PROJECT FLOW:

HTML BASED USER INTERFACE(UI):

User Interface (UI) is a series of pages, screens, buttons, forms and other visual elements that are used to interact with the device. Every app and every website have a user interface. The user interface property is used to change any element into one of several standard user interface elements. It allows the user to interact with content or software running on a remote server through a Web browser. The content or Web page is downloaded from the Web server and the user can interact with this content in a Web browser, which acts as a client.

DATA COLLECTION:

Data collection is the procedure of collecting, measuring and analyzing accurate insights for research using standard validated techniques.

A researcher can evaluate their hypothesis on the basis of collected data. In most cases, data collection is the primary and most important step for research, irrespective of the field of research. The approach of data collection is different for different fields of study, depending on the required information.

Dataset link: https://www.kaggle.com/arbethi/forest-fire?select=Dataset

This dataset is taken from the Kaggle where it has train and test image modules on both Fire and no Fire classes to make a perfectly balanced data package for both training and testing purpose.

IMAGE PREPROCESSING:

Pre-processing is a common name for operations with images at the lowest level of abstraction — both input and output are intensity images. These iconic images are of the same kind as the original data captured by the sensor, with an intensity image usually represented by a matrix of image function values (brightness). The aim of pre-processing is an improvement of the image data that suppresses unwilling distortions or enhances some image features important for further processing, although geometric transformations of images (e.g. rotation, scaling, translation) are classified among pre-processing methods here since similar techniques are used.

Applying Image Data Generator on trainset and test set:

• Image data augmentation is used to expand the training dataset in order to improve the performance and ability of the model to generalize.

• Image data augmentation is supported in the Keras deep learning library via the Image Data Generator class.

• How to use shift, flip, brightness, and zoom image data augmentation.

MODEL CREATION:

Deep learning is an increasingly popular subset of machine learning. Deep learning models are built using neural networks. A neural network takes in inputs, which are then processed in hidden layers using weights that are adjusted during training. Then the model spits out a prediction. The weights are adjusted to find patterns in order to make better predictions. The user does not need to specify what patterns to look for — the neural network learns on its own.

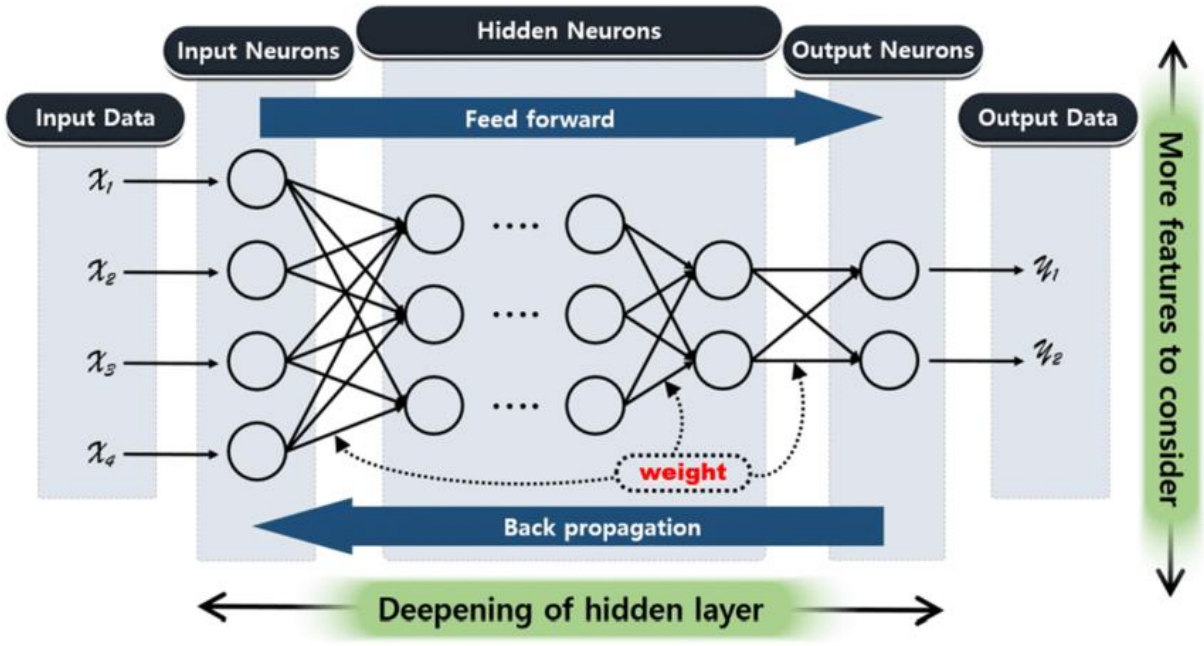

Figure:1 Deep learning Model

CNN LAYERS:

There are three types of layers that make up the CNN which are the convolutional layers, pooling layers, and fully-connected (FC) layers. When these layers are stacked, a CNN architecture will be formed. In addition to these three layers, there are two more important parameters which are the dropout layer and the activation function

• Convolutional Layer

• Pooling Layer

• Fully Connected Layer

• Drop Out

• Activation Functions

HIDDEN LAYERS:

Hidden layer(s) are the secret sauce of your network. They allow you to model complex data thanks to their nodes/neurons. They are “hidden” because the true values of their nodes are unknown in the training dataset. In fact, we only know the input and output.

SAVING THE MODEL:

Then we need to save the model in binary .h5 File format so that it can be called while developing the web application using flask or through Computer Vision.

APPLICATION BUILDING:

In the desktop window of your PC create a new folder (with any name) double click on the folder to enter, then right click and create a new txt file. After creating a txt file, right click on it, then select rename and change the .txt to .html to make it a HTML file.

BUILD PYTHON CODE:

Flask is a small and lightweight Python web framework that provides useful tools and features that make creating web applications in Python easier. It gives developers flexibility and is a more accessible framework for new developers since you can build a web application quickly using only a single Python file.

Flask uses the Jinja template engine to dynamically build HTML pages using familiar Python concepts such as variables, loops, lists, and so on. You’ll use these templates as part of this project.