Emerging methods for Early detection of forest fires

S.NO:	TITLE OF THE PAPER	DETAILS OF THE PAPER	OBJECTIVES	METHODOLOGY USED	TAKE AWAY
1.	Early Forest Fire Detection Systems Using Optical Remote Sensing	Published on 2020	Large-scale forest fires are one of the most harmful natural hazards affecting climate change and life around the world. Thus, to minimize their impacts on people and nature	This paper presents an overview of the optical remote sensing technologies used in early fire warning systems and provides an extensive survey on both flame and smoke detection algorithms employed by each technology.	We use optical remote sensing systems for early fire detection, organized into three subsections for Terrestrial, Aerial and Satellite systems respectively.
2.	A Review of the Applications of Remote Sensing in Fire Ecology	published on 2019	Wildfire plays an important role in ecosystem dynamics and global processes. This paper provides a broad review of the applications of remote sensing techniques in fire ecology	SFM is a newer methodology which incorporates the use of photogrammetric techniques to construct 3-D 'point clouds' from a series of overlapping images. Although UAS-based research is an emerging technology, the data have been used for monitoring post-fire vegetation recovery, fire severity and fire detection	The integration of lidar and UAS technologies into vegetation recovery monitoring shows potential for increasing accuracy and temporal resolutions

3.	Early Detection of Forest Fire Using Mixed Learning Techniques and UAV	Published on 2022.	Forest fires are increased due to deforestation and global warming. Many trees and animals in the forest are affected by forest fires .To propose deep learning techniques to predict forest fires, which would be cost-effective.	The video input is captured from the camera, and the other inputs such as wind speed, wind directions, and IR image sensing are calculated using the sensors mounted on the UAV for navigation. These images are provided as input to the deep learning models, and it checks for the existence of the fire.	From this journal, we use maximum take-off weights (MTOW) assess the UAV payload capacity at different heights above the ground. The battery used on the UAV reserves the UAV in GPS-enabled environments for 107 minutes of duration, whereas on the GPS-disabled environment, maximum flight time is 87 minutes.
4.	Early Detection of Forest Fire Based on Unmaned Aerial Vehicle Platform	Published on 2019 IEEE	Once the fire happening in forest is not found in time, it can cause a huge loss. Accurate real-time monitoring of forest fires is not only an important part of forest fire prevention, but also an important means to effectively control the spread of forest fires and reduce economic losses.	The drone is a highly mobile inspection tool. An unmanned aerial vehicle is equipped with optical and infrared composite loads. It can be inspected according to a fixed route. It can also check the area of interest to meet the needs of forest fire detection.	Fire detection method, this method uses optical and infrared data to conduct fire discrimination, which enhances the robustness of the discrimination results. Besides, we use the frame difference method in the smoke detection method proposed in this paper. This method is only effective when the drone is hovering.

5.	Automatic Early Forest fire Detection based Gaussian Mixture Model.	Published 2018 IEEE	To avoid the huge damage of forest caused by fires.	Based on the slow spread of smoke, firstly a time delay parameter improves Gaussian mixture model for extracting candidate smoke regions. Then, two motion features of smoke, the rate of area change and motion style are used to select smoke regions from the candidate regions.	From this journal, we use Gaussian mixture model. Because it can reconstruct background with the advantages of small storage space, adaptive learning and good noise toleration.

Reference:

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