ISSN: 0975-766X
CODEN: IJPTFI
Available Online through
www.ijptonline.com
Research Article

AUTOMATED PARAQUAT SPRAYER

H.Saravanan, S.Prem Kumar
Electronics and Communication Engineering Assistant Professor
Saveetha School of Engineering ECE Department, Saveetha University, Chennai.
Email: sara.krishna05@gmail.com

Received on: 15.08.2016 *Accepted on: 20.09.2016*

Abstract

Agricultural projects have become latest trend in order to reduce manpower and to improve the crop yield. Automatic mechanical devices are needed for watering, harvesting, removing weeds etc. And in-order to protect plants from contagion and to grow healthy crop paraquat is sprayed on crops manually by human beings. And this process of spraying paraquat leads to severe issues as wastage of paraquat, contaminates air causing pollution, human being inhaling leads to inability to breath or increased rate of breathing, kidney problems and sometimes to death. In this project we are going to design an automated paraquat sprayer using Infra-red sensors. So the crops are been spotted and then the paraquat is sprayed on the crop.

Introduction

Paraquat chloride might be a wide utilized and to a great degree hepatotoxic weed executioner. it's a wide range (non-particular) contact weed executioner and a vigorous drying operator. Herbicide is the third most for the most part utilized weed executioner inside the world. It is utilized to control deciduous weeds and grasses, amid a wide determination of farming applications and for general weed control; it's less compelling on profound stock-still plants. herbicide is increasingly used to obliterate weeds in getting prepared area for planting together with no-till farming practices that minimize furrowing, so the weed executioner is wide advanced for no-till and least till horticulture use. herbicide is industrially created and sold as chloride salt and available as dimethyl sulfate yet. The cutting edge in float lessening innovation frameworks intends to advance the harmony amongst float and adequacy. These frameworks figure a site particular ongoing float evaluation, advising the implement of the potential for float. Decrease advancements can then be executed on a ―as-needed‖ premise instead of being communicated for a field all in all. Sprayer position and climate conditions, which are always showing signs of change for a splashing occasion, drive the requirement for execution of float lessening methods. At the point when float is not a worry,

splashing procedures can be moved to expand adequacy. Currently, the decision maker and instigator for balancing drift and efficacy is the applicator himself. While computer programs have been developed to aid in this decision making process, ultimately changes in application are left in the subjective mind and hands of the applicator. With highly variable in-field conditions and the complex nature of drift, few applicators are able to judge the potential for drift, let alone modify application techniques on the go. This project aims to develop a scientific basis for automated, real-time nozzle selection to optimize the balance between drift and efficacy. Accompanying this development is the design, implementation, and testing of a prototype nozzle selection controller founded upon the derived scientific principles.

Objective:

Drift regulations in the United States are becoming more restrictive, with proposals in-place which once passed will implement regulations similar to those seen in Europe. Increased regulatory control will bring with it new challenges to create advanced drift reduction systems similar to those beginning to be developed in New Zealand and Europe. The most popular, straightforward approach to drift reduction is through the selection of larger droplet producing nozzles. State-of-the-art in spray drift reduction systems monitor real-time weather conditions and present predicted drift levels to the operator allowing for adjustment of operating parameters or to determine go/no- go decisions. While these system are excellent management tools, their endpoints are merely raw decision making inputs, thus their desired goal is left in the pre-occupied, subjective minds of applicators. A logical next step in drift control is the development of an automated system which predicts drift real-time and changes nozzles according to scientifically based criteria.

For the development of such a system, research is needed to generate a basis for the nozzle selection process, specifically the underlying real-time prediction model and method of protecting sensitive areas. Research into the basis for such decision making processes would provide a significant step in drift control methods in the United States in preparation of inevitable, increased regulation.

