

Industry-specific intelligent fire management system

LITERATURE SURVEY

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.

Keywords: multi-sensor, fire detection and warning system, adaptive neuro-fuzzy interference system (ANFIS)