

Car Damage Mask RCNN

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Abstract: *The most challenging task is to detect the vehicle damage using a picture. In this proposed project vehicle damage detection using mask zonal convolutional neural network is to estimate of the damaged area of the car. Using higher technology like computer vision and machine learning the car damage detection with masking can be performed. Consider the situation of the accident place, the user can just send the photo of their damaged car and the company will upload the image to the computer, the computer will show the picture of damaged region with masking. Using higher mechanization like sighting system exp and machine learning will help to noticing the car damage detection with masking.*

Keywords: Detectron2, Mask RCNN, PyTorch, Machine Learning

I. INTRODUCTION

Due to huge population, driving a vehicle on a road and road traffic also increase rapidly. This will affect road traffic, congestion and also increase, the speeding accidents have become common on the road. Drinking and driving, drowsiness, irresponsible driving are major causes for road accidents. Due to these accidents the user claims the money for vehicle repair through vehicle insurance.

The conventional way of maintaining register a problem. If a person complaint has been registered in the company it will take many days or weeks to address the agent. After register a problem the agent will visit the accident location and look at the damaged vehicle conspicuously and makes note of the severity. The company starts declaring the process after visual inspection. The claim process will take more time or in the worst case it takes even years for claiming.

The conventional way takes more time, slower and requires a greater number of human resources. In advanced compound uses machine learning and multisampling technology to identify the car damage from the picture. The advanced solution is much faster than the conventional system. The easy way to detects the damage area in a minute compared to hours in the conventional system. T

he proposed solution eliminates the need for an agent for inspection, which saves time and money. One of advantages in this advanced system is the masking of the damaged area. In this proposed solution, it uses Mask RCNN which stands for mask regional convolutional neural network, which put on masking in damaged area. The masking helps in look over the damaged area much faster than just showing if the car is harm or not. Without masking it will be not easy to locate the damage area of car.

II. LITERATURE SURVEY

G Han J Su et al. In multi-convolution, accuracy will high, based on detection, but the mask occasion of segmentation cannot be completely correct, and some damaged area will not pinpoint correctly. The experiment take step by step process like firstly collect the picture of the damaged car for pre-processing and then use this as Labelme to make as dataset which will divide as train set and test set by using ResNet.

J. Sun et al. [1] The advanced designed based on the Residual network which uses less training data, provides higher accuracy. It performs the functionality faster than compared to other neural architecture.

Najmeddine Dhieb, et al. [3] The YOLO algorithm is faster compared to other type of object detection but it takes inference time is much lower compared to other algorithms but it mainly focuses on detecting and recognizing of the injured area using YOLO and also it recognize the area where damage will occur in different area by comparing tarin set and test set.

R. Girshick ,et al.[6]“Fast R-CNN,” The Network does not relatively focus on image in one go, even so it focal point on part of the image consecutively and also it will not point out correctly.

S. Bengio, et al. Unsupervised pre-training will give unknown data as well as labeled data, less accuracy of the result. In this model give evaluate in deep network is elaborated problem that is determined in great part by advanced training.
Y.-J. Cha, et al. [2] Proposed image processing technology to detect cracks in the building. In this system used CNN and inceptionV3 which involves and collect the images and it is a long process

III. PROPOSED METHODOLOGY

The steps are elaborated in the advanced systems are:

- Capture a damaged car as a input.
- Pre-processing phase
- Feature extraction by using CNN

4.1 Capture a Damaged Car as an Input.

In the below snapshot, it is clear from the captured image is injured area of the car is sort out and gather according to the demand, then data is noticeable by the annotation tool to make a dataset in the .json formate, it will used to identify the id and segmentation of the training set as well as test set.