Literature Survey

Solar e-Bot for Agriculture:

Sun oriented fueled e-bot for agribusiness implies straightforward eco-accommodating Agricultural Robot. E-bot for horticulture is a robot which keeps running on sun oriented vitality. It is a 4 wheeled unmanned vehicle which can move in a straight bearing. Every one of the units (Weed remover, Fertilizer Sprayer and Pest controller) work

autonomously. The robot utilizes portable application frameworks and a scope of mechanical perspectives to manage the robot along the lines and play out the assignments precisely. The robot has been worked by Manual control furthermore be utilized as robotized machine requiring little to no effort. The manual control of the robot is accomplished by Wireless Remote (RF sort) which can be utilized for long range up to 15metres and the way of the robot is transmitted energetic utilizing remote camera. From the video, rancher can break down the influenced plants and the additional consideration can be executed in the field which totally takes a shot at sunlight based force.

Implementation of image processing in real time vision for automatic weeding strategy:

A weed can be considered as any plant developing in the wrong place at the wrong time and accomplishing more mischief than great. Weeds contend with the harvest for water, light, supplements and space, and in this way decrease crop yields furthermore influence the effective utilization of apparatus. The most generally utilized technique for weed control is to utilize rural chemicals (herbicides and manure items). This overwhelming dependence on chemicals raises numerous natural and financial concerns, creating numerous ranchers to look for choices for weed control so as to decrease compound use in cultivating. Since hand work is excessive, a mechanized weed control framework might be financially attainable. A continuous exactness computerized weed control framework could likewise decrease or take out the requirement for chemicals. In this examination, a smart continuous programmed weed control framework utilizing picture preparing has been created to distinguish and segregate the weed sorts in particular as limited and wide. The center segment of vision innovation is the picture handling to perceive sort of weeds. Two procedures of picture handling, GLCM and FFT have been utilized and contrasted with locate the best arrangement of weed acknowledgment for order. The created machine vision framework comprises of a mechanical structure which incorporates a sprayer, a Logitech web-advanced camera, 12v engine combined with a pump framework and a little size CPU as a processor. Disconnected pictures and recorded video has been tried to the framework and order aftereffect of weed demonstrates the effective rate is above 80%.

Remote Sensor Comparison for Crop Area Estimation:

It give another approach on stratified testing method. Amid the stratification technique, physical elements, for example, temperature, precipitation, soil sort, sun eradiation was considered and in addition extents of fundamental product sorts. And after that, we first gauge crop extent utilizing group inspecting helped by remotely detected pictures. Also, we appraise crop sort extents of various product sorts utilizing transect testing and GVG review framework. Here, transect testing is a two-phase examining truth be told. In the initial step, PSUs were chosen

haphazardly from a 4KM * 4KM zone outline. What's more, in the second stage, street portions were chosen to review crop sort extents. Finally, trim region was figured under the backing of current 100,000-scaled area asset database. What's more, a contextual investigation of early rice territory estimation in 2003 demonstrated this technique was productive and precision enough to meet the running of CCWS.

Case Study on Paraquat in Downscaling Pesticides on Crops:

Presentation to pesticides has been connected with expanded danger of numerous antagonistic wellbeing impacts. To comprehend the connections between pesticide introduction and wellbeing results, disease transmission specialists need data on where pesticides are connected in the earth. California keeps up a standout amongst the most far reaching pesticide use reporting frameworks on the planet, yet the information are just recorded at a coarse geographic size of roughly 2.6 km2 range. A technique is exhibited that utilizations Landsat picture time arrangement to downscale California pesticide use information to the yield field-level. The methodology is shown utilizing paraquat connected to vineyard and cotton fields.

Introduction

This anticipate is gone for outlining a PARAQUAT sprayer which diminishes the mutilation in products and trees. A circuit has been composed where the microcontroller is associated with the three transfers and the driver-IC (ULN2803A). This circuit is controlled by a remote where the order is gotten by the TSOP1730 which is associated with the pin (collector pin) of the microcontroller. The microcontroller gets the order and empowers the hand-off which is associated with the machine to turn it on/off.

