

- Rutul Patel (IU2041220072)
- Nidhi Patel (IU2041220065)
- Unnati Rawat (IU2041220080)

Internal Guide:  
 Prof. Sejal Thakkar

## INTRODUCTION



- Advanced car price prediction model is designed to serve customers with an accurate and fair price estimation for their used car.
- Consumers can simply enter details like model, build type, mileage etc. and the system will input the features (car information) into our Machine Learning model and in seconds, they will receive fair market value for their cars.
- Additionally, we are offering a solution for car damage assessment with the ability to identify damages through images uploaded by customers.
- Our model is built on advanced deep learning techniques like CNNs and YOLOv4 using Keras backend support, which will analyse and classify a wide range of car damage, and localize it based on the area of damage detected.

## OBJECTIVES



- The main objective of the project on Advanced Car Price Prediction Model was to design and train a machine learning model that integrates car feature data with damage assessment from the image-based detection system, and thoroughly evaluate model performance using relevant metrics.
- Moreover, we have build an intuitive web interface that seamlessly guides users through the valuation process, from feature input to damage detection and final price estimation.
- This project aims to revolutionize the used car valuation process by addressing the challenges of uncertainty and potential bias. We developed, integrated, and rigorously evaluated cutting-edge technologies in machine learning and computer vision to achieve these goals. The project's objectives encompass the creation of accurate predictive models, the development of a user-centric interface, and the assessment of the system's broader impact on the used car market. Moreover, we have provided more of an interface than a website, implying that it can be integrated and deployed anywhere, as per the requirements.

## FUTURE ENHANCEMENTS



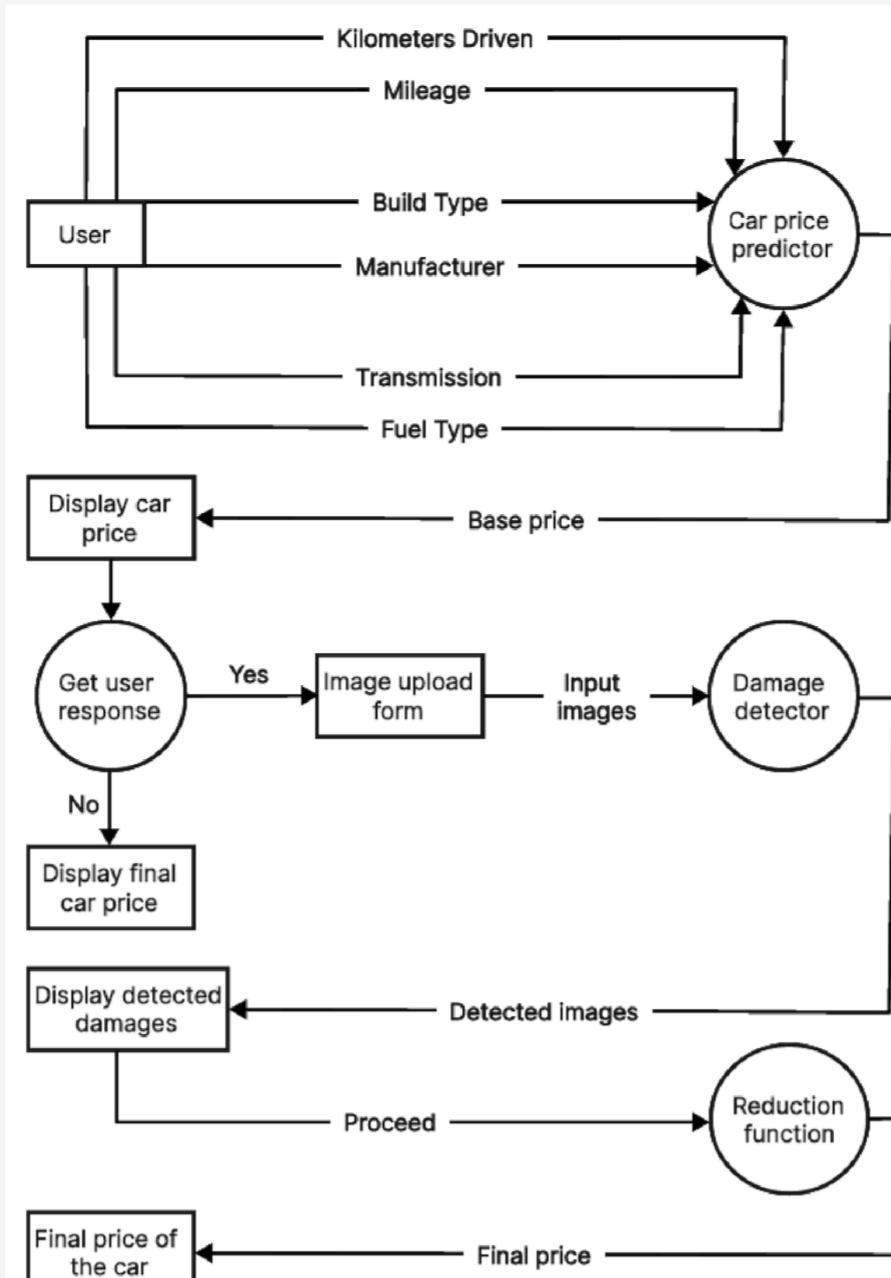
- This project lays a strong foundation for future advancements in used car valuation. It serves as a framework for developing more sophisticated analytics tools, like market trend analysis and valuation forecasting. Below are some ideas that can be incorporated along with the Advanced Car price prediction model:
- Enhanced Model Performance:** Upgrading the damage detection model to a more recent YOLO architecture (v7, v8) should be prioritized for improved accuracy and speed. This would significantly enhance the reliability of the system's valuations.
- Robust Datasets:** Sourcing larger and more diverse datasets for both car price prediction and damage detection. Incorporating a wider range of car conditions, image backgrounds, and valuation sources will increase the models' adaptability to real-world scenarios.
- User Account System:** Implementing registration and login features to allow users to save past valuations, track market trends over time, and enhance personalization.
- Data Analytics:** Adding a module to provide users with insights into market trends, price fluctuations based on damage severity, and potentially regional variations in car valuations.

