

A Real Time Human Monitoring And Animals Detection In Deep Forest

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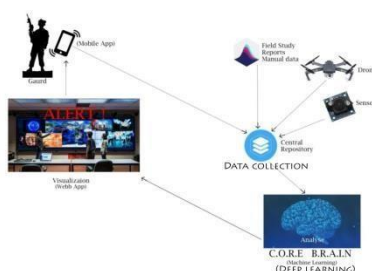
Abstract : We provided an affordable, scalable and state of the art end-to-end solution for tackling poaching and tracking animals/humans in protected areas. The whole idea comprises of three parts: 1. Android 2. Web 3. Intelligence (Deep Learning)

As you go through. Image Processing part of Deep Learning in this repository, more information on finding the shortest path is being thrown light on. The whole Idea is large and involves many parts, including HARDWARE set-ups such as - Raspberry Pi, Camera configuration etc to meet the ends of the solution in a real life scenario. The strategy to install them, connect them with sensors, monitoring station and the forest officers is unique to us.

Keywords: Forest Monitoring, Security, Detection, Objects.

1 Introduction

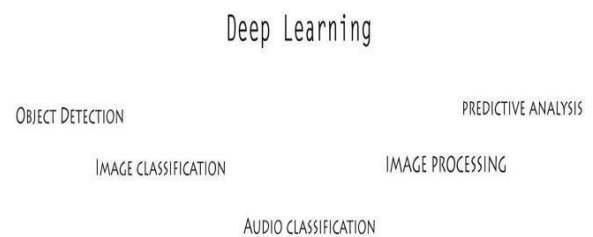
The idea of the solution is that, the forest officers will have a light weight android app with them (in a low cost handheld device) and they will be able to monitor/report activities in the wildlife. The android app user Interface has a map, showing real time location of all the forest officers in black and displays some other features like temperature, humidity etc. The UI also has a red button, so that the forest officers can press at any time in case they detect/suspect any poaching activity. As soon as they press the red button, the longitude and latitude of the ranger pressing the button will be sent to the web server and the server will update each and every forest officers app, showing shortest path from each and every ranger's



location to the location in DANGER.

2 Experimental

2.1 Deep Learning:



The Deep Learning section comprises of Object Detection, Image Classification, Audio Classification, Image Processing and Predictive Analysis. Each of the sections are written down with detailed description.

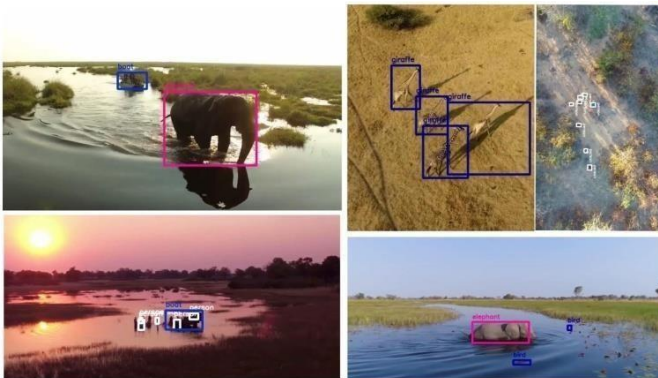
2.2 Object Detection

1. Real Time
2. Video Feed

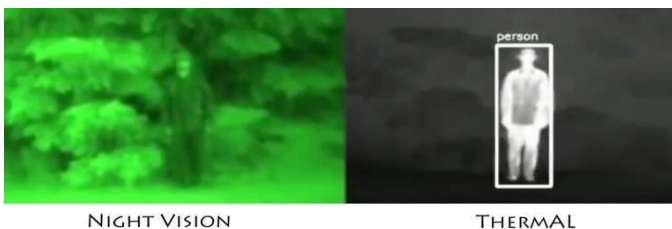


YOLOv2 trained on COCO Model was used for Object detection. Darkflow which is a Tensorflow variant of Darknet was used to process the frames. Darknet is an open source neural network framework written in 'C' Language and CUDA.

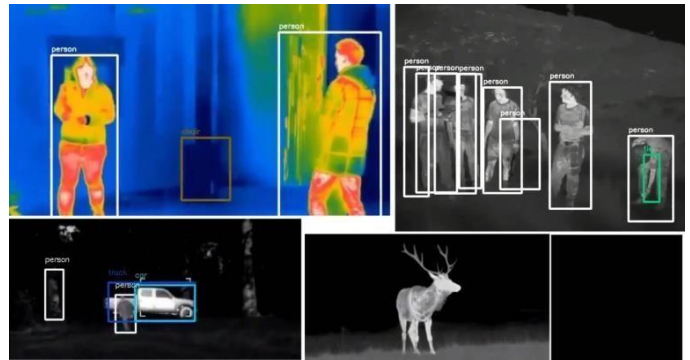
The output video in the Hackathon are: Webcam , Mobile Camera Several images of Guns, Poachers, forest officers were scraped from the internet and YOLOv2 was trained from scratch to detect the following object classes in the frames. Due to lack of data and time in the hackathon, high accuracy and confidence was not achieved. Wildlife Video Feed was fed to the layers of YOLO and animals / humans were tracked with high confidence in the wildlife. Some of the frames are :