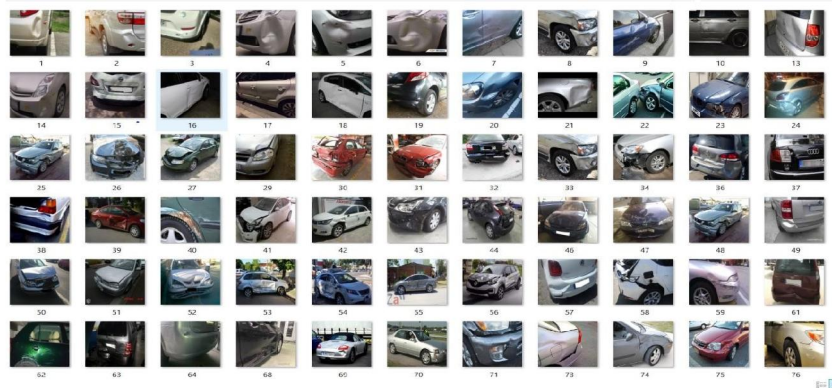
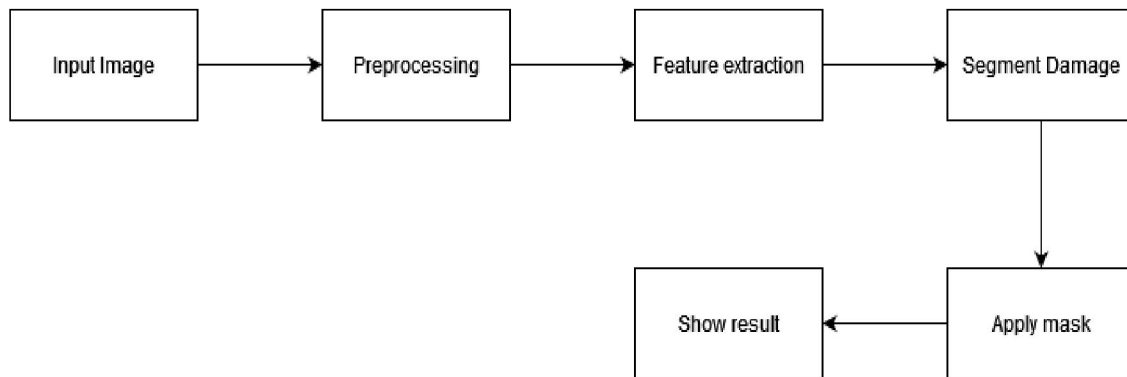


Figure. 1: Damaged car snapshot

4.2 Pre-processing Phase

In the next step the background unwanted images will remove and process the image then extract the feature like shape then annotation will done through co-ordinates by using intersection of union.



III. EXPERIMENTAL RESULT

Now a days deep learning play a major role and also it is the part of Machine learning and artificial intelligence here take a data set consist of damaged car it will train up by using adetectron2.

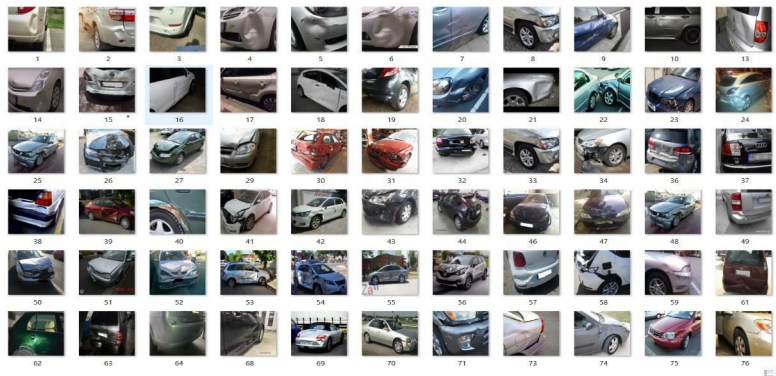


Figure 2: Capture Damaged Car

Through below graph tells that total loss is dropping down and accuracy is enlarging, this will done though detectron2 by using random method it will grouped up and redraft of detector that stated with masking by using CNN, that will gadget in PyTorch, it is use without restraint available for any uses as well as modify it and other developer can use it. After training done it will grouped and save in the coco_eval, it is large scale object detection it will help to detect the car.

