Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	14 October 2022
Team ID	PNT2022TMID39552
Project Name	Project –Emerging Methods For Early Detection of Forest Fire
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	**Classification**	There are four classifications of fire cause: accidental, natural, incendiary, and undetermined
FR-2	**Tagging**	It is a classification task with a higher degree of precision. It helps to identify several objects within an image. It tags and tracks animals and forest situations
FR-3	**Localization**	The localisation of the node would be done using satellite communication to reduce coverage holes and ensure maximum range with the least latency. This node would communicate data to a monitoring station with its location and send alerts according to the sensed thresholds breached based on the novel logic algorithm.
FR-4	**Detection**	The system, using Moderate Resolution Imaging Spectro-Radiometer (MODIS), Advanced Very High Resolution Radiometer (AVHRR), and Spinning Enhanced Visible and Infra Red Imager (SEVIRI) data, provides near real-time integrated information about both the fire presence and danger over the affected area
FR-5	**Semantic Segmentation**	Semantic segmentation describes the process of associating each pixel of an image with a class label. It includes Sentinel-1, Sentinel -2, Sentinel-3 and MODIS.
FR-6	**Instance Segmentation**	In Instance Segmentation, bounding boxes are generated for each instance of multiple categories present along with the object segmentation masks. It includes Hydrology, Rivers, Lakes and Audio weather conditions.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Earlier fire detection methods such as satellite and optical systems can cover areas; satellite systems identify infrared signatures, while optical systems look for smoke plumes. These systems,can offer an inexpensive alternative to help detect forest fires
NFR-2	**Security**	As this process is designed with a minimum delay, the fire can be detected within the initial stage, and the responsible parties can take necessary actions in a shorter period, which will minimize the damage. This ensures security of well beings.
NFR-3	**Reliability**	The system shall be supervised either electrically or with satellite or even by software-directed polling of field. The panel, detectors and modules shall preferably used.
NFR-4	**Performance**	The performance parameters of fire detection systems are given as conditional probabilities. These parameters are identified by the objective analysis of the functions of a fire detection system. It is demonstrated that using the false alarm rate to specify the malfunctioning of a threshold detection system is inadequate. The principal function of fire detection systems is identified as the notification of anti-fire agents of the probability of unwanted fires
NFR-5	**Availability**	By making field testing ,Threshold ratio analysis it ensures minimum up time and performance
NFR-6	**Scalability**	By analysing thermal and spectral bands of Satellite provides need for solution with minimal challenges