International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 06 | June 2020 www.irjet.net p-ISSN: 2395-0072

APP CONTROLLED CYBERNETICS WEED HOEING AGRIBOT USING IOT

Dr.P.T. Kalaivaani [1], N. Priyadharshni[2], R. Swarna Lakshmi[3], A. Sheemarani[4], S.R. Vaisali[5]

[1]Professor, [2,3,4,5]UG Student, Dept. of Electronics & Communication Engineering, Vivekanandha College of Technology for Women, Namakkal, Tamil Nadu, India.

ABSTRACT: Numerous advances in innovation have made the agribusiness business a considerably less work escalated industry. Ranchers are searching for better approaches to actualize innovation to reduce expenses and diminish work hours. One of the manners in which that ranchers are starting to investigate new advancements in cultivating originate from the programmed machines. Web of Things (IOT) innovation has carried insurgency to every single field of basic man's life by making everything savvy and shrewd. IOT alludes to a system of things which make a self-arranging system. The Agriculture stick being proposed by means of this paper is coordinated with Adriano Technology, here we utilize two applications to show the working of the robot which will do edit reaping and preparing progressively way. Different adornments are slaves performing explicit activities. The methodology is presently to create more brilliant machines that are sufficiently smart to work in an unmodified or semi-indigenous habitat.

Keywords - ***IOT, ROBOT, CAMERA & HOEING***

1. INTRODCTION

The programmed cultivating robot is something that is new to the farming business yet is rapidly picking up notoriety from horticulture look into. This programmed agrobot are quickly getting to a greater extent a reality than a thought. When the agrobot is proceeding onward a surface, it is constrained by Arduino Uno. This can be pushed ahead and turn around bearing utilizing a dc engine of 60RPM. The robot can move towards the left and right bearings utilizing these engines. This undertaking utilizes Arduino Microcontroller and includes performing crop reaping and preparing by means of Arduino decoder orders. This robot is additionally interfaced with the ultrasonic sensors. Ultrasonic sensor will distinguish the deterrents before the robot and signal will be ON. The robot has a watering system it will splash the plants as indicated by their requirements by compost. The dc siphon encourages the robot to sprinkle the water for the preparing procedure. This undertaking utilizes a 12Vrechargeablebattery and supplements the LCD show for investigating the entire instrument obviously. Additionally, vitality requires for this machine is less as contrasted and yield shaper or any farming instrument.

In this paper a way to deal with structure a calculation in Image Processing has been created to distinguish the weeds with their situations in the picture caught by the camera and procedure in MATLAB and obliterate them utilizing Herbicides sprayer to deal with the weeds in the farming field. Numerous strategies are accessible to recognize weeds and separate them from crops yet in this paper Morphological size based element like zone recognition has been utilized. Wavelet Transform Db4 (Daubechies 4) has been utilized for picture pressure

2. OBJECTIVE

The objective is to enabling the weed detection robot to navigate autonomously between the inter-row spaces of crop for automatic weed control, reduce labor cost and time. The vision guidance system use model based approach and series of image processing techniques that are not only computationally inexpensive, it also provide robust detection and tracking of the inter-row spaces. The main components of the develop vision system are the modified parameterized Hough transform and the dynamic model.

3. LITERATURE SURVEY

Biological Morphology Based Technique: In biological morphology based technique shape and size features are extracted. Features like major axis, areas, minor axis, aspect ratio, width, etc. are used for detection of plants. Hidden features are also found with the help of biological morphology based technique. Hong Y. Jeon Lei F. Tian [8] used the excessive green colour algorithm for segmentation of soil and vegetation. Median filtering was used for removing the noise. Other morphological features were analysed and calculation of statistical threshold value was done. Using this, they got 72.6% of precision

Plant Reflectance Based Technique: Spectral reflectance technique for identification of different plant species is used [7]. Spectrometer is required to record spectral reflectance parameter and characteristics. But cost is higher than the farmer can afford to buy. Plant reflectance is governed by leaf surface properties and internal structure, as well as by the concentration and distribution of biochemical components. Thus remote analysis of reflected light can be used to assess both the

biomass and the physiological status of a plant. The features like, variance of the near infrared spectrum, skewness, average gives the high level of accuracy in colour segmentation and detection.source simulation consisting of all the necessary modules to build the authentication system. This system is built using Java and Oracle 10g Express Edition as the database although most database systems can be used.

Visual Texture Based Technique:

This technique includes texture features such as, energy, entropy, contrast, homogeneity and inertia for detection of plant species A leaf is represented by a pair of local feature histograms, one computed from the leaf interior, the other from the border. Describing the leaf with multi-scale histograms of rotationally invariant features provides a desirable level of invariance which is used for identification of plants. Wavelet Transform Db4 for extracting the texture features of crop and weed images can be used including image compression.

