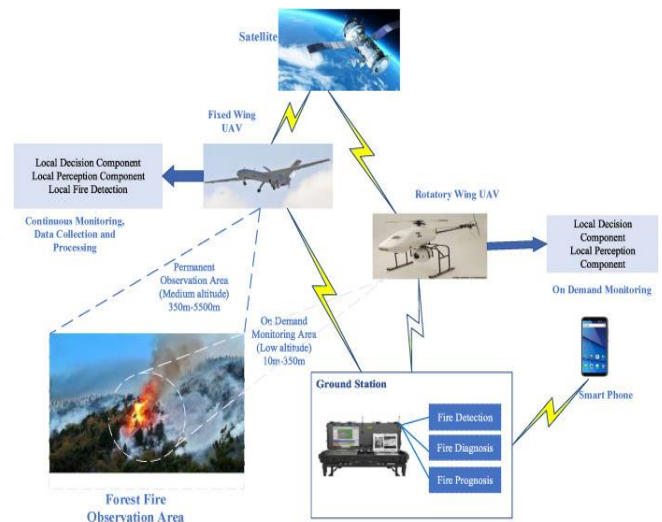


# EMERGING METHODS FOR EARLY DETECTION OF FOREST FIRES

## LITERATURE:

Forest fires pose a serious threat to biologically healthily grown forests and environmental protection in addition to tragically causing the loss of life and precious natural and individual properties, including thousands of hectares of forest and hundreds of houses. Thousands of forest fires break out annually across. Unimaginable calamities occur around the world. The research interest for this topic is many years; there are numerous, thoroughly researched solutions available for testing or even prepared for application to tackle this issue. Aim. An overview of all the technologies that have utilised to identify forest fires with thorough studies of the methodologies and procedures employed in this application. There are numerous techniques and tools for research accessible on the market. For better comprehension, the document offers instances of research experiment outcomes, all the procedures, and a few market product methods. Result. Each method has benefits and drawbacks of its own. Following each category, a thorough discussion is given. Conclusion. The comparison of the four approaches is summarised in a detailed table at the conclusion. Forests guard the natural equilibrium of the planet. Unfortunately, the forest fire is typically only discovered after it has already consumed a significant amount of land, making control and suppression difficult and occasionally impossible. As a result, there will be catastrophic loss and irreparable harm to the environment and atmosphere (30% of the carbon dioxide (CO<sub>2</sub>) in the atmosphere is a result of forest fires) [1] as well as ecological harm (due to the enormous amounts of smoke and CO<sub>2</sub> in the atmosphere). Long term negative repercussions of forest fires include influence on regional weather patterns, global warming, and the

extinction of rare species of flora and animals, among other terrible consequences.



The issue with forest fires is that they frequently occur in remote, abandoned, or poorly managed regions that are full of trees, timber that is dry and parched, leaves, and other materials that serve as fuel. These substances combine to create a highly flammable substance that serves as both fuel for the fire's development and the ideal environment for its initial ignition. The fire ignition may result from human actions like smoking or having a barbecue or from natural causes like a hot summer day's high temperature or a broken glass acting as a collective lens that concentrates sunlight on a small spot for an extended period of time, igniting the fire. Combustible material can easily ignite a fire once it has started, causing it to spread broader and bigger from its centre. Normal terminology for the early stage of ignition is "surface fire." This could result in the fire spreading to nearby trees and becoming larger and larger until it becomes "crown fire". Depending on the topography and the current weather, the fire usually grows out of control at this point and the damage to the landscape may become extensive and linger for a very long period.

### Existing Solutions:

- <https://www.bosch.com/stories/early-forest-fire-detection-sensors>

### Reference:

- <https://ieeexplore.ieee.org/document/8534245>