**CASE STUDY**

**CAR PARTS DETECTION USING YOLOV3 MODEL**

**BUSINESS IMPACT**

Accuracy: >95%

Model File Size: 5MB

Reduced Manual effort

200+ car image data analyzed

**CUSTOMER KEY FACTS**

Industry: Automobile manufacturing and Vehicle Insurance

Location: India

**PROBLEM CONTEXT**

Car parts identification is a very important factor for any company to give the best quality automobile to the customer. Similarly, car parts that are damaged is also a big challenge to any insurance company to identify faults and come to a conclusion. During earlier times it was manual process wherein they were looking at the shape, size of part. Then the identification of the parts used to happen and manufacturing of it was done accordingly. So, it was a tedious task for the people working in automobile manufacturing industry.

Similar problems were faced by vehicle insurance companies to check manual which car part is being damaged and how much is the damage done to calculate the loss of car.

We wanted to vanish this manual activity and enhance the customers by providing them a one stop AI solution.

**CHALLENGES**

* Can only detect the car parts of a car which is bigger in size and close to the image
* Improve the training time of the object detection model
* Increasing unseen testing data to improve the accuracy of the object detection model
* Model overfitting to be considered
* Require large amount of RAM to store the data and run the model
* Works only in Google Colaboratory but not in other applications like PyCharm, Jupyter notebook, JupyterLab, Spyder etc.

**TECHNOLOGIES USED**

Python 3.8, Google Colaboratory, GitHub, VoTT (Visual Object Tagging Tool) for image annotation powered by Microsoft, Tensorflow 1.15.2, Keras 2.2.4, Tensorboard 1.15.0, Jupyter1.0, matplotlib 3.0.3, numpy 1.16.4, opencv-python 4.1.0, pandas, Pillow 6.6.6, scikit-learn, scipy 1.3,

**SOLUTION**

TPRI developed an AI model based on car parts detection to provide most accurate result of identifying and categorizing the part. This will definitely help the manufacturing unit to use model and verify the part based on shape, size. It will save the amount of work of man force. It will also increase the production of parts and its supply to the market in an effective manner. Similarly, this model can also work on the damaged car part where percentage of dent is being highlighted on the image and it become very easy for the insurance staff to calculate the total loss of the car faced by customer.

**RESULTS**

* Model identifying the car parts correctly and accuracy rate is more than 95%
* Easy to use solution
* Greater cost savings
* Producer and consumer friendly solution
* Can be considered as POC