4. METHODOLOGY

4.1 Image Acquisition:

Digital camera (Web Camera) is used for capturing the part of the agricultural field. The captured coloured image is stored in JPG format. While capturing the images camerais faced towards the ground. Images are captured in the natural sun light condition. Captured images are processed with MATLAB software. The original captured image is as shown in figure 1 consisting of crops and weeds.

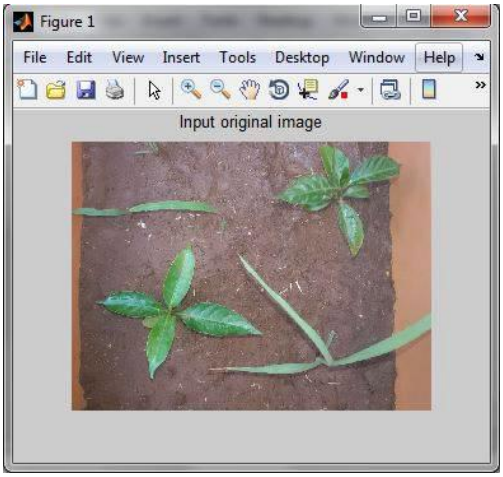

Fig 1: Image Acquisition

4.2 Excessive GreenColour Detection:

In excessive green colour algorithm soil is removed from the image and only green colour information remains in the image. Here, segmentation of green colour is performed.

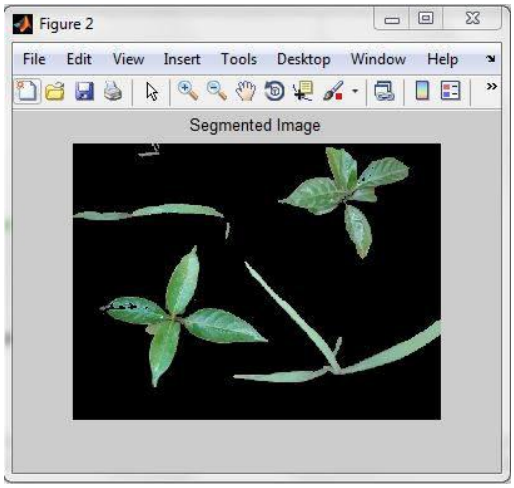

Fig 2: Segmentation Image

4.3 Image Enhancement:

Coloured image is converted into greyscale image i. e RGB to gray conversion is performed. After that noise (salt and pepper) in the greyscale image is removed by using the median filter. Then Intensity is adjusted and the image is converted into a binary image as shown in figure 3

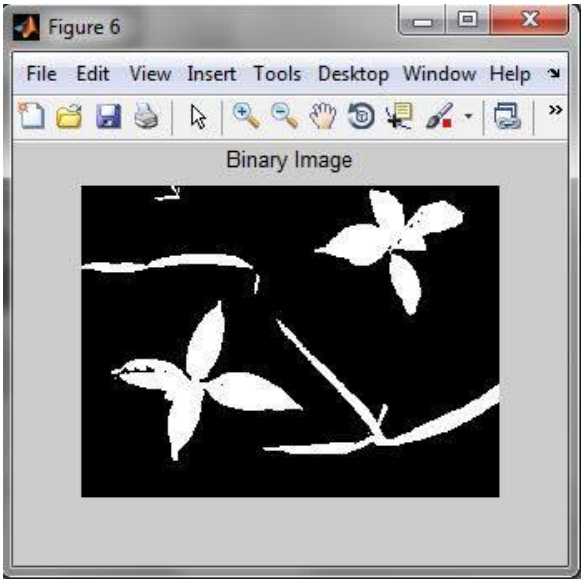

Fig 3: Binary Image

4.4 Wavelet Transform:

Wavelet Transform is used for a multi-resolution analysis. Wavelet Transform has advantage over a Fourier Transform. In the proposed system Discrete Wavelet Transform is used for compression. Here, Db4 (Daubechies 4) is used to extract approximation, horizontal, vertical and diagonal coefficients as shown in figure4 respectively of the image out of which approximation coefficients are used.

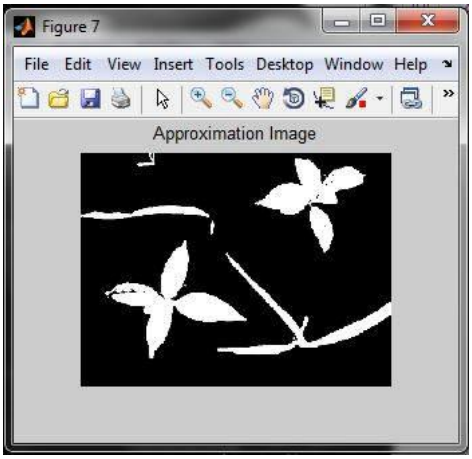

Fig 4: Approximation coefficient image

4.5. Differentiating crops and weeds:

In our proposed system we have considered common garden weeds with narrow leaves and crops with the big and broad leaves as shown in the figure 1. Crops can be of Colocasia, Sunflower, Soyabean, Mung Bean plants, etc. depending on the farmer and the agricultural field. Median filtering is used to remove the small white binary dots in the binary weeds image. These small white dots are not weeds in real. To reduce more computations, they are removed using median filtering.

