**Abstract**

This study presents a thorough method for evaluating vehicles by incorporating orientation detection and damage identification Convolutional Neural Network (CNN) and Transfer Learning. The goal is to create a model that can classify vehicle orientations and identify damages from dents, scratches, and deformities simultaneously. The developed solution could be used to elevate the presentation of automotive products on sales websites, focusing on bolstering customer engagement and increasing revenue. By utilizing transfer learning methods, the model is adjusted on a dataset with various vehicle images. A multi-task learning approach is utilized to teach the model how to carry out both orientation classification and damage detection tasks at the same time. Assessing the performance of the trained model includes evaluating how well it works on validation datasets from various sources to ensure it is reliable and works well in different situations. Additionally, the model is to be put on the Streamlit cloud platform, making real-time vehicle assessment available through an easy-to-use interface. This study helps improve automated vehicle inspection systems that could be used in tasks like insurance assessments, vehicle maintenance, and accident analysis. The methods used, how the dataset was selected, training techniques, measures of evaluation, and deployment plan are all described to provide a better understanding of how the suggested vehicle assessment system was developed and can be used.

**Methods**

1. **Model Architecture Selection:** Utilizing Convolutional Neural Network (CNN) and Transfer Learning Models architecture for its proven performance in image classification tasks.
2. **Data Preprocessing:** Augmenting and preparing a labelled dataset comprising vehicle images with diverse orientations and damage types.
3. **Multi-Task Learning:** Implementing a multi-task learning approach to simultaneously train the model for orientation classification and damage detection.
4. **Evaluation:** Assessing the performance of the trained model through metrics such as accuracy, precision, recall, and F1 score on validation datasets.
5. **Deployment:** Deploying the trained model on Streamlit cloud for real-time vehicle assessment.

**Data**

1. **Dataset Collection:** Curating a dataset of vehicle images from various sources, including online repositories. we are planning to classify
2. **Data Augmentation:** Applying augmentation techniques such as rotation, scaling, and flipping to increase dataset diversity and model robustness.

**Goal**

1. **Comprehensive Assessment:** Develop a model capable of accurately detecting both vehicle orientation and damage types, facilitating a comprehensive assessment of vehicle condition.
2. **Generalization:** Ensure the trained model can generalize well to unseen data from diverse sources, including different vehicle makes, models, and environmental conditions.
3. **Performance Metrics:** Achieve high-performance metrics, including accuracy, precision, recall, and F1 score, to ensure reliable and trustworthy results.
4. **Application Versatility:** Enable the model to be applicable in various domains such as insurance assessment, vehicle maintenance, and accident analysis, addressing different stakeholders' needs.