

Composition of Agricultural Robotic Technology

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Abstract— The robots are the advanced technology where it is composed of electrical, mechanical engineering and computer science, the robots can be programmed to do multiple jobs in any kind of sector now these robots are turned to do the activities around the field such as the crop cultivation system, maintain the crops from the other destructions. In this system the robot are can fully maintain each and every actions. Flying robots are designed to watch out the crops from the overall view of the field, and some of the autonomous machineries are conceived in this system.

Keywords: Cultivation, Robotics, Autonomous Machineries, Flying Robots.

I.INTRODUCTION:

The agriculture robots are expanded as the agro-robots which are mainly designed for the purpose working in the agricultural fields such as crop cultivation, harvesting crops and complete maintenance around the fields and some of the other system also included in this paper and automated system which could able to maintain all over the agriculture fields. Also many complex tasks are able to solve by this

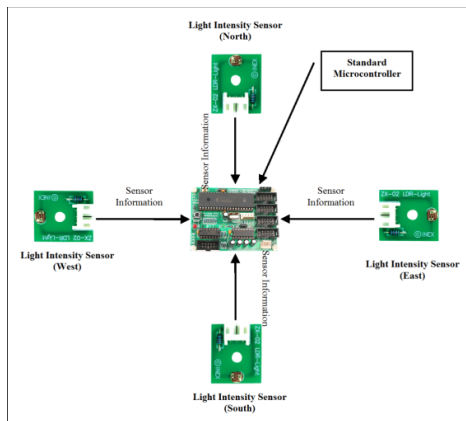
agricultural robots, such as fruit picking, and involving the activities such as sprayer. Well some of the robots are designed for the livestock maintenance purposes such as caring the animals around the farms, collecting milk and checking the health conditions of the livestock animals where these the combined activities that are handled by the agro-robots.

The agro-robots are designed and composed by the various components, such as sensors which could have the ability to analyse the physical quantity around the fields, and other plants and crops in the agricultural lands. Some of the integrated circuits are installed in the robots such as microprocessor which could process all the system in the robots such as sharing of data from one place to the other place. For example the every data collected by the robots are stored in the temporary memory or primary memory later it is forwarded to the main storage through wireless and transferring the storage devices to the main database system where these complexities are reduced in our system.

II.SENSORS & CAMERAS:

Sensors are the system which allows the robot to collect the information around its

environment, there are different kinds of sensors are available in the case of agricultural sector, such as crop sensors, soil sensors and temperature sensors according to our facility we can add the sensors to our robotic system, and camera also one of the vital element for the robots to get the visual representation of the environment which can identify the shape and colour of the surroundings, and additionally microphones are added to the robots which could detect the sound.



1. Light Sensors in Robots

Thus in our system agricultural robotics the necessary sensors are used to analyse the field condition and other activities around the fielding sector, such as cropping sensors are used to analyse the physical quantity such as the crop growing level, infection from insects etc. And temperatures sensors are also attached to climatic changes all over the assigned field so it collects information whether there will be heavy rainfall are to be notified before.

III.EFFECTORS:

Effectors are the parts of the robot that are assigned to do the work where this effectors are attached with the robots to perform the particular task such as other tools which are added with the robots such as drilling and digging tool, where these kinds of tools are attached to the robots and further attachment of this tool is not important and hence it have to be programmed for the particular task so these tools can only perform the committed process, in case of agriculture the robots needs the tools such as drilling and cutting machineries.

The below figure shows that the agricultural robots which is attached with the effectors, where this effectors used to picking up the fruits on the trees in the garden, these activities are to be programmed to analyse each and every struggle which are going to be faced for example such as identifying the trees and finding the fruits and also have to analyse the fruits whether it have the qualities for picking and also damaged fruits have to be collected in separate region.



2. Effectors used for picking fruits

IV. CONTROLLING SYSTEM:

A. Pre-Programmed:

The pre-programmed robots are one of the grade which are programmed in an advanced way where this kinds of robots are used to do the same work again and again in the particular environment, but these robots cannot able to perform well in other environment because it is assigned for the particular job. For example in case of agricultural robots it is designed for the fruit picking process alone & does not able to pick up the plants surrounds the fields, so the robots which are pre-programmed are capable of doing the similar process alone.

Pre-Programmed robots are designed to perform the repeated actions, where it will sustain in the particular environment such that it does able to perform in other environment so while it comes in that case the stored program has to be changed in the robotic technology. This type of robots are suitable for the certain conditions alone, if it does not suitable rather it would moved to the autonomous robots.

B. Autonomous Robots:

The autonomous robots which can operate independently and it can be programmed with multiple options, so it has the capability to do all kinds of task around the fields such as crop maintenance, prevent from infection, and analyse all the capability of the entire crop details of the fields. So the entire robotic architecture has to be designed in the systematic process and complex problems are

also implemented on the autonomous robots. In focus of the agricultural robots it can be build in the two ways known as the top down process & bottom up process. The top down process which has constructed the main process and further effectors are added to the architecture, while in case of the bottom up process the additional parts of the robots are constructed and finally processors are attached later.



3. Autonomous based Agricultural Robots

The above figure shows that the autonomous based agricultural robots where it can manage maximum level of work in the field, such as this autonomous tractor based robots are consists of sensors and tracking system. The sensors used in the robot are analyse the crops in the fields and plants and tracking system are also included in this agricultural robot where it could able to track the distance and path in which has to be proceed are programmed with the successful manner, GPS and other navigation system will also control the robots in the particular way further fuzzy controller and fuzzy logic are also applied for relevant and irrelevant process.

V. AREIAL SYSTEM:

The flying robots are also now a day's important in the agricultural sectors where these robots cannot able to run on the own method as it has to be controlled by the controller by the human as it was flying bots the robots can reach its destination quickly the main aim of designing of flying robots for the agriculture is to quick overview of the entire field and camera are attached with this robots in case of more number of acres are to be watched.



4. Flying robots with Sprayer

The above figure 4 shows the flying robots on the agricultural lands which consist of sprayer attached so that the flying robot is designed with the taking captured image of the land as well as the spraying techniques are also added in this technology. So that the helicopter based robots will reach the assumed place quickly and can able to spray easily, but it is not successful in the manual process. Also the sensor also placed in the robots which have to analyse the crops that need more minerals nutrients or less occasionally the copter will reach the location through air.

VII. ADVANCED MACHINERIES:

The advanced machineries of the agricultural system are assembled with the some of the other technologies such as the machine that needs no driver and various properties can be added in the machineries system where the tractor which can make the land for the suitable agriculture and sustainable process.



5. Autonomous Tractor

Where by introducing in our agricultural farm it will become the fully automated process, such that it could have the capability to do all the stuff work in the farm by the help of technologies where these kind of technology will reduce the human power in the agriculture sector.

VIII. CONCLUSION:

Thus the agricultural robots consists of all kinds of advanced technologies camera and sensors to identify the objects, effectors system which could be do the multiple work around the field and other system such as flying robots and autonomous tractor system will reduce the complete burden of the human in the agricultural sector thus the agricultural robotics technology are analysed.

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