Object Detection using YOLOv3 network

Implemented YOLO object detection algorithms with one class (i.e Building) on satellite images.

After preprocess image with Python Image Library that also include conversion of .tif format to .png, image will looks like as shown in Fig1.

Figure 1 Pre-processed image which is used as dataset to train and test the model

Tripoli_zipped\Tripoli_Map-Ready_Ortho_30cm\Tripoli_Map-Ready_Ortho_30cm\055675519050\055675519050_01_P001_PAN\16MAR08101213-P3DS-055675519050_01_P001

Data Creation:

100 images were obtained by random cropping of dimension 1000 x1000 px boxes from the entire images shown in Fig1.

Out of 100 obtained images, 95 images are used to train our model and 5 are used to test the performance of model.

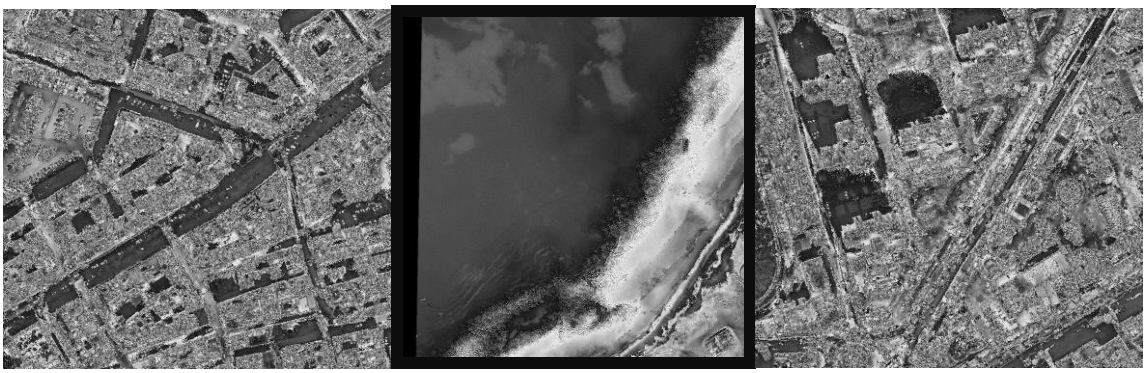


Figure 2 Cropped Images which are used to train and test the model

Labelling of Objects :

An open source graphical image annotation tool named **labelimg** is used to label object bounding boxes in images.

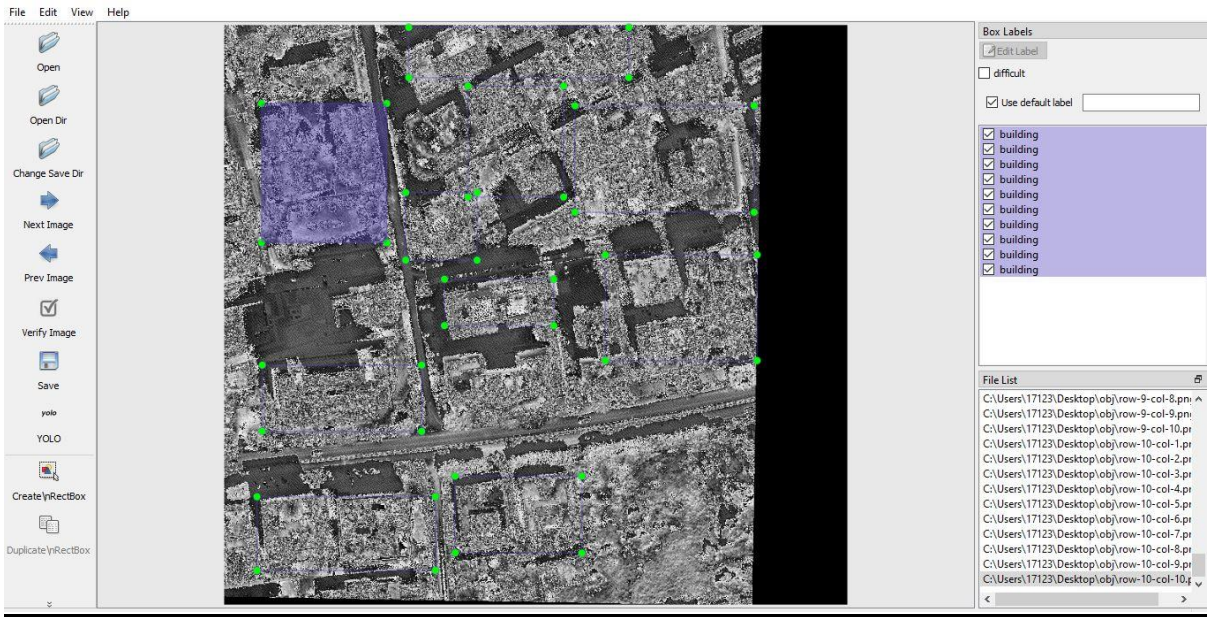


Figure 3 Illustration of labelimg tool

YOLO-v3 Object detection Model :

Yolo is implemented using darknet repo on google colab . whole folder that includes all codes and useful file can be access below link