Also, We know that deep learning is mainly dependent on Data. Due to lack of Animal categories in COCO Model , very strong detection was not achieved. Imagenet has Animal categories and we differentiate it with COCO Model, in the Image Classification section. The best strategy would be to form a huge dataset of animals only, this will help us classify the breeds and types as well. We also tried YOLO on Thermal, Night Vision, IR and Normal Video Feeds and the differences were astonishing. Please check 1:00 of this video to get a gist.



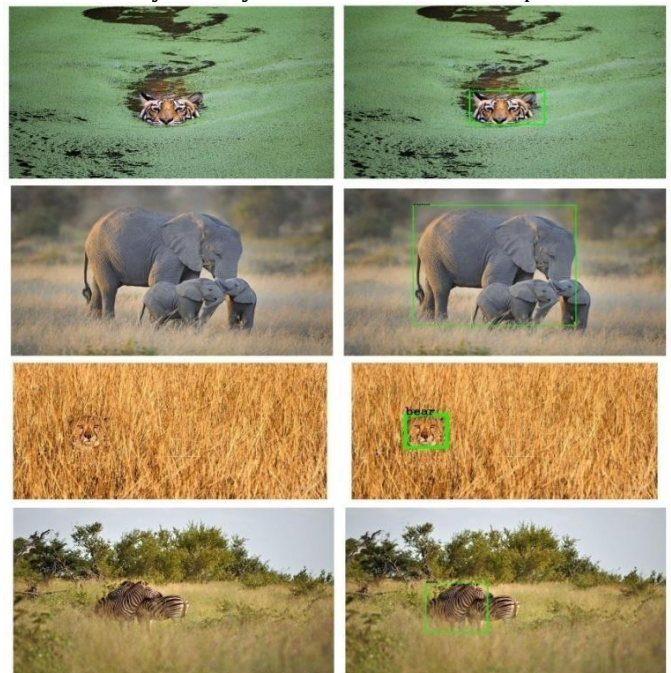
Several frames of object localization and classification are being portrayed in the following frames.



3 Classifications

3.1 Image Classification

Classifying the images of wildlife animals and having a bounding box is essential for detection. Used both ResNet50 and VGG16, trained on ImageNet and COCO Model datasets. Since COCO Model is a dataset based on real life objects, animal classification is a bit hard and inaccurate. It is able to detect and bound the animal, but not accurately classify it. The COCO Model outputs are:



As we can see:

- 1> Correct Bounding Box, Incorrect Classification
- 2> Correct Bounding Box, Correct Classification
- 3> Correct Bounding Box, Incorrect Classification though image has camouflage
- 4> Correct Bounding Box, Correct Classification

6 Conclusions

Thus we provided a low cost, state of the art solution, which can be implemented in the existing infrastructure of the wildlife sanctuaries / national parks. Thus integrating the hardware and software stacks we get a complete solution. Such that forest will be safe guard and terrorist and resource thief 's.100% safe of the forest will be maintained hence the fund allocated for forest maintenance guard will be reduced.Forest life will be safeguarded.

