Literature Survey

Date	23 October 2022
Team ID	PNT2022TMID23834
Project Name	Emerging Methods for Early Detection of Forest fire
Maximum Marks	4 Marks

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 using Drones and Artificial Intelligence.	Published on 2019	To detect forest fires early, the proper categorization of fire and fast response from the firefighting departments.	The fire detection is based on a platform that uses Unmanned Aerial Vehicles (UAVs) which constantly patrol over potentially threatened by fire areas. The UAVs utilize the benefits from Artificial Intelligence (AI). This allows to use computer vision methods for recognition and detection of smoke or fire, based on images or video input from the drone cameras.	From this journal, we use drone cameras and UAVs, because it patrols the forest always.

2.	A review on early forest fire detection system using optical remote sensing	published on 2020	To fight forest fires occurring throughout the year with an increasing intensity in the summer and autumn periods.	Detection methods that use optical sensors or RGB cameras combine features that are related to the physical properties of flame and smoke, such as color, motion, spectral, spatial, temporal, and texture characteristics.	From this journal, we use modern optical sensor networks which are known for their long range communication capabilities and extremely suitable for sensor and telemetry applications.

3.	Developing a real-time and automatic early warning system for forest fire.	Published on 2018 IEEE.	To detect forest fires causing by climatic conditions and also caused by human.	The method using here is making use of stand-alone boxes which are deployed throughout the forest. Those boxes contain different sensors and a radio module to transmit data received from these sensors. Each sensor will be tested in individually and XBee modules are configured and paired using XCTU Software.	From this journal, we use Software solutions which are used for implementing microcontroller kits and to simulate and designing circuit boards.

4.	Early Fire Detection System using wireless sensor networks.	Published on 2018 IEEE.	To detect fires from huge cause of forests.	The hierarchical architecture of Wireless Sensor Networks is most efficient and extensible for dense networks which simplifies the management of the forest as well as the communication and the localization of fire and sensors.	From this journal, we use cluster heads as landmark for the rest of sensor for localization in order to define their GPS coordinates according to the cluster head's coordinate.
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:

1) Tanase, M.A.; Aponte, C.; Mermoz, S.; Bouvet, A.; Le Toan, T.; Heurich, M. Detection of windthrows and insect outbreaks by L-band SAR: A case study in the Bavarian Forest National Park. Remote Sens. Environ. 2018, 209, 700–71

2) Bu, F.; Gharajeh, M.S. Intelligent and vision-based fire detection systems: A survey. Image Vis.

Comput. 2019, 91, 103803.

3) Muhammad, K.; Ahmad, J.; Mehmood, I.; Rho, S.; Baik, S.W. Convolutional neural networks based fire detection in surveillance videos. IEEE Access 2018, 6, 18174–18183. [CrossRef]

4. Shen, D.; Chen, X.; Nguyen, M.; Yan, W.Q. Flame detection using deep learning. In Proceedings of the 2018 4th International Conference on Control, Automation and Robotics (ICCAR), Auckland, New Zealand, 20–23 April 2018; pp. 416–420.

5) . Wickramasinghe, C.; Wallace, L.; Reinke, K.; Jones, S. Intercomparison of Himawari-8 AHIFSA with MODIS and VIIRS active fire products. Int. J. Dig. Earth 2018

This is some of reference is referred for creating a leture survey.