

INTELLIGENT VEHICLE DAMAGE ASSESSMENT AND COST ESTIMATOR FOR INSURANCE COMPANIES

ABSTRACT

Claim leakage plays a very important role in the insurance sectors. Claim leakage can be defined as the actual insurance amount that was paid to the customers and the amount that should have been paid if all the market guidelines would have been followed. This reduction in the payment is termed as claim leakage. The same stands true for the vehicle insurance sectors as well.

The vehicle insurance amount can be estimated by uploading the image of the dent or impact. The development of this project would be done based on the VGG16 model designated to examine the area of damage and work based on the set of parameters that would work to give an estimated cost to be paid as insurance.

LITERATURE SURVEY

Recognition of Car Manufacturers using Faster R-CNN and Perspective Transformation - Israfil Ansari et. Al.

They proposed a method to detect car logos from CCTV footages. The approach involved performing perspective transformation on CCTV footages to get a clear view of the logos and then detecting and localizing the car logos through faster RCNN.

Automatic Car Damage Assessment through videos- Wei Zhang et. AI.

They proposed a method to detect and analyze car damage through user input videos. The approach involved 2 modules Damage recognition and localization and component recognition to segment the damage and components at pixel level to get accurate results. The model required high quality videos as input to generate accurate results.

Auto Insurance Claim Using CNN Model - Li Ying & Dorai Chita

A CNN based machine learning model was developed that provides Image recognition and Pattern recognition which was capable enough to predict the degree of damage to the vehicles. This would shorten the time of vehicle claim processing by improving the first notice of damage and bringing rapidity in investigation. A prototype was built that identifies the damaged areas based on the age.

This project had an accuracy of 85% - 90%. The drawback was, the image can only be processed if it had a white background.

Damage Analysis of AI based Machine Learning - Phyu Mar Kyu et. AI.

They presented that artificial intelligence can be used for damage analysis and detection. In order to prove this, they developed a CNN model, trained it using ImageNet dataset and fine tuning. Two different approaches are developed, VGG19 and VGG16.

The performance of these models is as follows:

Damage detection:	VGG19- 95% & VGG16- 94%
Damage localization:	VGG19- 76% & VGG16- 74%
Damage severity:	VGG19- 58% & VGG16- 54%

This shows that VGG19 performs better than VGG16. The only drawback of this model is that, since the vehicle damage is a very specific domain, no real dataset is available to be worked with.

Car Damage Assessment using CNN

The dataset used in training the model was obtained through web scraping. Developing and training a CNN model with 10 convolutional layers and 3 pooling layers with RELU. As the activation function at each layer and the final layer being a Fully Connected Layer. The model performed well on high quality images but gave inaccurate results on blurred images.

Image Based Vehicle insurance - U. Waqas et. Al.

They showed that the vehicle insurance processing and loan management has the scope to become fully automated. The classification of these images can be achieved by developing a deep learning based mobile net model. Based on these classifications the damage is classified as fully, partially or zero damage.

The problem of fake images, screenshots and the images from unsuitable angles can be countered by using a hybrid approach to provide authentic images. The image classification has 95% accuracy and the damage detection has a 99% accuracy.