Android Based Instinctive Nutrition Add-on & Intensive Care for Smart E-Agriculture

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***Abstract*: - Robot manipulator is an essential motion subsystem component of robotic system for positioning, orientating object so that robot can perform useful task The main aimof our work is to collaborate the gripper mechanism and vacuum sucker mechanism working in a single pick and place robotic arm. This robot can be self operational in controlling, stating with simple tasks such as gripping, sucking, lifting, placing and releasing in a single robotic arm. The main focus of our work is to design the robotic arm for the above-mentioned purpose. Robotic arm consists of revolute joints that allowed angular movement between adjacent joint. Three double acting cylinders were used to actuate the arm of the robot. Robot manipulators are designed to execute required movements. By using this collaborated mechanism, the success rate of pick and place robots are increased**

INTRODUCTION:

Robotic arm (also referred to as robotic manipulator) are mainly used to carry out highly repetitive, material handling and precision tasks such as spot welding, assembling, cutting, palletizing, spray painting etc. in manufacturing industries. It is a programmable device with similar attributes to that of a human arm and is best suited to hazardous environments where human intervention is highly undesirable. The main advantages include high quality of work, more repeatability, time saving, less material wastage and no fatigue. In recent years, major advancements in the field of robotics led its usage in numerous fields namely health care where it is used for executing complex surgical procedures, rehabilitation, prosthetics etc. Electromechanical robot arms were mainly dominant because they exhibit linear characteristics and hence easy to control. Despite of several advantages, electromechanical robot arms are still restricted to its work-cell because of its high stiffness and inability to work safely in a robothuman environment. Alsoit consumes a lot of power for its operation, has poor strength to weight ratio, bulky structure and requires high maintenance. This demanded robots implementing different drive technologies and hence pneumatic robot arm emerged

LITERATURE SURVEY:

System that uses compressed air as its main source of energy is termed pneumatic systems. Systems are of lower cost than hydraulic and Pneumatic driven electromechanical systems and perform well in carrying out arduous work. Advantages of pneumatically actuated systems are mainly increased level of safety, cleanliness, variable load carrying capacity, simple configuration, minimum pollution, reliable, storage capability, high strength to weight ratio, ease of maintenance, high speed and fast transmission. The system is better at working in hazardous environment where explosions are likely; industries where it is highly suitable are mining, chemical, petroleum and painting industries.

(i)

ROBOT CLASSIFICATION

An industrial robot is a complex and technical system whichconsists of multiple subsystems and always works within a specified robotic workspace These subsystems individually add up to the total working of the industrial robot andperform all the carefully defined functions on its own. The three of the more important subsystems comprises of (i) the robotic control system (ii) kinematics of the robot (iii) the

Kinematics:

The word Kinematics here specifies to the spatial arrangement, relating to the sequence and structure of different movement axes which are in relation to each other. An industrial robot may have four basic types of movement which are as follows: (i) Cartesian, (ii) Cylindrical, (iii) Polarand (iv) Jointed-

Cartesian Co-Ordinate type Robot: It is a kind of robotwhich has a column and another part called arm. It is also sometimes called an x-y-z robot, where x-y-z indicates the different axes along which the robot can move. The lateral motion is generally along x-axis, longitudinal motion occurs along y-axis, and vertical motion along z-axis. Thus the arm has the freedom to move up and down along z-axis; the armhas the power to slide along its base on the x-axis; and then it can oscillate to move to and fro along the work area on they-axis. This type of robot was developed mainly for arc welding purposes, but it is also suited for many other assembly and industrial operations. the image given is affected image, then an automatic pesticide sprayer is involved to spray the pesticide to the localized area in the leaf. If not processor will automatic discard it and the robot.

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ii) Cylindrical Co-Ordinate type Robot: It is one of the variations of the Cartesian robot. Such type of robot has a part called base and other one called column, where the column is able to rotate about any radius. It also carries an extending arm which has the freedom to move up and down on the column anytime to provide more freedom of movement for the system. The cylindrical co-ordinate robot is mainly designed for handling different machine tools and assembly structures.

(iii) Polar Co-Ordinate type Robot: It is also called the spherical co-ordinate robot which consists of a part called rotary base, the second part known as elevation pivot, and the third one called extend-and-retract boom telescopeaxis. These robots has the feature to work based on the spherical co-ordinates and thus has much higher flexible working application. The primary applications of such type of robots are found particularly in spot welding.

Jointed-Arm type Robot: It resembles a type of human arm. It usually stands erect on a part called base. While it can move along the "shoulder" joint, just above the base, it has also the freedom to rotate on the base. The robot also has the freedom of movement to rotate about its "elbow" and "wrist" joints. Along with the inclining and bending at the wrist, generally 6 degrees of freedom is obtained fromthis type of robot. This type of robot is the most popular form of a robot and has various applications in welding and painting workiations of the Cartesian robot. Such type of robot has a part called base and other one called column, where the column is able to rotate about any radius. It also carries an extending arm which has the freedom to move up and down on the column anytime to provide more freedom of movement for the system. The cylindrical co- ordinate robot is mainly designed for handling different machine tools and assembly structures

2 Different Types of Control Systems:

Control system-The point-to-point type and Control system-The continuous path.

