

Fire Risk Alert System

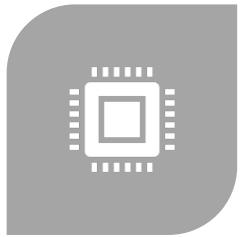
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AGENDA



BACKGROUND
D



IoT MODEL



RESULTS



APPLICATION

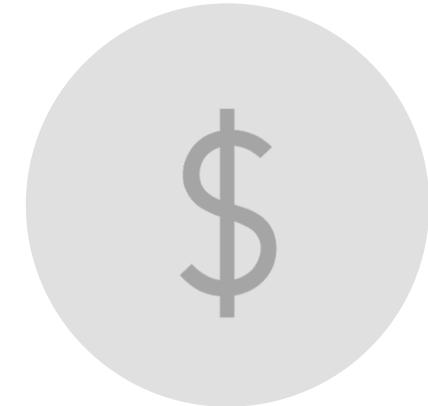


SUMMARY

BACKGROUND



IN 2018, THERE WERE **8,527** FIRES WHICH
BURNED, A TOTAL OF **1,893,913** ACRES.
THE LARGEST AMOUNT OF BURNED
ACREAGE RECORDED IN A FIRE SEASON.

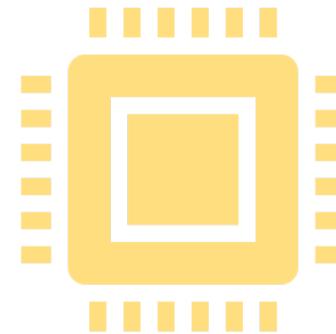


THE FIRES HAVE CAUSED MORE
THAN **\$3.5 BILLION** IN DAMAGES,
INCLUDING \$1.792 BILLION IN FIRE
SUPPRESSION COSTS.

GOALS



Understand class concepts about IoT systems and incorporate them into a fire alert system for wildfire prevention.



Research and develop a solid understanding of Raspberry Pi and the sensors used in everyday IoT systems.

PROBLEMS



Forest fires are dangerous and prevalent
in the summer months.



Campers and hikers should know when
there is a high risk to starting a campfire
or riding OHVs in grassy areas.

PROPOSED SOLUTIONS



Fires are more likely to spread when humidity is low and temperature is high.

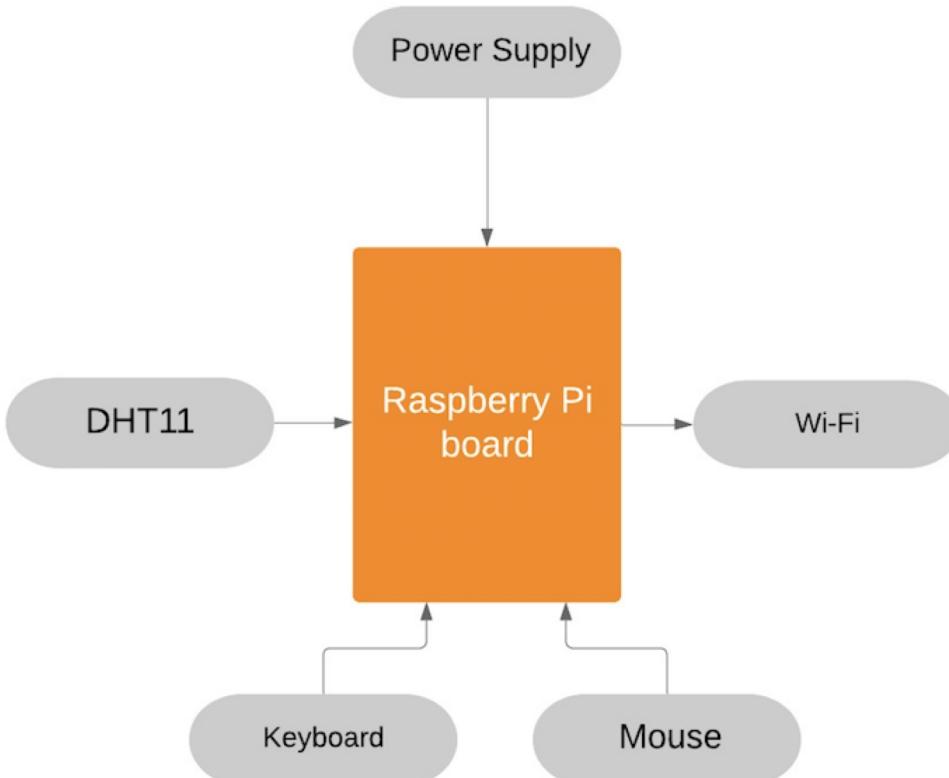


Monitor the humidity and temperature of areas prone to forest fires in order to inform users of the risk.



Continuous humidity and temperature detection with an interface for users to check the status.