## SOCIAL BENEFITS:



- Building Trust Through Transparency:** Transparency & Trust: Clearer picture of car condition and value for buyers and sellers. This empowers informed decisions, reduces overpaying, and fosters trust between parties.
- Fighting Fraud:** Damage detection integrates with insurance claims, allowing policyholders to verify claims and potentially reduce fraud, lowering costs for everyone.
- Consumer Empowerment:** Information empowers consumers to make informed decisions in the used car market, leading to a more efficient market overall.

## DATA FLOW DIAGRAM

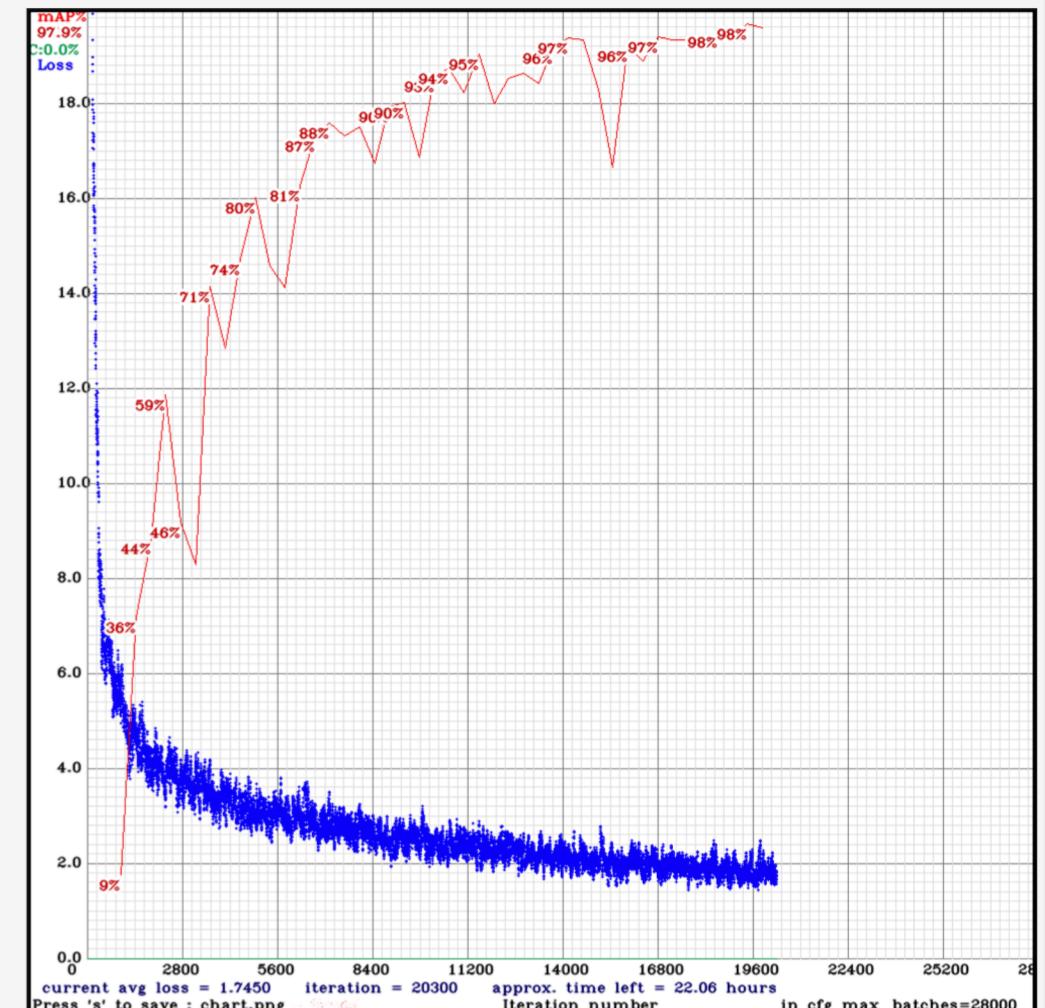


## TOOLS AND TECHNOLOGY

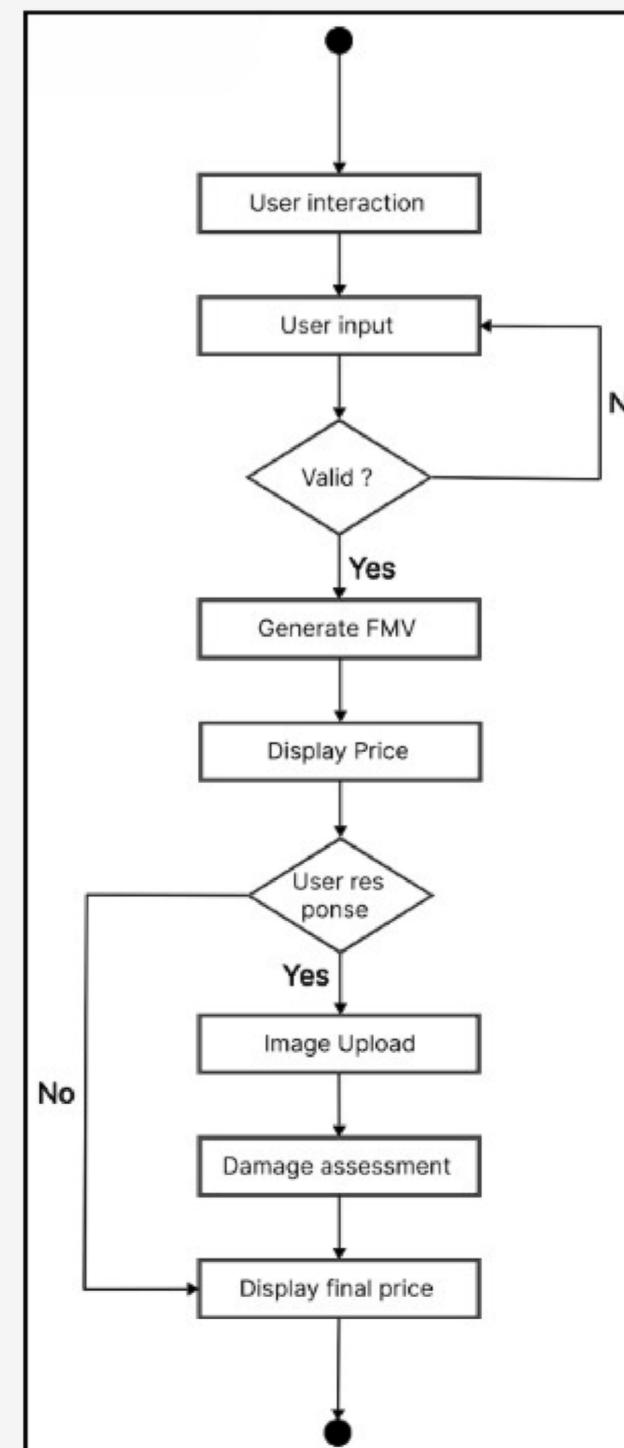


- Frontend : HTML, CSS, Javascript and Jinja.
- Backend : Python, Flask, OpenCV, Keras
- Frameworks: Darknet, Tensorflow

