

EMERGING METHODS
FOR EARLY DETECTION
OF FOREST FIRES
Literature Review

Sl.NO	TITLE	YEAR	OBJECTIVE	METHODOLOGY	BENEFIT
1	A survey on Forest Fire Detection	2015	To develop an appropriate detection system for detecting forest fire using image processing technique.	The techniques such as Wavelet decomposition, spatial and temporal analysis, Gaussian Mixture Model, Multi-Feature fusion detect fire in an accurate manner are implemented. Instead of sensors, detection is done using images.	Fire can be detected by using multiple stages as it is the fire indication. This processing technique is repeated for significant aspects for forest fire in an earlier phase.
2	Early Forest Fire Detection using Drones and Artificial Intelligence	2019	To prevent huge damages of forest fire by detecting the proper categorization of fire and fast response from firefighting departments.	The platform with Unmanned Aerial Vehicle (UAV) and it constantly patrol over the threats by fire areas. The UAV utilize benefits from AI. Based on the image and video input from drone camera, vision method recognition and detection of smoke as well as fire are detected.	No need of manpower as the system is controlled by Unmanned Aerial Vehicle. The system is that it has achieved 1.24 seconds for classification time with an accuracy of 91% and FI score of 0.91.
3	Automatic Early Forest Fire Detection based Gaussian Mixture Model	2018	To detect forest fire earlier and thereby preventing a huge damage.	Based on the slow spread of smoke, a time delay parameter improves Gaussian mixture model for extracting candidate smoke regions. Two motion features of smoke, rate of area change and motion style are used to select regions from the candidate regions.	The algorithm can judge whether there is smoke in each frame. By detecting smoke in time, many big losses can be avoided.
4	Image Processing Based Forest Fire Detection	2012	To propose a fire pixel classification for detecting the forest fire.	Fire watch tower are made to observe location throughout. Satellite based system are used to monitor large areas in forest. Instead of using camera images, videos are preferred in this process to calculate the spread of fire with time. Classification Error Matrix is used for referring data with result. The system also provides visual inspection capability that helps the aircraft crew to confirm the presence or absence of fire.	The proposed method has low error rate and lower false alarm rate. It is cheap in computation which helps in real time forest fire detection.
5	Early Fire Detection System using wireless sensor networks	2018	To predict forest fire using wireless sensor network	The Wireless Sensor Networks architecture is the most efficient and extensible one for simplifying the management of forest as well as communication.	The system is more precise than traditional surveillance approach. It is faster with the satellite surveillance.

6	A review on early forest fire detection system using optical remote sensing	2020	To fight with the forest fire occurring throughout the year with increased intensity in summer and autumn.	The optical remote sensing is used here which provides an extensive survey on both flame and smoke detection. Multi-sensor system used here covers wide areas and achieve higher accuracies by fusing data from different sensors. Several algorithms for detecting slow moving object, smoke colored region and smoke region smoothness are used in this.	The use of multi-feature fi offer more accurate result. Machine (SVM) classifier robustness of fire detection
7	Developing a real-time and automatic early warning system for forest fire	2018	To detect forest fire caused by human and climatic conditions.	Stand-alone boxes are used here which are deployed throughout the forest. It contains sensors and radio module to transmit data from sensors. Testing is done individually by X Bee modules and paired using XCTU Software.	The use of XBee and XCT prediction of forest fire in radio sensors sense the cha of second.
8	A Literature Study on Image Processing for Forest Fire Detection	2016	To implement the image-based forest fire detection technique using CMYK, RGB and YCbCr color model.	In this image-based processing technique forest fire detection is done using YCbCr color space effectively as it adopts rule-based color model due to its less complexity and effectiveness. It separates luminance from chrominance compared to other color spaces like RGB.	This method not only sepa but also separates high ten pixels by taking in to acco parameters of fire image i like mean and standard de