R-CNN BASED WILD ANIMALS CONSERVATION

Abstract

The main aim of our project is to protect wild animal conservation from electric shock caused in electric fence as well as strengthen the crop protection. RCNN is a type of machine learning model used in computer vision tasks .system is designed used to detect the wild animals in real time basis and raising warning before hitting the electric fence. In this project we use solar infrared motion sensor to function the raising alarm with different sound system. Wild animals disturb near the fencing will get diverted on hearing the sound with flicker flame effect to protect the animals during night time.

Keywords: safe farming, strengthen farming, wild conservation, R-CNN farming

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I. INTRODUCTION

The electric fence system can protect crops of farmers from wild animals but the number count of moralities increases due to electric shock reality of fence use and raises many concerns. This is the challenging problem across the globe.The Modification of fence system to the advanced level will provide the tremendous change in the model presents to protect wild animals.

II. RISK IN ELECTROCUTION

At the point when a suitable electric flow is gone through the body of animal into a state called as ventricular fibrillation. This react to cardiac arrest happen that implies heart beating and immediately end the pumping blood [1]. Wild animal got collapse while touching the fence and become no movement of action, it leads to death. Electrocution affects the life of wild animals .This may be caused by faulty electrical circuit connections, lightning fallen in the electrical line.

Figure 1: Electrocution on distribution power lines

III. ILLEGAL FENCES

Most of the deaths occurred because of shocks coming from broken electric lines. Indeed, even the fences that have been gotten up in a position produce creatures ending their lives. The vast majority of the electric fences are working without the information on Electrical Inspectorate[7]

Figure 2: Illegal Fence identification

Deaths because of electric shock can be forestalled by setting up an electric fence energizer However, without this, highvolt power will be communicated straightforwardly to the fence killing animals. The illegal power fences and set up uninsulated wire perimeters edges around their farm, and charge them utilizing their legal meter connections. Delicate creatures like tigers, bears, and leopards face instant death after coming in contact with them[11,12].

IV. MATERIALS AND METHODS

R-CNN is a network utilized for object identification, that appears to the client as a solitary, start to finish, bound together organization. Faster R-CNN shares computations across all calculations for each proposal independently.[6,7] This is finished by utilizing the new ROI Pooling layer, which makes R-CNN faster .It utilizes a basic back-propagation calculation which is basically the same as max-pooling gradient calculation with the special case that pooling regions overlap and in this way a cell can have gradients drive in from multiple regions.

Step1: camera receive the input signal and it get optimize and pass to the system for detection.

Step2: Object is detected and Vision-Application Programming Interface through the cloud. Identification and classification process based on CNN algorithm.[2]

Step3: System hardware contains an alert option with different sound like 129db dog barking, gunshot, strobe light [3].

Step 4: In Shape Estimation mode will be ready to detect object and task started.[4,5]

Step 5: Next to shape estimation the method is size detection ,it works comparing objects for best matches

Step 6: Finally Evaluation phase that results perfect wild animal detection.

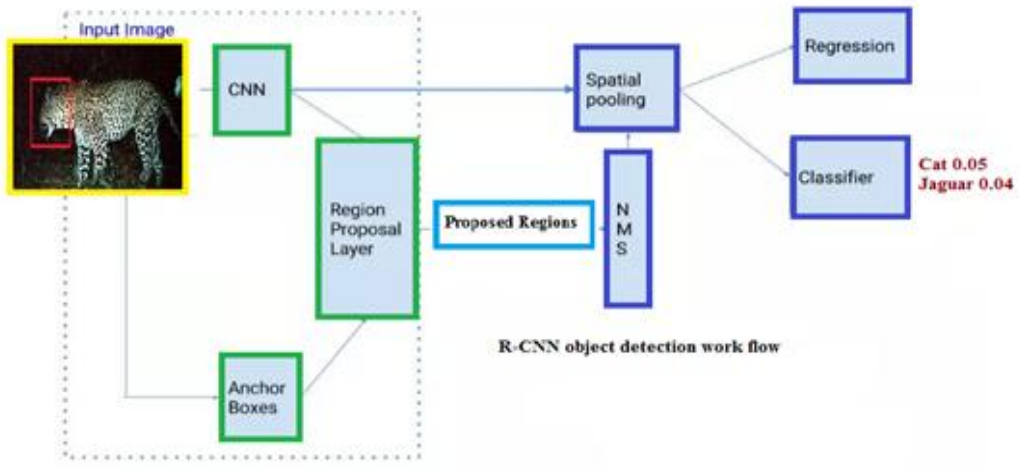

Figure 3: Object Detection (R-CNN) Data Flow diagram of the system

Latest Designed Flickering effect with a Safe alternative as Real Flickering Flames Design [10].The solar post light with automatic photosensitive design including waterproof and heat resistant. Flickering Solar Lights Outdoor having facilities such as Energy saver and Simple disassembly. Robust Glass Material with Shock resistance with Rough Handling and Auto On/off From day to midnight [8,9].

