



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

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| Name(s) Jahan Razavi | Project Number J0923 |
| Project Title PyroVision: A Detection System for Wildfires | |
| <div><div>Objectives/Goals The purpose of this project was to create a wildfire detection system to reduce chances of a large blaze. PyroVisions detects the temperature and wirelessly sends it to the fire station. A grid system enables firefighters to know the location of each PyroVision without the need for GPS.</div><div>Abstract</div><div>Methods/Materials The main materials that I used were the TMP37 temperature sensor, Arduino, nrf24l01 Bluetooth transmission module, and red LEDs. I created four transmitters to represent the four corners of an acre, and one receiver to represent the fire station. I lowered the threshold in the code such that touching and holding the temperature sensor can turn on the corresponding LED. I tested the transmitters and receiver in a park that was clear or had trees. I also used both the original and a modified antenna on the receiver to check the range increase.</div><div>Results The transmission range with the original antenna was less than with the modified one. The data showed that the transmission distance in an area with trees with the modified antenna was an average of around 200 feet. In an area without trees, also with the modified antenna, the transmission distance ranged from 300-400 feet. My aim was to reach around 208 feet in range, the minimum transmission distance to allow datahopping.</div><div>Conclusions/Discussion In conclusion, I accept my hypothesis because the system had fairly good transmission distance. If I were to extend this system to hundreds of acres, I would, to save battery, turn on the transmitters for 0.1 second, and off for 2 minutes. I would also add a dipole antenna to the transmitters to increase the range. The transmitters would use datahopping to transmit across hundreds of acres: one transmitter sends its data to the next, which combines the two, sends the combined data to the next, and so on.</div></div> | |
| Summary Statement PyroVision senses high heat that corresponds to a fire, wirelessly sends the data to the nearest fire station, alerting the firefighters if the threshold is passed. | |
| Help Received I got part of code off Arduino Info on how to use Bluetooth module; my father taught me how to solder. | |