computer vision, perception, robot

programming, embed systems, communications) although there still are some subjects related with industrial engineering (robot control, automation). Finally, in the last course, there are several subjects related with robotics tasks or robot types (mobile robots, arm robots, service robotics, multirobots, teleoperation). It is worth noted that all the subjects in the fourth course do need a hard programming skill [4].

V. CONTRIBUTION OF COMPUTER SCIENCE IN ROBOTICS

Computing technology can be a significant portion of mechanical technology. Computer researchers compile the mechanical program stages and are essential for inquiring about high-level programming. [5] Whereas mechanical and electrical engineers center on the equipment perspectives of mechanical autonomy, computer researchers work on programming side.

The educational robotic applied in the current study found that the positive impact to develop students' CT skills [6]. Educational Robotics has become an important skill to express ideas, inspiring student's originality while helping develop logical thinking.[7] Many research attempts to use robotics technologies in education is increasingly common and has the potential to impact students' learning[8].

One of the easiest way to make students interested in their studies can be robotics. As this is a working application it will help the students to learn things practically. It helps with creativity with technical disciplines and brainstorming among the students. So without having a good command on programming

nobody can create a high class and robots which will fulfill their commands or instructions.

VI. IMPACTS OF ROBOTS IN OUR DAILY LIFE

1. **Self- Driving Robot:** The main far reaching, high perceivability utilization of portable robots are seen via Autonomous Self-driving vehicles. The advancement of computerized self-driving vehicles improvement is astounding in the ongoing 10 or 15 years. New autos without advanced mechanics resemble a PC with wheels. Be that as it may, with mechanical technology, they are more productive and risky free.

2. **Security, Defense, and Surveillance:** The Job of a security, protection, and reconnaissance robot is typical. It overviews the ideal territory. It promptly advises the proprietor if there is any sort of unsettling influence happened. This sort of robot is utilized in the military. This sort of robot can likewise be utilized in human day by day life.

3. **Medicine:** Recently, Google and Johnson & Johnson are working together to create next-generation medical robot system. In the recent past, robots were only used in the clinical system just as assistants. But now, they are introduced as part and parcel of the clinical system. Though it is not possible yet, it is not too far that robots will replace surgeons in surgical operations. [9]

4. **Education:** Science has made it conceivable to take in something from a good ways place. Innovation has just made it conceivable and will just keep on creation it better. Presently, instructors

can show a class even not at present in the class. All things considered, a telepresence robot takes care of the work. That robot demonstrations like a human and is constrained by the individual himself from a good ways place. Thus, understudies think that its intriguing and intuitive to cooperate with the individual through the robot.

Without these fields, the uses of robots and robotics are increasing in daily life. For example, in dangerous jobs, as a servant, home automation, in space works, crime fighting and so on.

VI. CONCLUSION

The resulting robots will become quite formidable. In fact, I am sure they will outperform us in any conceivable area of endeavor, intellectual or physical. Inevitably, such a development will lead to a fundamental restructuring of our society. Entire corporations will exist without any human employees or investors at all. Humans will play a pivotal role in formulating the intricate complex of laws that will govern corporate behavior [10].

It will increase more job opportunities in the future. And after researching it is obvious that robotics is not complete without computer science. However in the near future we can see that robots are taking the places of human and it is not impossible though. It will make our living more easier. But it will have some side effects also. So robots should made with their three major principals. Now we can just wait for that!

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The book edited by Kazuya Yoshida and Satoshi Tadokoro named “Field and service Robotics: Results of the 8th International Conference” helped me a lot to gain more knowledge on this topic. This book has a clear description on the relation between robotics and computer science.

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