Sensors to monitor air quality during fires by detecting the smoke and ash particles in the air and the toxic gasses emitted from the fires.....

- Metal oxide semiconductor (MOS) sensors: MOS sensors are a type of gas sensor that can detect a variety of gases, including carbon monoxide, nitrogen dioxide, and hydrogen cyanide.

- Particulate matter (PM) sensors : PM sensors are devices that measure the concentration of particulate matter in the air, it can measure the concentration of PM2.5 in the air. PM2.5 is a type of PM that is less than 2.5 micrometers in diameter and is considered to be the most harmful type of PM to human health

PM sensors are typically optical sensors that use light scattering to measure the concentration of PM in the air. When light hits a PM particle, the light is scattered in all directions. The amount of light that is scattered depends on the size and concentration of the PM particles in the air. PM sensors measure the amount of light that is scattered and use this information to calculate the concentration of PM in the air.

Sensors to detect fires and monitor their movement

- Microbolometer arrays: Microbolometer arrays are uncooled infrared sensors that are made up of a grid of microbolometers, which are tiny resistors that change their electrical resistance when they are exposed to infrared radiation.

- Quantum well infrared photodetectors (QWIPs): QWIPs are also uncooled infrared sensors, but they are more sensitive than microbolometer arrays. QWIPs are also more expensive and more difficult to use, but they can be a good choice to detect very small fires.

Sensor to measure the humidity in the air during fires

- Sensirion SHT3x: The SHT3x is a capacitive RH sensor that is accurate and reliable for measuring the amount of water vapor in the air relative to the maximum amount of water vapor that the air can hold at a given temperature.

The SHT3x is a very accurate sensor, with a temperature accuracy of ±0.3°C and a humidity accuracy of ±2% RH.

Sensors for identifying the materials that are burning in a fire

These camera sensors provide high-resolution hyperspectral images, which can be used to identify the materials that are burning in a fire, as well as other environmental information.

- SpecTIR hyperspectral camera

  It has a spectral range of 400 to 2500 nanometers and the ability to capture images in 256 spectral bands.

- Micro-Hyperspec hyperspectral camera

The Micro-Hyperspec hyperspectral camera has a spectral range of 400 to 1000 nanometers and can capture images in 32 spectral bands