Emerging Methods for Early Detection of Forest Fires
Pre-Requisites

Team ID	PNT2022TMID03809
Project Name	Emerging Methods for Early Detection of Forest Fires

Pre-Requisites:
To complete this project you should have the following software requirements:

Anaconda Navigator:

Anaconda Navigator is a desktop graphical user interface included in Anaconda Distribution that allows you to lunch applications and manage conda packages, environments, and channels without using command line interface commands. Navigator can search for packages on Anaconda .org or in a local Anaconda repository. It is available for windows, macOS, and Linux. For this project, we will be using python, tensor flow, keras, CNN extra… To build Deep learning models you require the following packages.

Python:

Python is a high-level programming language; it abstracts many sophisticated details from the programming code. Python focuses so much on this abstraction that its code can be understood by most novice programmers. Python code tends to be shorter than comparable codes. Python is a dynamic, high level, free open source and interpreted programming language. Our Python Numpy Tutorial provides the basic and advanced concepts of the Numpy.

NumPy in combination with SciPy and Mat-plotlib is used as the replacement to MATLAB as Python is more complete and easier programming language than MATLAB. Prerequisite Before learning Python Numpy, you must have the basic knowledge of Python concepts.

Tensor flow:

To install Tensor Flow, it is important to have "Python" installed in your system. Python version 3.4+ is considered the best to start with Tensor Flow installation. Consider the following steps to install Tensor Flow in Windows operating system. Following are the two **Tensor Flow — Convolutional Neural Networks.**

After understanding machine-learning concepts, we can now shift our focus to deep learning concepts. Deep learning is a division of machine learning and is considered as a crucial step taken by researchers in recent decades. The examples of deep learning implementation include applications like image recognition and speech recognition.

Important types of deep neural networks:
- ✓ Convolutional Neural Networks.
- ✓ Recurrent Neural Networks In this chapter, we will focus on the CNN, Convolutional Neural Networks.

Keras:

Keras runs on top of open source machine libraries like Tensor Flow, Theano or Cognitive Toolkit (CNTK). Theano is a python library used for fast numerical computation tasks. Tensor Flow is the most famous symbolic math library used for creating neural networks and deep learning models. Tensor Flow is very flexible and the primary benefit is distributed computing. CNTK is deep learning framework developed by Microsoft. It uses libraries such as Python, C#, C++ or standalone machine learning toolkits. Theano and Tensor Flow are very powerful libraries but difficult to understand for creating neural networks. Keras is based on minimal structure that provides a clean and easy way to create deep learning models based on Tensor Flow or Theano. Keras is designed to quickly define deep learning models. Well, Keras is an optimal choice for deep learning applications.

Open CV:

Open CV is a Python open-source library, which is used for computer vision in Artificial intelligence, Machine Learning, face recognition, etc.

In Open CV, the CV is an abbreviation form of a computer vision, which is defined as a field of study that helps computers to understand the content of the digital images such as photographs and videos.

Convolutional Neural Network:

Convolutional neural network is one of the most popular ANN. It is widely used in the fields of image and video recognition. It is based on the concept of convolution, a mathematical concept. It is almost similar to multi-layer perception except it contains series of convolution layer and pooling layer before the fully connected hidden neuron layer.

A convolutional neural network uses three basic ideas:

- Local respective fields

- Convolution

- Pooling