REFERENCES

- M. Armbrust, A. Fox, R. Griffith, A.D. Joseph, R. Katz, A. [26] "TechCrunch," Online Backup Company Carbonite Loses Custom Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica, and M. Zaharia, "A View of Cloud Computing," *Comm. ACM*, vol. 53, no. 4, pp 50-58, 2010.
- Preethi, B.C. and Vijayakumar, M. " A novel Cloud Integration Algorithm(CIA) for Energy Efficient High Performance Computing Applications in Big Data Multimedia Applications", *Romanian Journal of Information Science and Technology*, vol. 2, no.1, pp. 1-11, March 2018
- Prakash, S. and Vijayakumar, M., "An effective network traffic data control using improved Apriori rule mining," *Circuits and Systems*, Issue 10, Vol. 07, pp. 3162-3173, June 2016.
- V.S. Sureshkumar "Privacy preservation for cloud Data using Triones in Multi cloud", *International journal of innovative Research in Engineering Science and Technology* pp:1-7, Issue Special issue, volume3,2016
- K. Bowers, A. Juels, and A. Oprea, "Proofs of Retrieval: Theory and Implementation," *Proc. ACM Workshop Cloud Computing Security (CCSW '09)*, 2009.
- V.S. Sureshkumar, A.Chandrasekar, "Fuzzy-GA Optimized Multi-Cloud Multi-Task Scheduler For Cloud Storage And Service Applications", *International Journal of Scientific & Engineering Research* , Volume 4, Issue3, March-2013
- Prakash, S. and Vijayakumar, M., "Risk Assessment in Cancer Treatment using Association Rule Mining Techniques," *Asian Journal of Research in Social Sciences and Humanities*, Issue 10, Vol. 06, pp. 1031-1037, June 2016.
- Vijayakumar, M. and Prakash, S., "An Improved Sensitive Association Rule Mining using Fuzzy Partition Algorithm," *Asian Journal of Research in Social Sciences and Humanities*, Issue 06, Vol. 06, pp. 969-981, June 2016.
- Saveetha P and Arumugam S, "Study on Improvement in RSA Algorithm and its Implementation", *International Journal of Computer & Communication Technology*, Vol.3 No.6,PP.78, 2012.
- Saranya M and Nithya K, "Campus Navigation and Identifying Current Location through Android Device to Guide Blind People", *International Research Journal of Engineering and Technology (IRJET)*, Vol.02,Issue : 08,Nov 2015.
- B. Chen, R. Curtmola, G. Ateniese, and R. Burns, "Remote Data Checking for Network Coding-Based Distributed Storage Sys-tems," *Proc. ACM Workshop Cloud Computing Security (CCSW '10)*,2010.
- Gokulraj P and Kiruthikadevi K, "Revocation and security based ownership deduplication of convergent key creating in cloud", *International Journal of Innovative Research in Science, Engineering and technology*. Vol. 3, Issue 10, ISSN: 2319-8753, October 2014.
- Saveetha P, Arumugam S and Kiruthikadevi K, "Cryptography and the Optimization Heuristics Techniques", *Int. Journal of Advanced Research in Computer Science and Software Engg* , volume. 4, Issue.10, ISSN: 2277 128X, October 2014.
- Nithya K, Kalaivaani P C D and ThangarajanR, "An enhanced data mining model for text classification", *International Conference on Computing, Communication and Applications*,PP.1-4,2012.
- H.C.H. Chen and P.P.C. Lee, "Enabling Data Integrity Protection in Regenerating-Coding-Based Cloud Storage," *Proc. IEEE 31st Symp. Reliable Distributed Systems (SRDS '12)*, 2012.
- V.S. Sureshkumar, Dr.M. Vijayakumar, "DDoS Attack Detection By using Traffic Flow Analysis for Streaming Data ", *International Journal on Engineering technology and Science* pp:2-7, Issue 8, volume 2,2015
- Dhivyaa C R, Nithya K and Saranya M, "Automatic detection of diabetic retinopathy from color fundus retinal images", *International Journal on Recent and Innovation Trends in Computing and communication*,Vol.2 ,Issue 3, ISSN:2321-8169, 2012.
- L. Chen, "NIST Special Publication 800-108," *Recommendation for Key Derivation Using Pseudorandom Functions (Revised)*, <http://csrc.nist.gov/publications/nistpubs/800-108/sp800-108.pdf>, Oct. 2009.
- R. Curtmola, O. Khan, and R. Burns, "Robust Remote Data

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Checking,” Proc. ACM Fourth Int’l Workshop Storage Security and Survivability (StorageSS ’08), 2008.

Kamesh V, Karthick M, Kavin K, Velusamy M and Vidhya R, “Real-Time Fraud Anomaly Detection in E-banking Using Data Mining Algorithm”, South Asian Journal of Engineering and Technology, Vol.8, supplementary issue.1, PP.144-148, April 6, 2019.

R. Curtmola, O. Khan, R. Burns, and G. Ateniese, “MR-PDP: Multiple-Replica Provable Data Possession,” Proc. IEEE 28th Int’l Conf. Distributed Computing Systems (ICDCS ’08), 2008.

Dimakis, P. Godfrey, Y. Wu, M. Wainwright, and K. Ramchandran, “Network Coding for Distributed Storage Systems,” IEEE Trans. Information Theory, vol. 56, no. 9, 4539-4551, Sept. 2010.

Vijayakumar M and Prabhakar E, “A Hybrid Combined Under-Over Sampling Method for Class Imbalanced Datasets”, International Journal of Research and Advanced Development (IJRAD), Volume 02, Issue 05, pp. 27-33, December 2018.

D. Ford, F. Labelle, F.I. Popovici, M. Stokel, V.-A. Truong, L. Barroso, C. Grimes, and S. Quinlan, “Availability in Globally Distributed Storage Systems,” Proc. Ninth USENIX Symp. Operating Systems Design and Implementation (OSDI ’10), Oct. 2010.

V.S. Sureshkumar “Optimized Multicloud Multitask Scheduler for Cloud Storage and Service by Genetic Algorithm and Rank Selection Method” ,International Journal of Advanced Science Engineering and Technology , pp:2-7, Issue 4, volume 3,2014