



**INFORMATICS
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INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

Smart Claim AI

**AUTOMATION SYSTEM FOR VEHICLE DAMAGE DETECTION
AND COST ESTIMATE BY USING COMPUTER VISION.**

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Submitted in partial fulfilment of the requirements for the BEng (Hons) in Software Engineering degree at the University of Westminster.

May 2nd, 2023

ABSTRACT

The vehicle collision industry faces challenges such as rising costs and increasing complexity of repairs. Insurance companies manage the claims process, which is time-consuming and prone to errors, leading to increased costs and delays. To address this, insurance companies have started using advanced technologies like artificial intelligence and machine learning. This study proposes an automated system that utilizes computer vision and deep learning algorithms to detect and classify vehicle damage accurately and efficiently. By automating the damage estimation process, the proposed system aims to reduce the time and energy required from both the customer and the insurance company, ultimately improving the customer experience.

The proposed system utilizes a Detectron2 model trained on a large dataset to enhance the accuracy and efficiency of vehicle collision damage detection and cost estimation. The system will be accessible via a web application, enabling drivers to send photographs of the damaged vehicle for automatic assessment. This approach not only reduces the time taken for assessment but also ensures greater accuracy, reducing the possibility of disputes and dissatisfaction among customers. Through various requirements elicitation methodologies, the research provides essential information and requirements for the proposed system, ultimately offering a practical and streamlined solution for clients to submit photos and receive results, reducing the time and resources required for the insurance claims process.

The proposed system's performance was evaluated using segmentation techniques, and the confidence (accuracy) was 75%. The results demonstrate that the proposed system offers a novel approach to the problem of vehicle damage detection, providing a more accurate and efficient solution that eliminates the possibility of human error and improves the customer experience. By utilizing computer vision and deep learning algorithms, the proposed system offers a consistent and reliable solution for damage detection, reducing the possibility of disputes and ensuring the safety of passengers and other parties involved in future accidents.

Keywords: Vehicle collision, Damage detection, Computer vision, Deep learning.