

## PROBLEM STATEMENT

Team ID	PNT2022TMID10960
Project Name	Project – Industry-Specific Intelligent Fire Management System
Maximum Marks	2 Marks

- The smart fire management system includes a Gas sensor, Flame sensor and temperature sensors to detect any changes in the environment.
- Based on the temperature readings and if any Gases are present the exhaust fans are powered ON.
- If any flame is detected the sprinklers will be switched on automatically.
- Emergency alerts are notified to the authorities and Fire station.
- In the recent past, a few fire warning and alarm systems have been presented based on a combination of a smoke sensor and an alarm device to design a life-safety system.
- However, such fire alarm systems are sometimes error-prone and can react to non-actual indicators of fire presence classified as false warnings.
- There is a need for high-quality and intelligent fire alarm systems that use multiple sensor values (such as a signal from a flame detector, humidity, heat, and smoke sensors, etc.) to detect true incidents of fire.
- An Adaptive neuro-fuzzy Inference System (ANFIS) is used in this paper to calculate the maximum likelihood of the true presence of fire and generate fire alert.
- The novel idea proposed in this paper is to use ANFIS for the identification of a true fire incident by using change rate of smoke, the change rate of temperature, and humidity in the presence of fire.
- The model consists of sensors to collect vital data from sensor nodes where Fuzzy logic converts the raw data in a linguistic

variable which is trained in ANFIS to get the probability of fire occurrence.

- The proposed idea also generates alerts with a message sent directly to the user's smartphone.
- Our system uses small size, cost-effective sensors and ensures that this solution is reproducible.
- MATLAB-based simulation is used for the experiments and the results show a satisfactory output.