LITERATURE SURVEY

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Team ID	PNT2022TMID30674
Domain Name	Artificial Intelligence
Project Name	Emerging Methods for Early Detection of Forest Fires
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S.NO	TITLE	AUTHOR	ABSTRACT
1.	Emerging methods for early detection of forestfires using unmanned aerial vehicles (UAV)	IJARIT JOURNAL SARVESH PATIL GAURAV TAWDE MIDHUN NAIR	For ultimate a few many years unmanned aerial vehicles (UAV) are getting used to a amazing quantity in lots of functions like army surveillance, remote sensing, etc. Unmanned Aerial Vehicles (UAVs) are gaining a lot of impetus in the recent times. Drones are constantly being made available for a myriad of day-today applications like food delivery, surveillance, farming, etc. one among the most overshadowed regions in the list of applications remains to mine. Mining may be a dangerous activity and more often than not, there are certain unknown hazards there to that are too dangerous for humans to be experimenting with all by themselves. Hence it is sensible to use a UAV in the form of a First-Person View (FPV) drone. For the event of a UAV, there are thousands of various permutations that can be used.

| 2. | A Review on Early Forest Fire Detection Systems using Optical Remote Sensing | PANAGIOTS BARMPOUS PERIKLIS PAPAIOANNOU KOSMAS DIMITROPOUS NIKOS GRAMMALIDIS | The environmental challenges the world faces nowadays have never been greater or more complex. Global areas covered byforests and urban woodlands are threatened by natural disasters that have increased dramatically during the last decades, in terms of both frequency and magnitude. Large-scale forest fires are one ofthe most harmful natural hazards affecting climate change and life around the world. Thus, to minimize their impacts on people and nature, the adoption of well-planned and closely coordinated effective prevention, early warning, and response approaches are necessary. 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. Three types of systems are identified, namely terrestrial, airborne, and spaceborne-based systems, while various models aiming to detect fire occurrences with high accuracy in challenging environments are studied. Finally, the strengths and weaknesses of fire detection systems based on optical remote sensing are discussed aiming to contribute to future research projects for the development of early warning firesystems. |

| 3. | A framework for useof wireless sensor networks in forest fire detection and monitoring | YUNUS EMREASLN

IBRAHIM KORPO GLU | Forest fires are one of the main causes of environmental degradation nowadays. Current surveillance systems for forest fires lack in supporting real-time monitoring of every point of a region at all times and early detection of fire threats. Solution using wireless sensor networks, on the other hand, can gather sensory data values, such as temperature and humidity, from all points of a field continuously, day and night, and, provide fresh and accurate data to the fire-fighting center quickly. However, sensor networks face serious obstacles like limited energy resources and high vulnerability to harsh environmental conditions, that have to be considered carefully. In this paper, we propose a comprehensive framework for the use of wireless sensor networks for forest fire detection and monitoring. Our framework includes proposals for the wireless sensor network architecture, sensor deployment scheme, and clustering and communication protocols. The aim of the framework is to detect a fire threat as early as possible and yet consider the energy consumption of the sensor nodes and the environmental conditions that may affect the required activity level of the network. We implemented a simulator to validate and evaluate our proposed framework. Through extensive simulation experiments, we show that our framework can |

			provide fast reaction to forest fires while also consuming energy efficiently.
4.	Forest fire detection using machine learning	PRAGAT SEJAL SHAMBHUWANI PIYUSHA UMBRAJKAR	Detection of forest fire should be fast and accurate as they may cause damage and destruction at a large scale. Recently, Amazon forest confronted a devastating forest fire which remained obscured for over 15 days. Hence resulting in huge loss of ecosystem and adversely affecting the global conditions. As the technology is developing, Wireless Sensor Networks (WSN) is gaining importance in recent research areas as it has shown its usefulness in warning disasters and save lives. As soon as an unusual event is noticed in the networks, an event is detected through the sensor devices placed at distributed locations. This event detection information is passed to the base station and decision is taken. Due to the static configuration of such sensor data in WSN generally lead to false alarm generation. In such a scenario we can use machine learning algorithms to prevent false alarm since they get configured efficiently in dynamic nature, that too automatically. Therefore for eliminating the static essence of WSN, we present a machine learning algorithm imbibed with WSN.

5.	Forest Fire Modeling and Early Detection using Wireless Sensor Networks	MOHAMED HEFEEDA MAJID BAGHERI	Early detection of forest fires is the primary way of minimizing their damages. We present the design of a wireless sensor network for early detection of forest fires. We first present the key aspects in modeling forest fires according to the Fire Weather Index (FWI) System which is one of the most comprehensive forest fire danger rating systems in North America. Then, we model the forest fire detection problem as a node k-coverage problem ($k \geq 1$) in wireless sensor networks. We propose approximation algorithms for the node k-coverage problem which is shown to be NP-hard. We present a constant-factor centralized algorithm, and a fully distributed version which does not require sensors know their locations. Our simulation study demonstrates that our algorithms: activate near-optimal number of sensors, converge much faster than other algorithms, significantly prolong (almost double) the network lifetime, and can achieve unequal monitoring of different zones in the forest.

6.	Forest Fire DetectionSystem	SANGJOON CHA CHRIS CANTU PEDRO CANTU JOSE FLORES DR. NANTAKAN WONGKASEM DR. HEINRICH FOLTZ	The world is burning. As global warming continues to display a statistical rise in global average temperatures and various environmental factors continue to contribute to the rise in forest fires, the need for a wireless detection system to recognize these fire hazards and that can successfully alert the necessary first responders is becoming more and more apparent. Such a detection and alert system would be able to potentially save billions of dollars in property, infrastructure, and environmental costs and damages, preserve wildlife habitats and ecosystems that are directly affected by forest fires, and prevent the displacement of countless families from their homes that neighbor forested areas and regions. Therefore, we have come together as an engineering team to propose and develop a prototype solution to these issues using our acquired technical knowledge as senior electrical engineering students for our senior design project this semester. In summary, we aim to reduce the social, economical and environmental impacts brought by forest fires.