Figure 4: Wild animals detection with alarm warning with flicker flame lights

V. RESULTS

The object detection process is done using R-CNN object detector for computation and major utilization of tensor recognition with addition to vision library. The camera detect object to start proceed the sensor security function the experimental arrangement covers farm with LED fences connected with Arduino.

VI. CONCLUSION

We have presented R-CNN based animal detection and recognition for wild animal conservation . The best way to detect utilization of computer vision systems including deep learning techniques with good accuracy. The project goal is to safe guard the wild animal conservation. The fence is electrified, when any animal approaches the fence the alarm is raised state and image is captured and sent to forest officers, farmers to make alert also wild animals get diverted to various places for finding food.

REFERENCES

[1] Vigneault, C., Benoit, D. L., & McLaughlin, N. B. (1990). Energy aspects of weed electrocution. Reviews of Weed Science, 5, 15-26.
[2] Chandana H C[1], Amruth[1], Akash P S[1], Shilpa K Allurkar[1] Bharath H P[2] ,“Vision Based Animal Detection and Alerting For
[3] Crop Protection ”,2International Journal of Scientific Research and Review ISSN No.: 2279-543X ,Volume 07, Issue 03, March 2019
[4] Balch T, Dellaert F, Feldman A, Guillory A, Isbell C, Khan Z, Pratt S, Stein A, Wilde H “ multi-robot systems research will accelerate
[5] our understanding of social animal behaviour”, Proc IEEE 94:1445–1463

[6] Xiaoyu Zhang1 • Wei Huang2 • Xiao Lin2,3 • Linhua Jiang2 • Yan Wu4 • Chunxue Wu2,‘Complex image recognition algorithm based
[7] on immune random forest model”, Springer-Verlag GmbH Germany, part of Springer Nature 2020Y.
[8] Shuqiang Jiang, Senior Member, IEEE, Sisi Liang, Chengpeng Chen, Yaohui Zhu, Xiangyang Li“Class Agnostic Image Common
[9] Object Detection ”, Int. J. Comput. Vis., vol. 80, no. 3, pp. 300–316, 2008. [6]. S. Gould, J. Rodgers, D. Cohen, G. Elidan, and D.
[10] Koller,““Multi-class segmentation with relative location prior”, Int. J. Comput. Vis., vol. 80, no. 3, pp. 300–316, 2008.
[11] Wang, X., Shrivastava, A., & Gupta, A. (2017). A-fast-rcnn: Hard positive generation via adversary for object detection. In Proceedings of the IEEE conference on computer vision and pattern recognition (pp. 2606-2615).
[12] Chaudhuri, T. (2013). From policing to'social fencing': shifting moral economies of biodiversity conservation in a South Indian Tiger Reserve. Journal of Political Ecology, 20(1), 376-394..
[13] Ibraheam, M., Li, K. F., Gebali, F., & Sielecki, L. E. (2021). A performance comparison and enhancement of animal species detection in images with various R-CNN models. AI, 2(4), 552-577.
[14] Saxena, A., Gupta, D. K., & Singh, S. (2021). An animal detection and collision avoidance system using deep learning. In Advances in Communication and Computational Technology (pp. 1069-1084). Springer, Singapore.
[15] Peng, J., Wang, D., Liao, X., Shao, Q., Sun, Z., Yue, H., & Ye, H. (2020). Wild animal survey using UAS imagery and deep learning: modified Faster R-CNN for kiang detection in Tibetan Plateau. ISPRS Journal of Photogrammetry and Remote Sensing, 169, 364-376.
[16] Sheu, B. H., Yang, T. C., Yang, T. M., Huang, C. I., & Chen, W. P. (2020). Real-time alarm, dynamic GPS tracking, and monitoring system for man overboard. Sens. Mater, 32, 197-221.
[17] Bilodariya, B., Ramchandani, P., & Vala, D. L. (2017). Solar Based Electronic Fences with Wireless Informant. Kalpa Publications in Engineering, 1, 26-31.