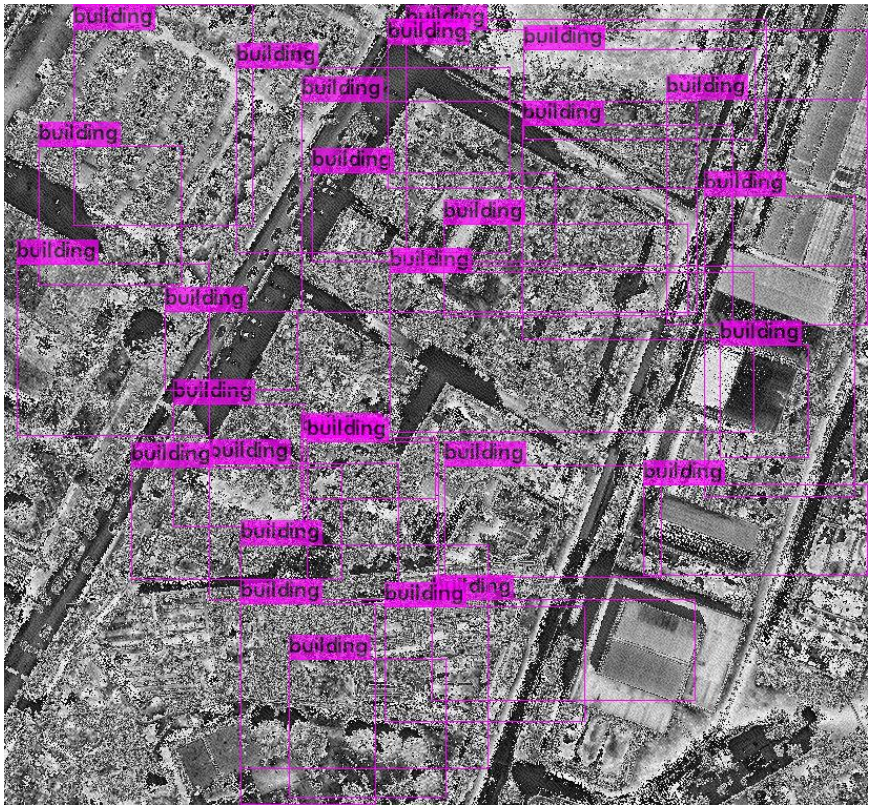
https://drive.google.com/drive/folders/1tm9IJnwgujeaD-iKiHz5qVg1uwoxVZpO?usp=sharing

and colab notebook can be access by

https://colab.research.google.com/drive/1-ME7yiJXDo3Krakp3Yh0-08gyY74SK0B?usp=sharing

Results :

Performance of our model on test data are as shown in below figure 4.



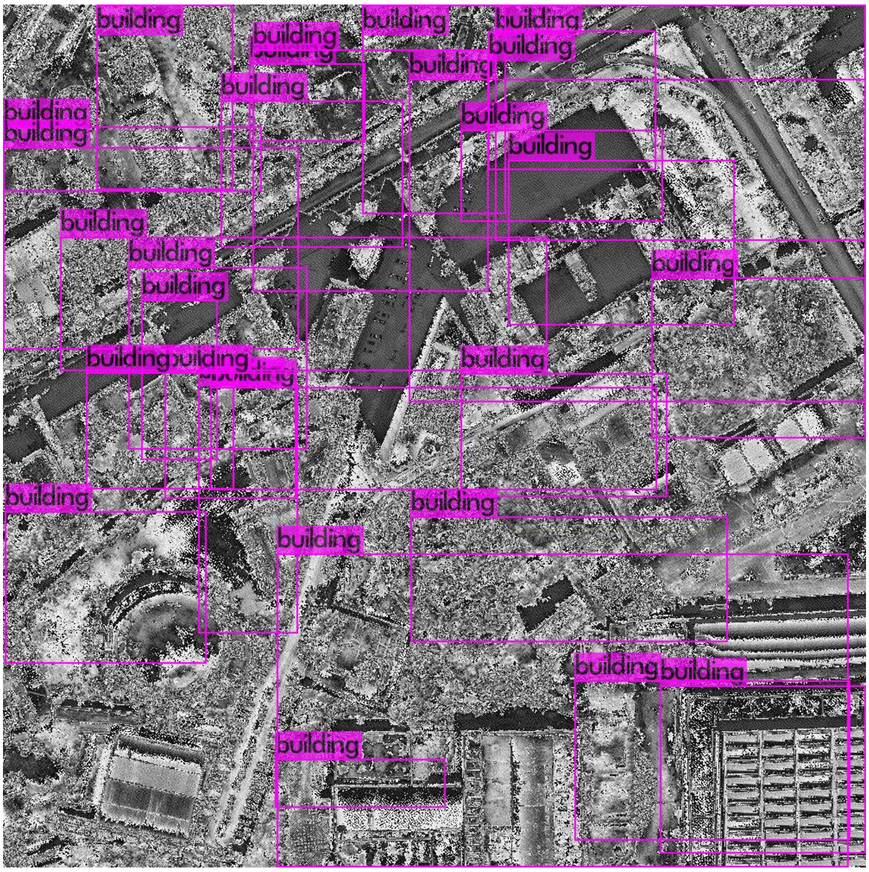


Figure 4 Performance of YOLO-v3

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