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Deep Learning in Robotics to Remove Ward of Weeds

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Abstract: *Weeds are the problematic unwanted plants in the fields that causes, 33.16% yield loss in food crops, 41.26% in cereals, 31.88% in pulses, 40.82% in oilseeds, 34.23% in fiber crops, and 40.28% in rice crops. The Proposed System helps to optimization the work to yield in rice crop by removing weed that grows along crop, focusing on these issue is important as to yield the crops only with rice crop. This study focus on the issue in rice crop plant which grows along with weed (unwanted plant).New methodology introduced to remove the weed plant that grows with crop by the means of robotics. The image will be captured through drone in the field and the same frame co-ordinate forwarded to robotic designed with agriculture drone sensor which is coded using python to predict the accurate weed plant for statistical prediction. The robot locate the plant after comparing with the captured co-ordinates of drone with its own captured image and decide to pluck the weed plant grown along with crop.*

Keywords: statistical prediction, weed plant, rice crops, agriculture dron, virtual sensor

I. INTRODUCTION

Weed presents the great potential loss in productivity to crops along with fungi and bacteria. They destroy the native habitats, plants and animals. The Proposed system introduces new methodology to remove the unwanted plants grown with rice crop plants which in turn destroy the neighbor plant crops by getting affected with fungus and bacteria. [1] Rice crops fertile nature Predicted in the delta regions of South India. [2] Extracted feature for a perfect action implementation.[3] The study made using LLC scale and implemented in Multi class SVM with the help of GPS tracter. [4] The study proves the measure of finding the fertility soil for rice crops.[5] The idea behind virtual cluster migration implemented for optimal purpose.[6] A study made to increase the crop fertility with high quality production.[7] The study initiates to increase the crop fertility using natural fertilizers by referring the LCC scale to know the deficiency of the plant.[8] The proposed system explains the pathway to diversity to avoid future threats with weed plant. [9] The study examines five services of eco system to improve the yield and to cut down the weed plant. [10] The study reveals the various measures for sustainable agriculture production. [11] Functionals diversity and ecosystem threats were discussed and remedial measures explained to safeguard proper eco system. [12] The study insightexplains the agro eco services and planting organic growth of vegetables in a productive manner. [13] The study explains the design and managing sustainable food systems and its role in agro diversity in horticultural plant. [14] The new technology of roller-crimper technology implemented on weed management. [15] The paper explains the recent advancements made to remove weed plant. [16] The study explains the change in weed communities using tillage as a driver. [17] The study proves arthropod biodiversity and has lag effects within organic and conventional crop rotations using Soil tillage.

II. METHODOLOGY

2.1 Description of the approach:

Fields are pic-captured using agricultural drone, multiple pics been taken for accuracy.
The pics taken are then computed for several non-average material (color, texture , size).
The co-ordinates of the defaults are then sent to the robot placed exact beneath the drone.
To control robot raspberry pi Model B used to connect the captured image from drone to robotics using monitor by installing raspberry operating system.

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The robot then reaches the spot and plough weeds based on python coding used with the raspberry pi.
Robots works to navigate, detect surroundings using Vision sensors and electromagnet to interact with the object to process the challenges.
Below is the block diagram of the proposed methodology which gives us a brief introduction of the blocks that are used in implementation of the system.

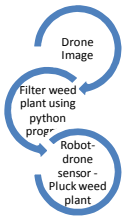

Fig 2.1 The Proposed System

2.2 Implementation

- Special drone made to capture elevation image.
- The images are captured from paddy field at cheyyar village using drone.
- The captured image was sent as input to virtual sensor.
- Drone image forwarded to robot sensor.
- Robot compares the image sensed by it with the output of the statistical prediction and pluck the weed plant that grown with rice crop plant.
- The predicted weed plant was plucked by robot.
- The same prediction gives optimal solution to remove weed plant without removing rice crop plant.

2.3 Making of drone for this project

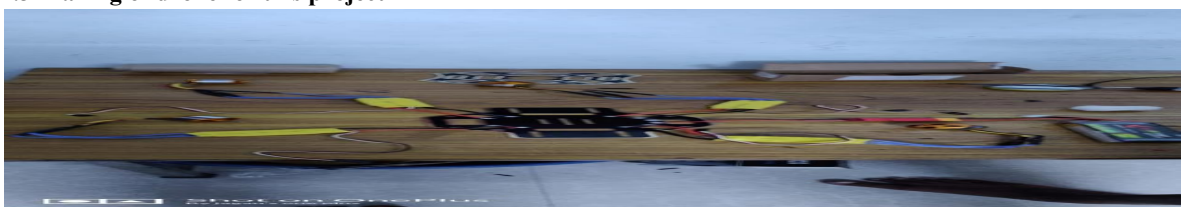

Fig 2.2 Making of Drone

Fig 2.3 Drone

2.4 Robot

- Agricultural robot is normally used to plough plants and soil.
- In our proposed system, this robot works with reverse function.

