

A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

NIGHT TIME OBJECT IDENTIFICATION



Introduction

- From security reasons to self driving cars, Object detection has become an integral part of our life.
- But very limited work was done in this field so far.
- So, for our research, we decided to explore this area and propose a night patrolling system using object detection mechanism.



Problem Statement

Object detection is **the problem of finding and classifying a variable number of objects on an image**. The important difference is the “variable” part. In contrast with problems like classification, the output of object detection is variable in length, since the number of objects detected may change from image to image. The purpose of this project is to identify the objects in low light.



PROPOSED MODEL

- SSD is a deep learning algorithm used for object detection. SSD initially performs tasks like object localization and classification in a single forward pass of the network.
- SSD is an Object detection model where different objects are identified in the image with the help of bounding boxes. Bounding box is a rectangular box, used to locate the target location by creating a collision box for that object.
- The input image is separated into grids of different sizes, and detection is conducted for distinct classes at each grid. Each one of these grids is given a score that indicates how good an object in the image fits within that grid.



Working and Analysis

In this project we used SSD, MobileNet V2 which works as a feature extractor from the images.

Step 1: Importing image

Step 2: Displaying the image to know what kind of image we are going to identify the objects.

Step 3: Resize the image to our convenience.

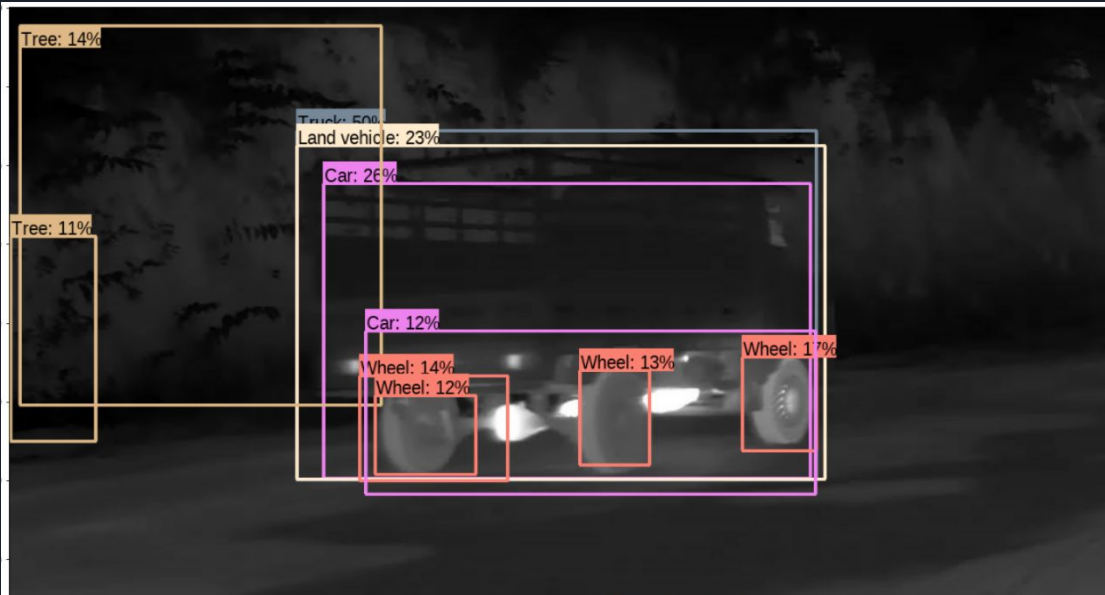
Step 4: Converting the resized image to a JPEG format to make future analysis easy.

Step 5: Decoding the image into vectors.

Step 6: Creating border margins to the identified objects in the resized image.

RESULT

After testing the model with the Night time thermal images, we achieved a reasonable accuracy to detect the objects in the image



Dust_motioncamera

Fig1



DUST_Flat_clutteresBackground

Fig 2

- Above presented results are images considered at DUST conditions.



Fog
Fig 4



DUST_visual_thermal
Fig3

- Above presented results are images considered at DUST and FOG conditions.

- Accuracy rate at day light condition





CONCLUSION

Night patrolling has always been a daunting field to dig into given the lack of reliable data and advanced algorithms. But this is a field with a lot of promise and is also a necessity given the times we live in. We received a lower accuracy score from our project work analysis. A lot more research has to be done to get a better accuracy score which will have multiple uses in the near future.



THANK YOU

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