

Contextual Investigation And Testing On Robotics And Industrial Engineering

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ABSTRACT-

Engineering and technology are rapidly evolving fields that are affecting our way of life. Engineering and technology frameworks are used in a variety of disciplines, such as education, information, computer and health care. As a result, we dislike the safety of its application. People and robots both have advantages and disadvantages, and if we can successfully get them to collaborate, it would be a fantastic job or a huge accomplishment in each industry. In this investigation, we will look at the new modern upheaval, the numerous types of robots that are utilised, robot testing, and much more. bonding connection point of each CLOUD, according on each associated CLOUD's soliciting, refreshing, or recovering properties.

Keywords: Industrial robots, Cloud, Automation, Sustainability and growth, testing of robots.

I - INTRODUCTION

Study about the changes in this new years of growth and revolution on manufacturing companies. Now its the fourth industrial revolution or 4.0 and as there is growth in production of products due to demand at higher range and man labor is not sufficient to produce large amount of products at a time . So this is the main reason why each and every manufacturing companies needs robots in their industry because they can work more effectively than a human . For producing goods companies need to do many types of tasks at certain period of time . Main worry is that humans , productivity , quality and these three cannot work simultaneously .

For better product rate one or two things will slow down like production will slow down to reach better quality for human. But this is different in case of robots they complete all the task in given time and in the way we want with the quality goods as we know after-all its a machine whatever we feed in it , it will work like that some commands are sufficient.

The areas where industrial robots are used is: welding components, tool repair, painting, loading and unloading work, assembling, packaging and medical use. Welding is important for joining operations and gives special way for industrial robots, such as programming job, free definition and aim, high repeatability, precision, speed and a variety of other characteristics. Robots are more useful and supportable. For arc welding -In practical industrial applications, today.

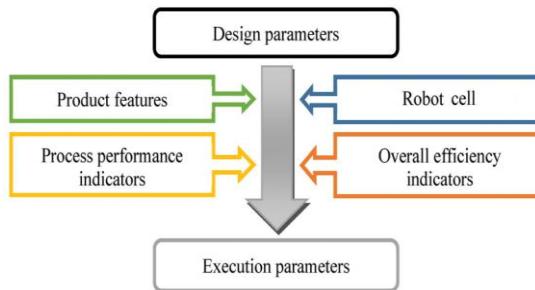


Figure 1. Robot cell Analysis in Industries.

There are two main categories of robotic programming methods which are online programming (including lead-through and walk-through) and offline programming (OLP).

II- DISCUSSION AND ANALYSIS

Many industries have benefited from quick, large, and affordable industrial robots during the last few years. However, direct human-robot communication is still seen unsafe for humans. Also, the common generation of industrial robots is equal with the movement of human labor. In order to develop competitive choices humans and robots should work as a team to gain more open human-robot interaction .



Figure 2. Example of Human Robot interaction.

The concept of an industrial robot helping as a collective and helpful tool for workers is part of recent sample known as "Industry 4.0." This sample shows the coming fourth industrial revolution and "smart factories," where people and robots will work together. The first industrial revolution was automation using water and steam power; the second industrial revolution was mass production using assembly lines and electrical energy. After that, the digital revolution began, and the use of electronics and information technology in manufacturing processes became common. The stage "Industry 4.0" refers to technology and concepts of product value chain company under high amount manufacturing settings.

It shows the motion of a "smart factory" using methods based on the technical idea of cyber-physical systems, IOT (Internet of Things), and IOS (Internet of Services). Due to a lack of study and a lack of usefulness and customer acceptance, robot-based systems are still not commonly used in the industrial industries.

TYPES of ROBOTS used in INDUSTRIES

1)Exoskeletons-These types of robots are used for physical recovery and use the human ability or capacity to carry the heavy loads.



Figure 3. Exoskeletons robot

2)Humanoid-These types of robots are designed to look like people. This is a mechanical look and this also looks like androids series. To build a better carrier for robotics in future humanoids is a common technology.



Figure 4 Humanoid robot

3)Aerospace : These types of robots also include flying robots and the smart robotic seagull and Raven monitoring drone.



Figure 5. Aerospace robot

3)Consumer- The consumer robots are used for fun to help you with any tasks a. This type of robot can be easily available to make a brighter future in robotics because consumer robots will have in huge demand .



Figure 6. Consumer robot

4)Disaster response-These types of robots are used for searching for survivors in the emergency, this type of robot can have the ability to track earthquakes and tsunamis and the nuclear power station.



Figure 7. Responsive robot

5)Drones -This type of robot is called unnamed aerial vehicles. As we all know about drones they can be of different size and used for different purposes.



Figure 8. Drones robot

6)Education-This is the next generation of robotics used in homes and classrooms.