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Fig 2.4 Plough robot

Fig 2.5 Paddy Field Visit-Cheyyar Village

III. RESULTS AND DISCUSSIONS

The proposed system worked with multiple new technologies like drone and robot to remove the weed plants grow along with paddy which destroy the productivity.

3.1. Include drone image

Fig. 3.1 Image captured through drone

3.2. Images captured with weed plants

Fig. 3.2 Zoom image

3.3. Virtual Sensor

Fig. 3.3 Sensor used in Robot

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3.4. Raspberry Pi (ROS)

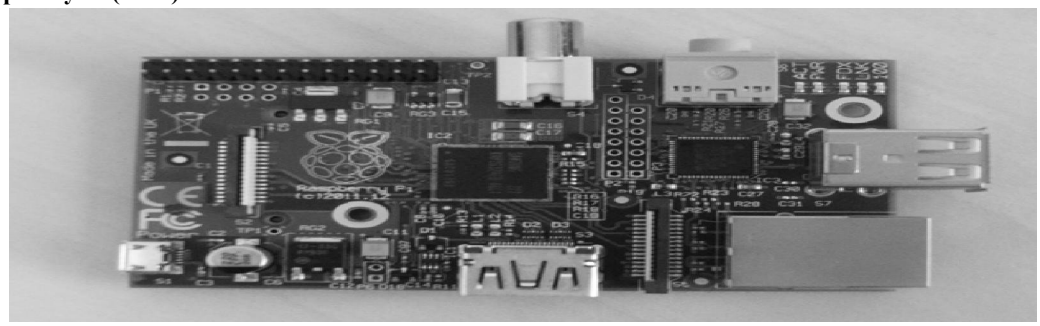

Fig. 3.4 ROS-Device used with sensor

3.5. Predicting weed grown plant – snippet

```
from PIL import Image, ImageDraw
import matplotlib.pyplot as plt
from PIL import Image as PImage
from PIL import ImageFilter
from PIL import Image, ImageEnhance
from scipy import stats
im = Image.open(r'C:\Users\Hp\Desktop\rice.csv')
plt.show()
plt.imshow(im.filter(ImageFilter.FIND_EDGES))
plt.show()
slope, intercept, r, p, std_err = stats.linregress(x, y)
def myfunc(x):
  return slope * x + intercept
```

where x= input - crop plant image
y=output - weed plant.

3.6. Robot

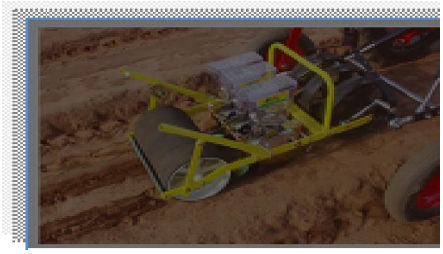

Fig. 3.6 Robot in the field

3.7. Output forwarded to robot sensor

Robot compares the image sensed by it with the output of the statistical prediction and plucks the weed plant that grown with rice crop plant.

3.8. Snippet – Robot

```
if (image1 == "left.png"):
        # Turn left:
        psm.screen.fillBmp(25, 0, 200, 190, path = currentdir+'/'+"left.png")
        psm.BAM1.setSpeed(75)
```

