

Project On

# Intelligent Vechile Damage Assessment & Cost Estimator for Insurance Companies

powered By IBM India

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Project ID: PNT2022TMIDO7174

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## **Abstract**

The project "Intelligent Vechile Damage Assessment and Cost Estimator for Insurance Companies" is a responsive web application powered by aritifical Intelligence and IBM Watson Cloud. Deep Learning model is trained with the various damaged car images in various views and the VGG16 from the TensorFlow library is used for the better Deep Learning model architecture. An attractive front end can be developed using HTML and CSS. The pages such as Index.html , login.html, logout.html, register.html and prediction.html are created and embedded with the IBM cloud databse using python framework called flask. The web application takes the image input and estimate the cost for the insurance companies based on the damages in the car.

**Keywords:** Deep Learning, Web Application, Cost Estimation

## **Introduction**

The project is based on the domain of Artificial Intelligence and powered by the IBM watson cloud. A responsive web application can be developed using the HTML and CSS which is connected to waston cloud. In the cloud, a database service by availing the service Instance of the IBM cloud and the database API key is collected and connected with the front-end using flash which is an python framework for designing the backend. Pages such as index.html, login.html, logout.html and prediction.html are used to interact with the web application. The user can register and the data of the user is saved in the databse of the IBM cloud, during the time of login, the login ID is compared with the ID in the databse and allow the user to the next page. The Deep Learning model is build using the VGG16 which is present in the keras library and the model is trained with the images of mulitple car with various level cum types of damages. The model is deployed in the back-end using the flask and the prediction.html page is setted to collect the image from the user. The prediction algorithm is used treat the image and estimated the cost for the user.

## **Components**

The project is based on the various components which helps to handle the back - end and Front - end. Then front - end is build using html and css which is connectedback - end which is build using the python and IBM cloud. The majore components used in the projects are listed below,

### **Deep Learning:**

Deep learning is part of a broader family of machine learning methods based on artificial neural networks with representation learning. Learning can be supervised, semi-supervised or unsupervised. Deep-learning architectures such as deep neural networks, deep belief networks, deep reinforcement learning, recurrent neural networks, convolutional neural networks and Transformers have been applied to fields including computer vision, speech recognition, natural language processing, machine translation, bioinformatics, drug design, medical image analysis, climate science, material inspection and board game programs, where they have produced results comparable to and in some cases surpassing human expert performance. The adjective "deep" in deep learning refers to the use of multiple layers in the network. Early work showed that a linear perceptron cannot be a universal classifier, but that a network with a

nonpolynomial activation function with one hidden layer of unbounded width can. Deep learning is a modern variation which is concerned with an unbounded number of layers of bounded size, which permits practical application and optimized implementation, while retaining theoretical universality under mild conditions. In deep learning the layers are also permitted to be heterogeneous and to deviate widely from biologically informed connectionist models, for the sake of efficiency, trainability and understandability, hence the "structured" part.

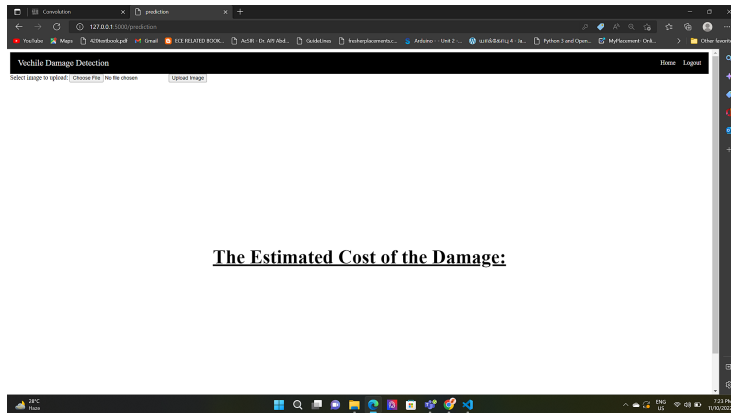
### **IBM Watson Cloud:**

IBM cloud computing emerged from the union of its mainframe computing and virtualization technologies. Known as the original virtualization company, IBM's first experiments in virtualization occurred in the 1960s with the development of the virtual machine (VM) on CP-40 and CP-67 operating systems. CP-67, a hypervisor used for software testing and development, enabled memory sharing across VMs while giving each user their own virtual memory space. With the machine partitioned into separate VMs, mainframes could run multiple applications and processes at the same time, making the hardware more efficient and cost-effective. IBM began selling VM technology for the mainframe in 1972.

### **Working**

The project is powered by the IBM Watson cloud and is based in the artificial intelligence field. With the use of HTML and CSS and the Watson Cloud, a responsive web application may be created. The database API key is gathered and connected with the front-end using flask, which is a python framework for designing the backend, in the cloud when a database service is used. To communicate with the web application, utilise pages like prediction.html, login.html, and logout.html. The Deep Learning model is build using the VGG16 which is present in the keras library and the model is trained with the images of mulitple car with various level cum types of damages. The model is deployed in the back-end using the flask and the prediction.html page is setted to collect the image from the user. The prediction algorithm is used treat the image and estimated the cost for the user.

The prediction page, takes the input as an image file and resize the image into 256 x 256 matrix. The resized image is feed in to the deep learning models for estimating the cost for various images. The predcition page is given belo



## Conclusion

Hence we conclude, by suggesting this web application because of its high accuracy in estimating the cost based on the damages in the car. The model is deployed in the back-end with the high quality User Interface in the front-end to ensure the proper reach to the user. The data is collected and secure properly in the IBM cloud and it can be used for future improvements.