(1) Point-to-point control system:

With this control system, the robot stores the point whereit has to pick up a part and the desired point where it is required to release that part in the space. It then calculatesthe best path to traverse between the two points which it is required to follow later. This type of control system is used when initial and final points only matter and are always repeatable. This control systems work well where loading and unloading applications is carried out.

(2) Continuous Path Control System: This control system is one in where the robot can be programmed beforehand to follow a path which is irregular type. In this control system, the path to be traversed by the robot is represented by a series of large number of points in close proximity with each other; which are then stored in the memory space of the robot. When the robot is made to work, it exactly follows the samepath as it had stored the corresponding co-ordinates Drive The drive of the robot maintains the function to change the supplied power to the grippers into usable kinetic energy for moving the robot and its positioning. The different types of drives are ➢ Electrical ➢ Hydraulic ➢ Pneumatic

Electrical Drive: Electromechanical drive systems are found in about 20 percent of robots in today's world. These systems are of different types including servo stepper pulse motors. Electrical energy is converted into mechanical energy in these motors to power the robot for various applications.

Pneumatic Drive: Pneumatic drive systems are approximately found in about 30 percent of robots in today's world. Pneumatic drives use compressed air to propel the robots for various applications. The pneumatically driven robot is very popular these 8 days for most of the machine shops have compressed air lines in their working areas.

Actually, for difficulty in control of either speed or positionor both which are the essential ingredients for any successful robot, this system is used selectively.

AUTOMATION IN INDUSTRY:

Automation is termed as use of different control systems such as numerical control, programmable logic control or other industrial control systems in concern with computer applications or information technology (such as Computer Aided Design or Computer Aided Machining) to manipulate all the industrial machinery and processes, thus reducing the need for human intervention. As always said, for growth of industries, automation is must and should supersede the mechanical growth. Where mechanization provides human operators with machinery to assist them along with the muscular requirements of work, automation decreases the involvement for human sensory and mental requirements as well. Automation plays a dominant role in the world economy these days and in daily application in industries. As for these days, the twenty first century engineers are increasing their research to combine automation with mathematical and organizational systems to facilitate new complex systems which has wide applications.

Automated manufacturing:

Automated manufacturing mainly symbolizes to the use of automation to reproduce things usually obtained in a factory. The automation technology has many advantages and thus itinfluence in the manufacturing and production processes. The main advantages of the automated manufacturing are higher consistency and quality, reduced lead times, simplification of production process, reduced man handling & improved work.

Home Automation:

It is also termed asdomotics which represents a practice ofincreased use in household automated appliances and residential complexes, where electronic things are

used to solve practically non-feasible things, which were largely expensive or not possible earlier by any means.

Advantages of Automation:

These days human operators are being replaced in many tasks that involve hard physical, strenuous or monotonous work. Replacing humans in certain tasks that is required tobe carried in non-safe conditions which includes heat or fire, space outside atmosphere, volcanic eruptions, nuclear reactors, underwater in sea or ocean, etc) Undertaking jobs which are difficult to perform by human beings like carrying heavy loads, transporting bigger objects, workingwith too hot or too cold objects or something like performing a work with high pace or utmost slowness. Economy improvement is one of the major advantages of the automation system. Sometimes some kinds of automation system imply improvement in economy of firms, enterprises or society. Examples may be taken, an enterprise recovering its total investment which it had incurred on a automated technology, when a state adds up to its income due to automation like Germany or Japan as in the 20th Century or when the humankind

ROBOTICS :

Roboticsis a branch in science and Engineering of robot making which deals with design, development, manufacturing, application and real time use in day today‘s world. It is related to three branches mainly which are mechanics, electronics and software development.

Grippers:

These are the type of robots which have the capability to grasp definite objects and then reposition it according to requirement. The robotic grippers have two basic parts. They are the manipulators and end effectors. The manipulators are the working arm of the robot whereas theEnd effectors are the hands of the robot. Generally the robots are connected with replaceable end effectors for which they can perform wide range of functions with same fixed manipulators. The end effectors are actuated by various mechanisms which include mechanical drives, electrical drives, hydraulic drives and Pneumatic drives.

Among this the widely used one is the hydraulic grippers but the most favorable one is the pneumatic gripper on which this paper is based onThe advantage of this arrangement is that the spring action would accommodate different sized parts. Most mechanical drives used in grippers are based on cam and followers or rack and pinion gears as force convertors. Cam driven gripper jaws normally enjoy a relatively large stroke not normally achievable with other gear types. As a prime mover almostany form of electrically commutate

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