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```
    psm.BAM2.setSpeed(45)
if (image2 == "right.png"):
    # Turn right:
    psm.screen.fillBmp(25, 0, 210, 200, path = currentdir+'/'+"right.png")
    psm.BAM1.setSpeed(60)
    psm.BAM2.setSpeed(75)
if (image3 == "up.png"):
    # Drive forward:
    psm.screen.fillBmp(24, 0, 220, 230, path = currentdir+'/'+"up.png")
    psm.BAM1.setSpeed(55)
    psm.BAM2.setSpeed(55)
```

3.9. Accuracy of the robot

The robot specific movement to the specified location to plough weed plant is measured its accuracy. The same tested in the cheiyyar village-field.

Table 3.1-Accuracy Prediction.

Accuracy	Pos	Neg
Yes	200	50
No	300	250
	P=500	N=300

IV. CONCLUSION

The study predicts effective method to remove the weed plant grown along with rice crop plant in order to work in an optimal solution. The new technology implemented to solve the loss incurred by weed plants. In future the same robot can be used for all types of paddy field to remove the unwanted plant with the rich protein grown crop plants.

REFERENCES

[1].Dr.Savithri.V, Anuradha.G(2015)," A Prediction on the fertile nature of crops In the delta regions of TN, Australian Journal of Basic and Applied Sciences,9(20),pg.559-566.

[2] Dr.V.Savithri and Ms.RasigaBalasubramani, "Object Features Extracted forPerfect Action Implementation" International Journal of Scientific EngineeringandResearch(EUROPE)7(6), pp.808-812.

[3] Savithri. V., Anuradha. G., "Prognosis of Lush In Rice Crops and Nourishing Inadequacy by Exerting Multiclass SVM Through GPS," *International Journal of Computer Sciences and Engineering*, Vol.6, Issue.1, pp.114-119, 2018.

[4] Anuradha G, Aishwarys S.. Savithri.V, "Systematic approach to detect the quality of FERTILE nature in crops", 2014 International Conference on Science Engineering and Management Research, ICSEMR.

[5] Suja, T.L., Savithri, V.Backtracking algorithm for virtual cluster migration in cloud computing
Indian Journal of Science and Technology, 2015, 8(15), IPL040.

[6] Dr.Savithri.V",A brief Study to increase rice fertility in plains,International Journal of /scientific Engineering and Research, volume 6, year 2015, pgs.922-934.

[7] Dr.Savithri.V, "A Prediction on the fertile nature of crops In the delta regions of TN1", Australian Journal of Basic and Applied Sciences,***Volume*** 9, **Year** 2015, **Pages** 559-566.

[8]Tilman, D.; Clark, M.; Williams, D.R.; Kimmel, K.; Polasky, S.; Packer, C. Future threats to biodiversity and pathways to their prevention. *Nature.* 2017, *546*, 73. [Google Scholar] [CrossRef] [PubMed]

[9] Garbach, K.; Milder, J.C.; DeClerck, F.A.; Montenegro de Wit, M.; Driscoll, L.; Gemmill-Herren, B. Examining multi-functionality for crop yield and ecosystem services in five systems of agroecological intensification. *Int. J. Agric. Sustain.* 2017, *15*, 11–28. [Google Scholar] [CrossRef]

[10] Wezel, A.; Casagrande, M.; Celette, F.; Vian, J.F.; Ferrer, A.; Peigné, J. Agroecological practices for sustainable agriculture. A review. *Agron. Sustain. Dev.* 2014, *34*, 1–20. [Google Scholar] [CrossRef][Green Version]

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[11] Wood, S.A.; Karp, D.S.; DeClerck, F.; Kremen, C.; Naeem, S.; Palm, C.A. Functional traits in agriculture: Agrobiodiversity and ecosystem services. *Trends Ecol. Evol.* 2015, *30*, 531–539. [Google Scholar] [CrossRef][Green Version]
[12] Canali, S.; Diacono, M.; Campanelli, G.; Montemurro, F. Organic No-Till with Roller Crimpers: Agro-ecosystem Services and Applications in Organic Mediterranean Vegetable Productions. *Sustain. Agric. Res.* 2015, *4*, 70–79. [Google Scholar] [CrossRef]
[13] Ciaccia, C.; Testani, E.; Roccuzzo, G.; Canali, S. The role of agrobiodiversity in sustainable food systems design and management. In *Genetic Diversity in Horticultural Plants*; Nandwani, D., Ed.; Springer: Cham, Switzerland, 2019; pp. 245–271. [Google Scholar]
[14] Ciaccia, C.; Canali, S.; Campanelli, G.; Testani, E.; Montemurro, F.; Leteo, F.; Delate, K. Effect of roller-crimper technology on weed management in organic zucchini production in a Mediterranean climate zone. *Renew. Agric. Food Syst.* 2016, *31*, 111–121. [Google Scholar] [CrossRef]
[15] Gallandt, E. Weed Management in Organic Farming. In *Recent Advances in Weed Management*; Chauhan, B.S., Mahajan, G., Eds.; Springer: New York, NY, USA, 2014; pp. 63–85. [Google Scholar]
[16] Armengot, L.; Blanco-Moreno, J.M.; Bàrberi, P.; Bocci, G.; Carlesi, S.; Aendekerk, R.; Berner, A.; Celette, F.; Grosse, M.; Huiting, H.; et al. Tillage as a driver of change in weed communities: A functional perspective. *Agric. Ecosyst. Environ.* 2016, *222*, 276–285. [Google Scholar] [CrossRef]
[17] Patterson, E.S.; Sanderson, R.A.; Eyre, M.D. Soil tillage reduces arthropod biodiversity and has lag effects within organic and conventional crop rotations. *J. Appl. Entomol.* 2019, *143*, 430–440. [Google Scholar] [CrossRef]