Project id : PNT2022TMID38777

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Project Title : Intelligent Vehicle Damage Assessment and Cost Estimator for the Insurance Companies

LITERATURE SURVEY

Paper 1:

Title : Automatic Car Insurance Using Analysis Image.

Author : Aniket Gupta, Jitesh Chogale, Shashank Shrivastav, Prof. Rupali Nikhare.

Journal : International Research Journal of Engineering and Technology.

Year : April 2020.

Methodology : In this System, **CNN Model** is used to implement automatic car insurance using **image analysis** and provide an optimistic cost to the user. They used **Django framework** to design the user interface and integrate car damage prediction model to the system.

Scope : Initially the policyholder will have to register on the website, then fill in the required information of the customer and car and then upload the image. By using CNN model the cost will be predicted and it will be displayed on the screen.

Paper 2:

Title : Car Damage Assessment for Insurance Companies.

Author : Mandara G S and PrashantAnkalkoti.

Journal : International Journal of Advanced Research in Science, Communication and Technology (IJARSCT).

Year : June 2022

Methodology	:	In this model, they used **Convolution Neural Network model** and **VGG16** for detecting the car image and to analyses the damage of the car.
Scope	:	It first takes damaged car image as an input. Detection of the car is done perfectly then analyse the damage of the car by applying the neural network. In this system they carry out some functions including car detection, car damage analysis, predict the location of the damaged car like front, back, side and also car damaged severity like minor, moderate, severe.

Paper 3:

Title	:	Automatic Assessment of Damage and Repair Costs in Vehicles.
Author	:	Vikas Taliwal, Siddhartha Dalal, Kaigang Li, Gaurav harma.
Journal	:	United States Patent Application Publication.
Year	:	Oct 2017.
Methodology	:	In this System, they used **CNN** to detect the pose of the vehicle And damage analysis. Then execute a **Markov Random Field (MRF)** algorithm to internal parts of the vehicle from the damaged external vehicle parts.
Scope	:	Finally it estimate the repair cost based on the external and internal damaged parts.

Paper 4:

Title	:	Damage Assessment of a vehicle and Insurance Reclaim.
Author	:	Vaibhav Agarwal, Utsav Khandelwal, Shivam Kumar, Raja Kumar, Shilpa M.
Journal	:	International Journal of Creative Research Thoughts (IJCRT).
Year	:	April 2022.
Methodology	:	In this model they used **CNN** for the auto insurance claiming process then **image analysis and pattern recognition** technologies are used to detect the car damages.

Scope	:	In this system firstly, it takes an damaged car image as input then the image processing analyses the percentage of damage and divides it into two factors as repair and replace. Then at last it generates a detailed report on analysis of the automobile and use this to claim one's reimbursement with the insurance company.

Paper 5:

Title	:	Assessing Car Damage with Convolutional Neural Networks.
Author	:	Harit Bandi, Suyash Joshi, Siddhant Bhagat, Amol Deshpande.
Journal	:	Sardar Patel Institute of Technology.
Year	:	April 2020.
Methodology	:	In this System, they used **Convolutional Neural Networks (CNN)** for classification of problems and **RCNN** for detecting the car image and to analyses the damage of the car.
Scope	:	In this Model it takes damaged car image for (logistic or logic classification). Secondly, it extracts the features of car damages. Finally, image classification has been applied on the feature vectors to **determine the severity of the damage to the car.**

Paper 6:

Title	:	Car Damage Detection using Deep Learning.
Author	:	Dindayal Bhadrecha, Divyesh Tharakan, Chandrababu Godasu, Hrushikesh Jadhav.
Journal	:	International Research Journal of Engineering and Technology (IRJET).
Year	:	June 2022.
Methodology	:	In this paper, they created their own dataset and experimented with various algorithms such as **Yolo v5** and Faster **CNN**. They observed that the transfer learning combined with Mask **RCNN** performed the best. They are also note that only car specific features may not be effective for damage classification.

Scope	:	It collects damaged car image using VGG annotator and Saved as JSON file. Then applying mask RCNN and train model. The neural network is used for extracting features and transfer learning applied to improve the performance. Finally it predicts damaged car status.

Paper 7:

Title	:	Front-View Vehicle Damage Detection using Roadway Surveillance Camera Images.
Author	:	Burak Balci, Yusuf Artan, Bensu Alkan and Alperen Elihos.
Journal	:	VEHITS 2019 -International Conference on Vehicle Technology and Intelligent Transport Systems.
Year	:	2019.
Methodology	:	First, they detect the vehicle within the raw image using a novel **SSD model**. Second, using the cropped image to generate deep feature representations of vehicle. Finally, by using **image classification for** applying a classification operation on the feature vectors, they have determine the damage status of the vehicle.
Scope	:	This method indicates that the ensemble model that combines the symmetrical analysis feature representation and transfer learning feature representation yields the most accurate result with the accuracy rates

Paper 8:

Title	:	Automated Detection of Multi-class Vehicle Exterior Damages using Deep Learning.
Author	:	Maleika Heenaye - Mamode Khan, Mohammad Zafir Hussein Sk Heerah, Zuhairah Basgeeth.
Journal	:	IEEE.
Year	:	October 2021.

Methodology	:	In this paper, they have adapted the pre-trained **CNN** models namely the MobileNet and VGG19 and applied a transfer learning on large constructed dataset for Vehicle damage analysis application.
Scope	:	They have used Adam optimisation to enhance the model. MobileNet has achieved an overall performance of 70% whereas VGG19 has achieved 50% and it provides promising results for vehicle damage.