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DEFENCE INTELLIGENCE USING REMOTE SENSING

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ABSTRACT

The research deals with detection of weapons using Artificial Intelligence & Machine Learning. Nuclear weapons are dangerous and life loss is more so the primary target is to detect the Aircrafts, Ships & Missiles which are nuclear powered. So The detection can be done by using the Remote sensing and ML Prediction. Training of the model can be done for prediction by using data. The image source is taking as input for detection.

EXECUTIVE SUMMARY

1.1Introduction: The model that developed is used in the Defence Intelligence. It is used to detect the aircraft, navy ships, Nuclear Powered Missiles. The detection can be done by our model using Images of Satellite. It will provide the Shield for our fighter jets & Ships by detecting & Giving the details before it reach to the border. It also detects the speed & Properties like length & breadth of vehicle that coming to attach which provides the Selection of Accurate requirement for Defence & offense

1.2 Working Procedure: The model that takes the vedio source or image source from the Satellite. And predect the objects. The trained model will increases it's Accuracy by continuous detection. The object are Aircrafts, Ships, Missiles etc.
Step 1: Training Model with available datasets
Step 2: Adding image source for detection.
Step 3: Prediction with accuracy
Step 4: Properties and speed discrimination.

1.3 Usability: It not only useful for the detection of Aircraft's, ships & missiles. But it also useful for rescue the people in Natural disasters like floods. It will be usable for different applications other than Diffense Intelligence operations like women safety, Animal Conservation by detecting endangered species easily, Used for navy, rescue the fisherman when they are in problem.

2. BACKGROUND

2.1 Details of platform : The language that used in the project is python & Editor is Jupiter Notebook. For making Classifier Cascade trainer GUI (version 3.3.1) is used. Dataset images are extracted from Google Earth.

2.1 Source of Input : It will take the satellite images for detection. We can also use this model with Unmanned Aerial vehicle having Webcam and other vedio or image sources for detection.

2.3 Brief note on the Technology : The technology that used for source is Remote sensing and for model making is Deep Learning with convolutional Neural network.
In the model default webcam is used.

2.4 Model Architecture :
#1. The model reads the Datasets with required libraries than it Discriminates the label & features.
#2. Converting the BGR images to gray scale image. Also by reshaping it into 100/100. and storing the data in numpy array.
#3. Then divide the numpy array with 255.0 then we wil get 0 or one at that pixel. Then the training is more efficient.
#4 Convolutional Neural Network can be formed and the flattened dense layer is about 50 nuerons & end with 2 neurons. Maxpooling size of(3*3). Convolutional 2D layer is taken as input.
#5. Training the model by using crossentropy and rmsprop optimizer. And measuring the Accuracy.

Data Visualization :

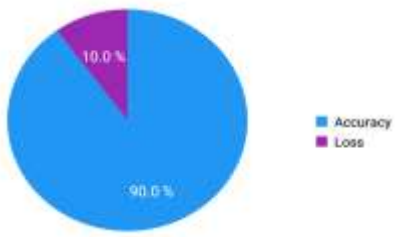

Figure Fig 2.4.1(a) accuracy & loss Visualization

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These are the Accuracy & Losses of the Two epoches as shown in fig 2.4.1(a)

#6. Reading the cassicde classifiers. Which is made with positive and negative Images. For detection of the objects.

#7. By taking the image source from the default camera. Then it will convert it into the gray scale image and also reshape it to 100/100 then make it into four dimensional array.

By adding the video or image source to the above model. Then it starts predicting as shown in fig 2.5.1(a).& fig 2.5.1(b)

2.5 Predicted Images :

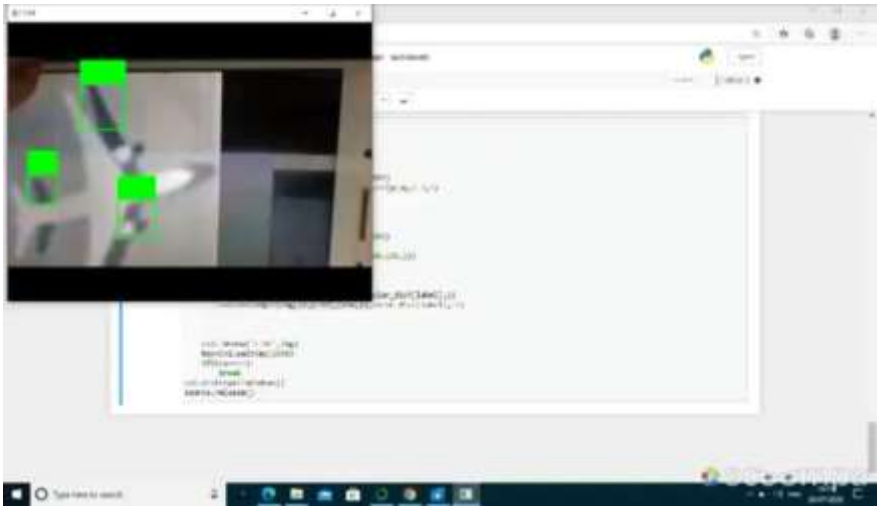

Fig 2.5.1(a) predicted image with 80% accuracy

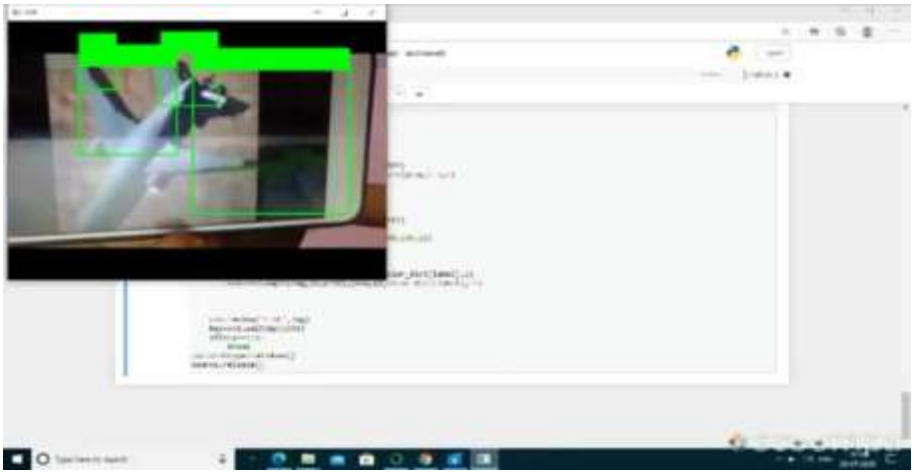

Fig 2.5.1(b) predicted image with 70% accuracy

1.4 CONCLUSION

It will be useful for different applications by changing the training datasets & Source of Input. The advantage of the model it not only predicts but also discriminates the properties. And improve it's accuracy by number of predictions.