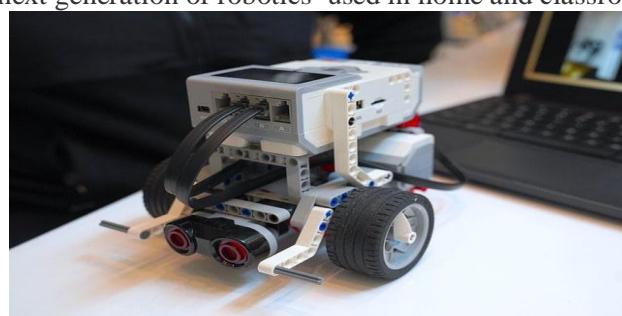


Figure 9. Education robot

TESTING of ROBOTS

Robotics systems are used in places like healthcare, education and transportation. This increase in connection between people and robotics systems vastly increases the chances of catastrophic failure. This heavy risk makes testing of robotic systems an important part of the growth process. It is necessary that Cyber - Physical Systems (CPS) of which robotic systems can be considered a sub-category be fully tested before being used into the production .

The qualities of robotics system such as relation with the outside world and mixture of both hardware and software components separate robotic systems from normal software systems.
The main difference between software systems and robotics system are :-

- 1)Robots are made of hardware , software and physical components
- 2)Robots connect with reality with sensors and actuators and are sensitive to timing changes .
These differences present a lot of problems related to testing of robotic system such as to create heavy idea of physical reality or field testing that can be time consuming .

Tests done by researchers working in field of robotics . The methods of testing told by people are-

- 1)Field testing
- 2)Logging and playback
- 3)Simulation testing
- 4)Plan based testing
- 5)Compliance testing

Out of these methods stimulation is one of the most common used as simulators, stimulates exactly the reality to a high degree do not exist.

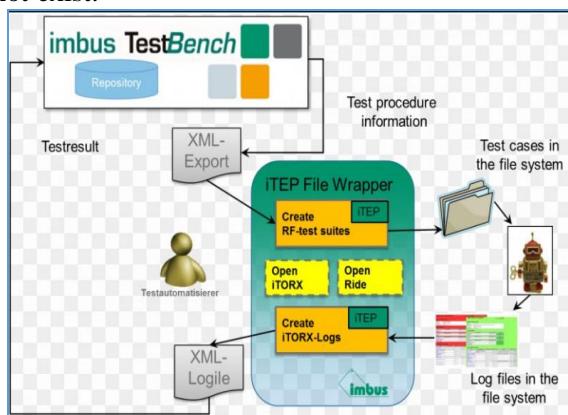


Figure 10. Robot Framework Test Automation Software Framework Information

Test scenarios based on information

Both watchword-driven and information-driven experiments are supported by the robot system. A significant level watchword is used as a framework for the test suite in information-driven testing, and trials are used to impart information to the layout's undeniable level catch. It improves on the most prevalent method of UI testing by incorporating several sources of data.

Test Case Labeling

We can use the robot system to label experiments so that we can run or avoid those that have been named. Labeling comes in handy when we only need to run a subset of trials or skip them entirely.

Reports and Logs:

The Robot system provides all of the information from the test suite and experiment execution as reports and logs. The log record provides all of the details of the experiment's execution. Subtleties, for example, whether the experiment failed or succeeded, the period of time Management in Virtualized CLOUD Data Centers , 10th IEEE/AC International Conference on Cluster, CLOUD, and Grid Computing, 2010, DOI 10.1109/CCGRID.2010.46.

Request for the information technology system's attributes to be modified or retrieved to requests for the attributes of one or more of the relevant CLOUDs to be modified or retrieved.

Connecting at least one CLOUD configured to provide a service to a CLOUD resource management unit is a method of configuring an information technology system. Steps followed to run the test case are provided

TESTING TOOLS:

In this step it is very important for everyone to test the right tools for testing. As both hardware and software tests are to done and right tools need to be used.

Software testing tools

Software testing tools can be done using Visual Studio IDE with the Visual-Micro plug in . This mixture allows to adjust and give an easy way to monitor the output from the micro-controller.

Hardware testing tools

An oscilloscope is used for checking that the signals being sent from the sensors to the micro-controller or reversed are correct. Oscilloscope are an important tool for testing as they are a window into the different place of electronics and a complex system like robot without one .

III- DISCUSSION AND CONCLUSION

In this research we got to know the after the first industrial revolution to the fourth one there are lots of changes happen some were good and some were just ok but the huge game changing thing that happen was when internet and robots came in our life. They not just helped us to reduce time but also helped us to grow more. With the help of robots and human industries can produce goods in a larger amount and also in a limited time .

IV- FUTURE SCOPE

- 1.Increase in production of goods.
- 2.Military and security
3. Medical
4. Education
5. Automobile
6. Automation
7. Space survey

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