FUNCIONAL REQUIREMENT:

* The model outperforms the other techniques in terms of detecting in the early stage. However, this model is sensitive to the forest with dense fogs and clouds. This is because smoke appears as the same as fog, and the model may misclassify the fog as smoke.
* Regardless of the reasons for the ignition of the forest fires, they usually cause devastating damage to both nature and humans. Forest fires are also considered as a main contributor to the air pollution, due to that during every fire huge amounts of gases and particle mater are released in the atmosphere.  Currently, there are many different solutions to fight forest fires.
* These solutions mainly aim to mitigate the damage caused by the fires, using methods for their early detection. As our future works, focus to meet practical detection and meet the necessity of early detection including the generation of the mixed reality model of the forest fire area that gives more information, and prevention analysis will be made easy.
* we have briefly presented for early forest fire detection, including part of their characteristics and main components. We have also analysed some of the benefits, which these methods can provided, but they show great potential and work on their development and improvement.  Several different scenarios for the possible use of the drones for forest fire detection will be presented and analysed, including a solution with the use of a combination between a fixed-wind and a rotary-wing UAVs.
* Emerging technologies give the science new alternatives to develop compact, economic, accessible, and functional proposals for early warning about this phenomenon. The UAVs also utilize the benefits from Artificial Intelligence (AI) and are equipped with on-board processing capabilities. This allows them to use computer vision methods for recognition and detection of smoke or fire, based on the still images or the video input from the drone cameras.
* Then, various methods and systems in forest fires prediction and detection systems are reviewed. Besides works that reported fire prediction and detection systems, studies that assessed the factors influencing the fire occurrence and risk are discussed. The main issues and outcomes within each study are presented and discussed.
* Artificial Intelligence is one of the key research techniques which several researchers have analysed and proved to be the best in improving the performance of detecting fire hazard in smart cities. In this research, a Deep Belief Network (DBN) with Recurrent LSTM Neural Network (R-LSTM-NN) is proposed for prediction of big data that are collected from smart cities based on IoT.
* Moreover, the proposed model mainly concentrates in predicting the fire hazard values that gathered from smart cities using IoT devices. The simulation results show that the proposed technique proves to be better when compared with other existing techniques in terms of accuracy, precision, recall, and F-1 score. 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 fire systems.
* 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.