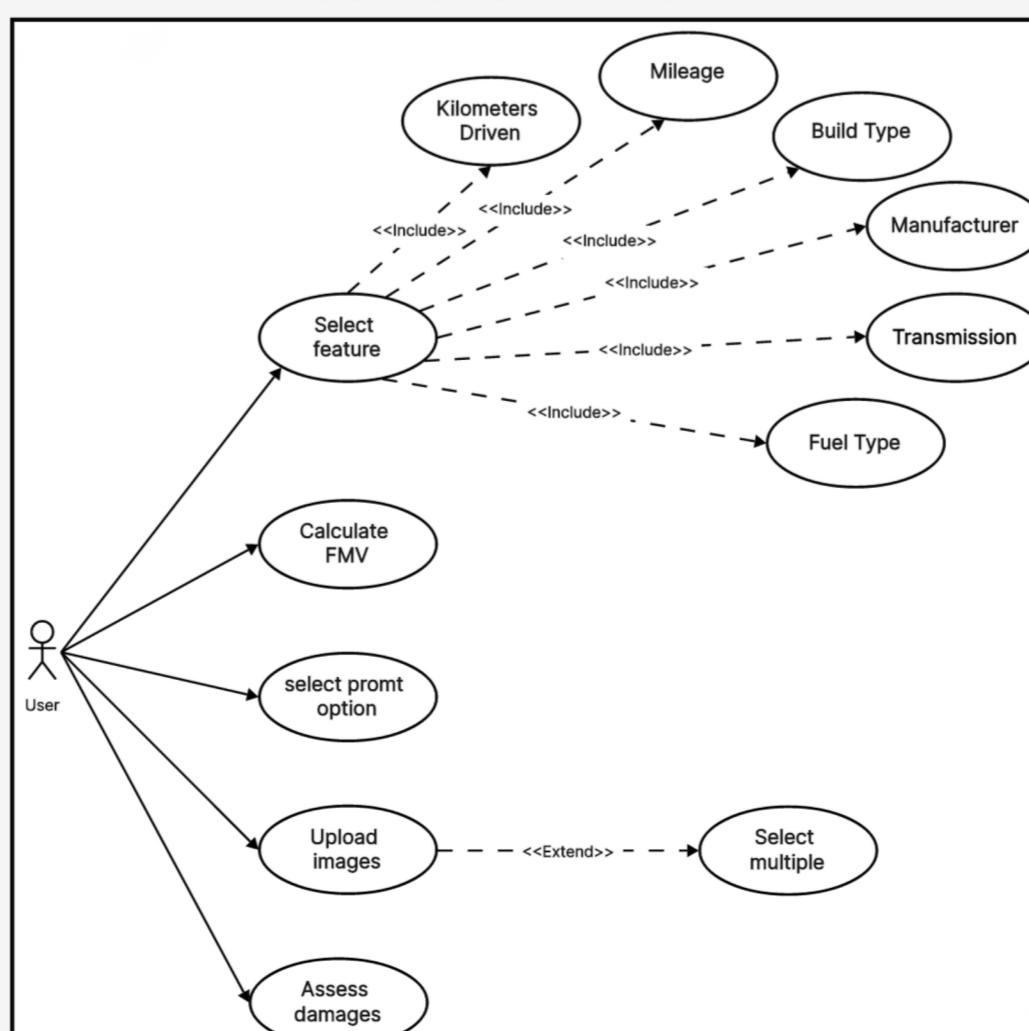
## MODEL TRAINING



## ACTIVITY DIAGRAM



## USE CASE DIAGRAM



## CONCLUSION



- This project successfully delivered a user-friendly system designed to empower both buyers and sellers in the used car market. Through careful planning and iterative development, we established a foundation for a comprehensive valuation tool. The system offers a user-friendly web interface that guides users through a step-by-step process.
- Users first enter details about their car to receive a base price estimate. They then upload pictures, and the system utilizes damage detection to adjust the valuation accordingly, providing a final adjusted price. The project prioritized user experience by designing an intuitive interface and following established software development practices with thorough testing to ensure system reliability and accuracy.
- The project originated from a clear understanding of market challenges faced by both used car buyers and sellers. We identified a need for objective valuation and transparent damage assessment. This system addresses these challenges by providing users with a data-driven approach to used car valuation, incorporating damage detection for a more accurate final price.

• Damage Detection model has returned the following result.

