

# EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRE

## Project Flow

- Fire in a sparsely populated forest area and it is more difficult if the prediction is done using ground-based methods like Camera or Video-Based approach.
- The user interacts with a web camera to read the video.
- Once the input image from the video frame is sent to the model, if the fire is detected it is showcased on the console, and alerting sound will be generated and an alert message will be sent to the Authorities.
- Usage of the satellite images to observe, detect, and report fire events.  
Implementation of the wireless sensor networks to observe the fire events exist in all areas.

**To accomplish this, we have to complete all the activities and tasks listed below**

- Data Collection - data collection is the process of gathering, measuring, and analyzing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities.
  - Collect the dataset or create the dataset.
- Image Pre-processing - Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it.
  - Import ImageDataGenerator Library.
  - Define the parameters /arguments for ImageDataGenerator class
  - Applying ImageDataGenerator on trainset and test set.
- Model Building
  - Import the model building Libraries
  - Initializing the model
  - Adding CNN Layers
  - Adding Hidden Layer
  - Adding Output Layer
  - Configure the Learning Process
  - Training and testing the model
  - Optimize the Model
  - Save the Model
- Video Streaming and alerting
  - OpenCV for video processing

- Creating an account in Twilio service
- Use Twilio API to send messages.