Implementation

This part depicts about the prerequisite investigation as per the assets utilized. It additionally portrays the usage of the venture with the instrument utilized.

Requirement Analysis

It decides the necessities of another framework and break down on item and asset prerequisite, which is required for the fruitful framework. The item prerequisite incorporates info and yield necessities it gives the needs in term of contribution to create the required yield. The asset prerequisites characterize to sum things up about the product and equipment that are expected to accomplish the required usefulness.

Hardware Requirement

- Micro Controller (ATMEL89C2051)

- UTC LM78XX
- Relay
- TSOP1730
- ULN2803A

Software Requirement

- Operating System: Android version 2.0 and above.
- Embedded C Language.
- HI-TECH C(compiler)
- MPLAB IDE v8.43
- ECLIPSE (android software development)

Working Principle In this we describe the working principle of our project. The microcontroller is programmed using embedded. An automatic paraquat sprayer is developed and used in agriculture. The circuit is provided with a power supply.

Function-1

An automatic paraquat sprayer is developed and used in agriculture. The user uses this application to operate the circuit. Once the user starts the circuit the sprayer automatically gets enabled and starts to detect the trees around.

Function-2

The sensors are connected to the circuit receives the command and forwards it to the microcontroller. The microcontroller receives the command and directs it to the relay via ULN2803a.

Function-3

One pin of the relay is connected to the battery supply (15V) and the other pin is connected to the appliance. When the command is received by the relay it enables the appliance will react according to the command. Meanwhile the circuit will sense the tree with the help of sensors both in the tree as well as the circuit and the process is successful.

Results and Analysis

Output scenario

This is the general circuit presentation of the task. This anticipate "Computerized PARAQUAT SPRAYER" is utilized to splash the pesticides in the agrarian fields. The sensor associated with the circuit (applaiance) detects the trees where another sensor is put in it and splashes the pesticides through the sprayer.

References

1. Jeffrey Nichols Carnegie Mellon University, P., PA, et al. Generating remote control interfaces for complex appliances. In proceeding UIST '02 Proceeding of the 15th annual ACM symposium on user interface software and technology 2002. New York, NY, USA.
2. Shirehjini, A.A.N., A novel interaction metaphor for personal environment control: direct manipulation of physical environment based on 3D visualization. 2004. 28(5): p. 667-675.
3. Choonhwa Lee, S.H., and Wonjun Lee, Universal interactions with smart spaces in Pervasive Computing, IEEE 2006 p. 16 – 21.
4. Jukka Riekkil, I.S., and Mikko Pyykkonen2. Universal Remote Control for the Smart World. In UIC '08 Proceeding of the 5th international conference on Ubiquitous Intelligence and Computing 2008.Berlin, Heildelberg : Springer-Verlag Berlin, Heidelberg 2008.
5. Hsien-chao Huang, T.-C.L., and Yueh-Min Huang, A Smart Universal Remote Control based on Audio-Visual Device Virtualization .Institute of Eiectrical and Electronic Engineers,2009.55:p. 172-178.
6. Laehyun Kim, W.P., Hyunchul Cho and Sehyung Park, A Universal Remote Control with Haptic Interface for Customer Electronic Devices, in IEEE Transactions on Consumer Electronics 2010. P. 913-918.
7. Hyoseok Yoon, W.W., Design and Implementation of a Universal appliances Controller based on Selective Interaction Modes. Consumer Electronics, IEEE Transactions on November 2008 54(4): p. 1722-1729.
8. Blackmore, B. S., Fountas, S., Vougioukas, S., Tang, L., Sorensen, C. G., and Jorgensen, R. 2004b, Decomposition of agricultural tasks into robotic behaviors, The CIGR Journal of AE Scientific Research and Development in Press: Chamen, W. C. T., Dowler, D., Leede, P. R., and Longstaff, D. J. 1994.