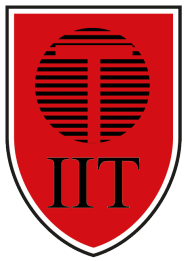


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# FireAI: Forest Fire Identification and Fire Behavioural Analysis Through Video Processing.

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# Abstract

Forests are the keepers of the planet's natural equilibrium. Unfortunately, forest fires are frequently only discovered after they have spread over a broad region, making control and extinguishment difficult, if not impossible, at times. Thousands of forest fires occur every year, resulting in significant species losses and financial costs. Many forest fires have been reported in recent years across the world, with the majority of them resulting in significant flora and wildlife losses. Even recovering from the scenario cost a lot of money.

The aim of building the forest fire detection and fire behavioural analysis system is to solve the fire spreading rate problem within a short amount of time. This system builds in order to identify the fire at different growth stages and also to calculate fire behavioural analysis report based on McArthur's (1969,1983) research, so the system will give an understanding to the user about how the fire is behaving and how it can be controlled. This system works by the training of different images of fire growth in the forest and several environmental variables at the different stages of growth. This system will show the fire spread rate, damaged area, temperature, humidity, moisture content and windspeed in the dashboard of the system.

This system performs really well in identifying the fires at different stages and also the calculations coming for fire behavioural analysis showed good accuracy. In the past works there were no system implemented to detect forest fire through computer vision and also to calculate the fire behavioural analysis report together. This system provides both the functionalities in order to give knowledge to the user how the fire spreads. Compared to past works this system works well in identifying the forest fire with minimum rate of false alarm.

**Keywords**: Deep learning, Computer Vision, Internet of Things, Convolutional Neural Network, Forest Fire.

**Subject Descriptor**

Hardware- Integrated circuits.

Theory of computation- FireAI algorithm.

Computer Systems organization- Real time Dashboard system.

Information systems- Image storage.

**Abbreviation**

IoT- Internet of Things

DL- Deep Learning

CV-Computer Vision

CNN-Convolutional Neural Networks

ANN-Artificial Neural Networks