The web camera captures the coloured image of the part of the agricultural field and passes it further to the MATLAB software to perform Image Processing. After differentiating crops and weeds in the image the XY centroid positions of the weeds are calculated in MATLAB.

5. BLOCK DIAGRAM

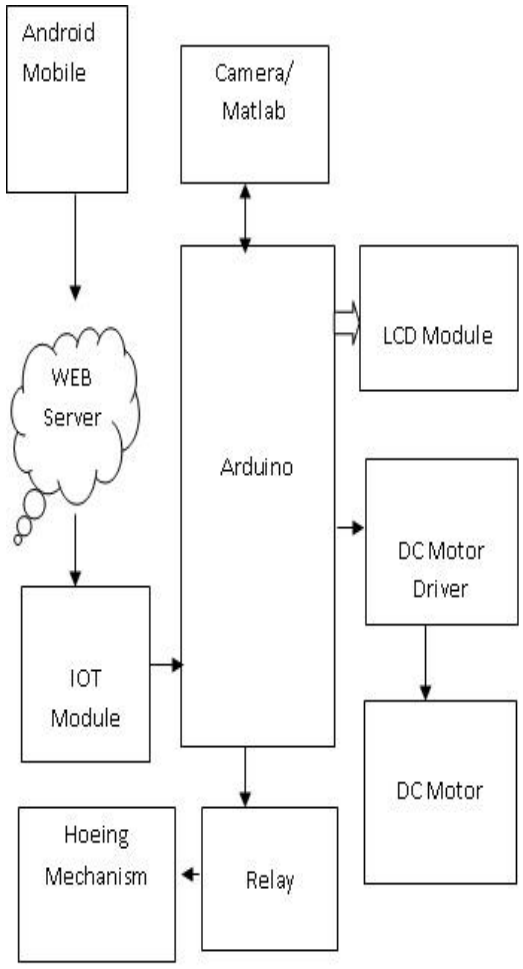

Fig 5: Block Diagram

6. ADVANTAGES

- Agricultural robots are capable of collecting crops and soil samples.
- They are also capable of mowing, spraying pesticides, and performing weeding mechanisms.
- These sensors are used to spray only the affected areas by the parasites instead of the entire crop.
- By spraying only on affected areas, we prevent disease without harming.

7. CONCLUSION

In our proposed system, an approach has been made to help farmers to reduce labour cost and improve productivity by creating an algorithm in Image Processing. After segmenting green information from the image, it is processed and enhanced further for better results in computation. Wavelet transform Db4 has been

used to compress the image and approximation coefficients from the four (approximation, horizontal, vertical and diagonal coefficients) has been used for further processing. Crops and weeds are differentiated based on the morphological size based technique. After testing 15 samples, 12 samples gave proper results. The crops are masked in the image. BLYNK IOT app is used for moving the robot.

8. REFERENCES

1. Amruta A. Aware, Kavita Joshi, "Crop and Weed Detection Based on Texture and Size Features and Automatic Spraying of Herbicides, International Journal of Advanced Research in Computer Science and Software Engineering,", Volume 6, Issue 1, January 2016.

2. Dr. Pusphavalli M, ChandralekaR, "Automatic Weed Removal System using Machine vision", International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 5, Issue 3, March 2016.

3. D. Ashok Kumar, P. Prema, "A Study on Weed Discrimination through Wavelet Transform, Texture Feature Extraction and Classification", International Journal of Computer Science & Information Technology (IJCSIT) Vol 7, No 3, June 2015.

4. Hong Y. J., Lei F. T., Heping Z, "Robust Crop and Weed Segmentation under Uncontrolled Outdoor Illumination, Sensors",11,6270- 6283,2011.

5. Sajad Kiani1, Zohreh Azimifar, Saadat Kamgar," Wavelet based Crop Detection and Classification", ICEE 2010, may 11-13, 2010 IEEE.

6. Lanlan W, Youxian W, Xiaoyan D, Hui P, "Identification of Weed/Corn using BP Network based on Wavelet Features and Fractal Dimension", Scientific Research and Essay Vol.4 (11), pp. 1194-1200, 2009.

7. Kamal N. Agrawal, Karan S, Ganesh C. Bora, Dongqing Lin, "Weed Recognition Using Image- Processing Technique Based on Leaf Parameters", Journal of Agricultural Science and Technology 899 908,2012.

8. Tehran, iran, "Automatic Weed Detection System and Smart Herbicide Sprayer Robot for Corn Fields", Proceedings of the 2013 RSI/ISM international conference on robotics and mechatronics, February 13-15, 2013IEEE.

9. Manisha Joshi, Aishwarya Dhage, Tanuja Bhilare, Roshan Acharya, Avishkar Chawla Automatic Weed Detector and Herbicide Sprayer RobotInternational Journal of Innovative Research in Computer and Communication Engineering.