Wireless Forest Sentry

UCSB Capstone Project | Senseeker Engineering Inc.

Senseeker Engineering Inc. provides silicon IP, IC and image sensor design and systems engineering all targeted at the unique needs of the scientific and infrared image sensor community. We specialize in the design of digital imaging sensors and readout integrated circuits for hybrid image sensing arrays. We are located in the Santa Barbara, CA, area amid the west coast's hub of infrared and scientific image sensor companies. For more information visit Senseeker.com.


Project Description

8,527 California wildfires have burned down 1,893,913 acres in 2018 alone, causing damages in the billions of dollars. Traditional methods of detecting wildfires have consisted of public reporting, foot patrols, and air patrols. These are semi-randomized methods that only increases chances of discovery as the fire grows and spreads. Minor improvements have been made by utilizing technology such as space-based infrared, using infrared imaging on foot and aerial patrols, and predicting high risk areas to patrol with analytics. We are proposing another solution to this problem, a wirelessly integrated mesh network of fire detection modules that can collectively monitor large areas, and decrease the need for patrols. It is our hope that this system can be implemented to reduce the time before a fire is detected and enable firefighters to jump into action to save our forests.

Project Objective

Create a fire detection system that will consist of a fire detector and a wireless communication node that can send and receive data. For example, one implementation could be a smoke detector attached to a Zigbee node. Incorporate these nodes into a distributed mesh network that will be able to relay data to a centralized computer. An important area of focus should be on power consumption, as the device will need either a long battery life or be run off solar power. The ultimate deliverable should be designed to not disturb the natural environment in which it will ultimately be used.
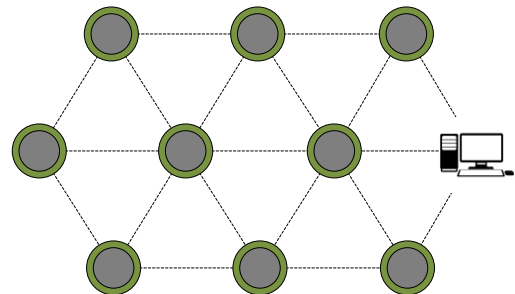
Project Deliverables

Two or more fire detection units that can alert a central computing unit through a mesh network when fire is detected.

Preferred Student Qualifications

Background in electronics
Interest in wireless systems, networking, and sensors
Experience in programming

Assets Available to Students

Engineers at Senseeker Engineering Inc.