INTELLIGENT VEHICLE DAMAGE ASSESSMENT AND COST ESTIMATOR FOR INSURANCE COMPANIES

Literature Survey:

1. Damage Assessment of a vehicle and Insurance Reclaim:

This paper presents a system using CNN and image classification to assess the severity of damage to an automobile, which takes a user's input as an image to test the severity of the damage, which happens in two steps. The first step is image classification, where the user's input is used by the neural network to determine whether or not an automobile is damaged. the region and severity of the damage are determined in the second step using object detection on the flattened input that was received as the output in step one. The area may be the back, the front, or the side, and the severity may be classified as minor, moderate, or major. A report is filed and delivered to the user and the insurance company when the R-CNN network determines the extent of the damage. With little human contact, the user will be able to receive payment based on the results of the models.

2. Convolutional Neural Networks for vehicle damage detection:

In this paper, a model for detecting vehicle damage is created, and it is divided into twelve categories. A deep learning model that can accurately detect and classify vehicle damages is created and evaluated in a specially designed light street, indicating that strong reflections complicate the detection performance.

The proposed model outperforms other existing models in the classes Bend and Cover Damage. FSSD with Darknet-53 and YOLO v3 with Darknet-53 yield the best results. The drawback of the proposed approach is the robustness against different light conditions

3. Car Damage Assessment for Insurance Companies:

In this paper a neural network-based solution for car detection, managing the problem of car damage analysis, prediction of car damage location and severity of the damage is proposed. The proposed system is intended to help insurance companies to analyze car damage a lot more successfully and well organized, and it quickly performs car damage detection by sending the image containing a damaged car for visual inspection. This system utilizes a machine learning approach along with computer vision to decide the damage analysis, the location of the damage as well as the severity of the damage.

4. Assessing Car Damage with Convolutional Neural Networks:

This study focuses on automotive damage estimation, with auto insurers as their main potential clients. Three different Transfer Learning techniques are employed to do this, each of which identifies the existence, location, and degree of damage. Convolutional Neural Networks, which are adapted to maximize accuracy, serve as the foundation for the algorithms used. Each approach is analyzed and varying degrees of accuracy were achieved across different models deployed ranging from 68% to 87%. In this work, accuracy as high as 87.9% was attained. This study improves a number of existing methods and creates opportunities for collaboration in image recognition, notably in the field of auto insurance.

5. Vehicle Damage Classification and Fraudulent Image Detection Including Moiré Effect Using Deep Learning:

This paper proposes deep learning-based methods for the classification of car damage types - MobileNet to classify vehicle damage into three groups: medium damage, enormous damage, and no damage. The extent of the damage to the vehicle determines its severity, ranging from medium to huge. The damage categories are based on typical damage kinds including shattered glass, dents on the front or back, damaged lamps or bumpers, etc. Automation in real-time applications, however, faces several challenges. Instead of capturing a picture of a car in real time, users can upload fake pictures. Making fake photos can involve using image-editing software to cover up flaws, getting images from the internet, or even taking screenshots of other devices' screens. To deal with these kinds of fake photographs, a hybrid strategy is also suggested in this research. To determine whether an image has been altered or is a screenshot, metadata analysis, and image editing software signature detection are used. It is suggested that moiré effect detection be used to determine whether an image was captured from the screen of another device, such as a computer screen when a mobile phone was used to snap a photo of an automobile.

6. Deep Learning Based Car Damage Classification and Detection:

In this paper, they address the problem of vehicle damage classification/detection, which can be used by insurance companies to automate the process of vehicle insurance claims. With the adoption of fast, scalable, and end-to-end trainable convolutional neural networks, it is now technically feasible to recognize vehicle damages using deep convolutional networks. Various online sources containing different types of vehicle damage were manually collected and annotated. Using CNN models pre-trained on the ImageNet dataset and other techniques to improve the performance of the system, we achieved top accuracy of 96.39%, significantly better than the

current results. In addition, they used a state-of-the-art YOLO object detector to detect the damaged region, achieving a maximum map score of 77.78% on the held-out test set, demonstrating the model's ability to recognize different vehicle damages. Furthermore, the paper proposes a pipeline for more robustly identifying vehicle damage by combining classification and detection tasks.

7. Car damage detection and classification:

In this paper, a CNN model is developed and trained on the ImageNet dataset. After fine-tuning the dataset, transfer learning with L2 regularization is applied. In the proposed system, a Pre-trained VGG model not only detects the damaged part of a car but also assesses its location and severity. With the use of transfer learning and L2 regularisation, the proposed system achieves an accuracy of 95.22% of VGG19 and 94.56% of VGG16 in damaged detection, 76.48% of VGG19 and 74.39% of VGG16 in damage localization, and 58.48% of VGG19 and 54.8% of VGG16 in damage severity.

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