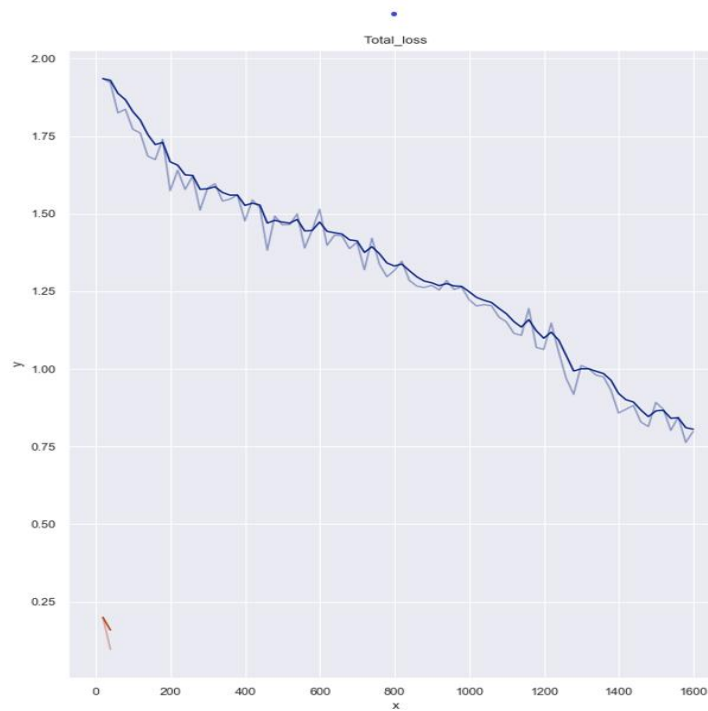


Figure 3: Total Loss

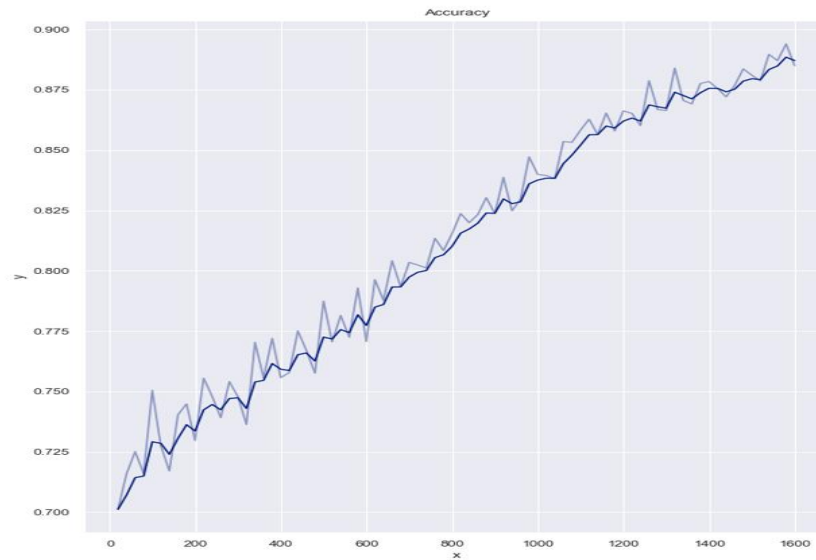


Figure 4: Accuracy

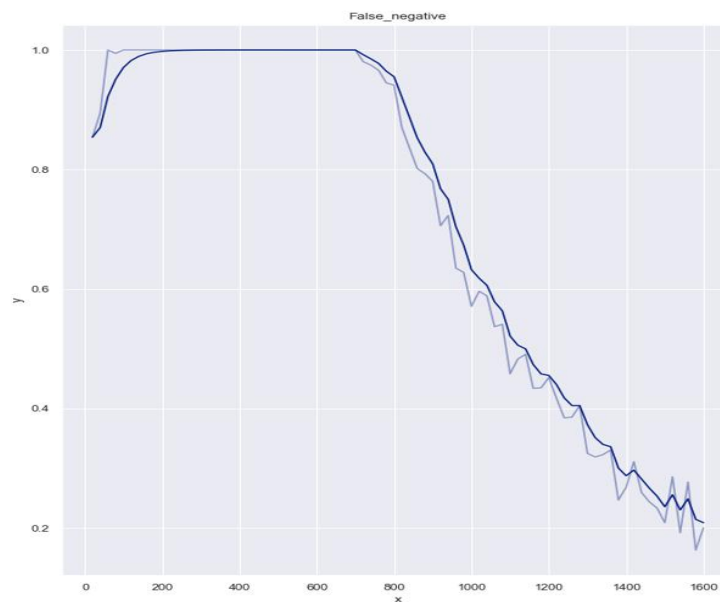


Figure 5: False Negative

After training done it will compare the train set and test set then recognize the damaged part then start doing masking by using CNN. Mask R CNN uses a totally attached network to anticipate the mask, this will take an role as input and output by representing $M \times M$ matrix.

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