



No Fear Fire – An outdoor Fire Detection System

Remo Andreoli, Marco Cardia, Riccardo Paoletti

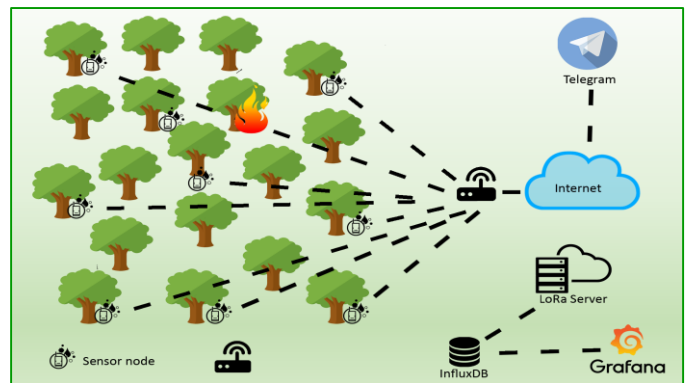
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CONTEXT AND PROBLEM DESCRIPTION

Italy is one of the most affected countries in Europe, as shown by Corpo Forestale dello Stato's database. Our purpose is to help the authorities fighting the environmental damage caused by the fire, which often is not detected rapidly, causing the destruction of large wooden areas and the killing of the local wildlife. We aim to face these problems by deploying a wireless sensor network that early detects fires and helps handling the hazard.

SYSTEM ARCHITECTURE

Each sensor node senses data and sends them to the gateway node through a LoRaWAN infrastructure. The Gateway Node aggregates all data, stores them in an InfluxDB database and run a Grafana server that allows to show data in a web page. In case of fire an alert is sent through Telegram using ethernet connection.



TECNOLOGIES

Raspberry Pi 2 as Gateway Node: receives data from sensor nodes, stores them into a influxdb database and, if necessary, sends a message through a Telegram bot;

Raspberry Pi 3 as Sensor Node: gathers data from the transducers and sends them to the gateway through LoRaWAN;

CCS811 sensor: Co2 Sensor, connected to the sensor node;

DHT11 sensor: Temperature and Humidity, put on the sensor node.



PROTOTYPE AND DEMONSTRATION

In the demo we will show how once a fire is detected, the alarm is sent to a telegram bot to alert the authorities. In particular our sensor node will send data to the gateway that will store them in a influxdb database, and show them through grafana. If the values satisfies some conditions, a message is sent to a telegram bot.

FUTURE WORK

A possible future upgrade will consist of implementing on the sensor nodes some actuators to fight the fire as soon as possible, for example with tools for applying hazard reduction burning techniques.

Another possible improvement would be the introduction of some heat cameras to better detect the fires.