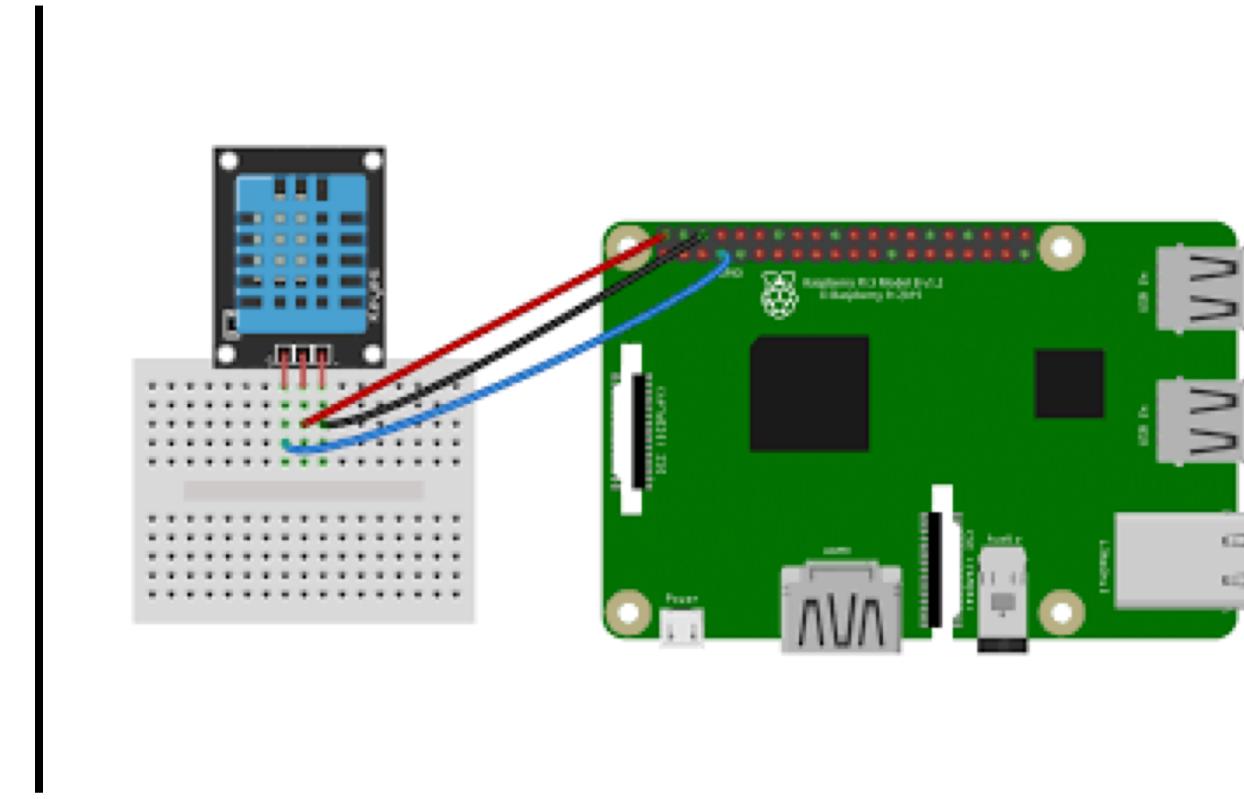
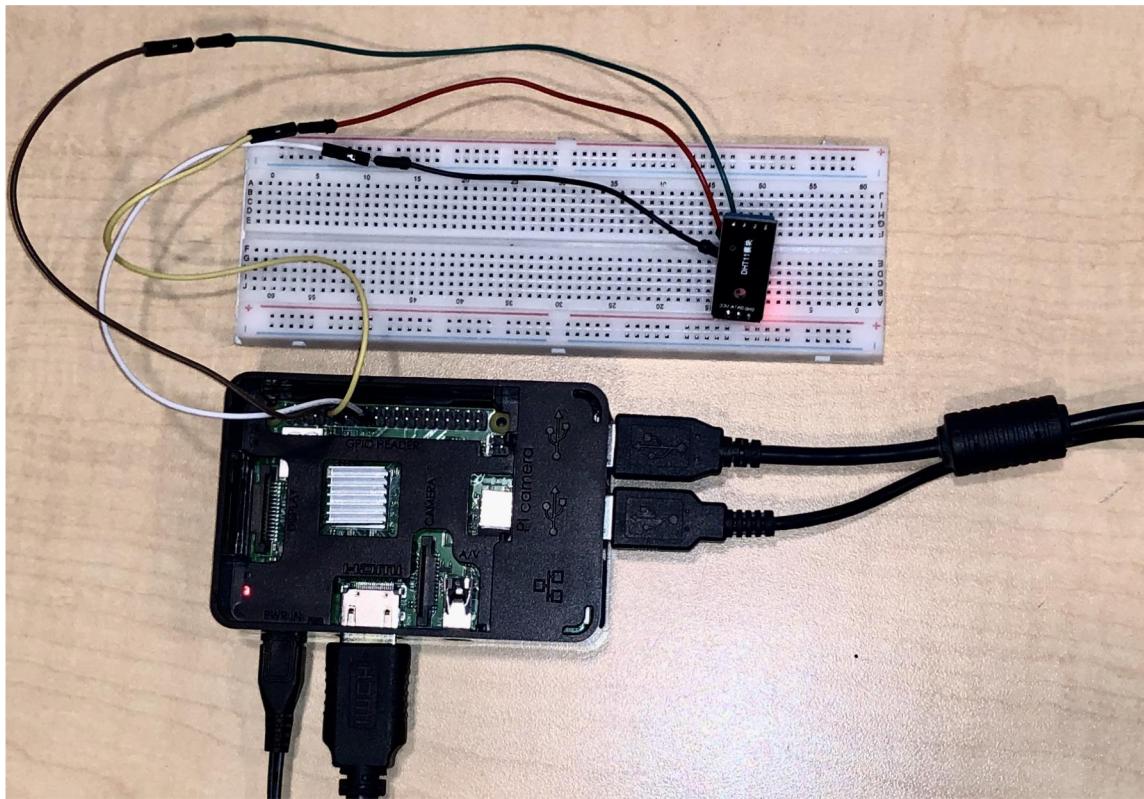
SYSTEM BLOCK DIAGRAM



BILL OF MATERIALS

NAME	COUNT
DHT11	1
Raspberry Pi board	1
Breadboard	1
Keyboard	1
Mouse	1
Monitor	1

BLOCK SETUP LAYOUT



ThingSpeak

Channel Settings

Percentage complete 30%

Channel ID 788578

Name Environment monitoring

Description

Field 1 Temperature (C)

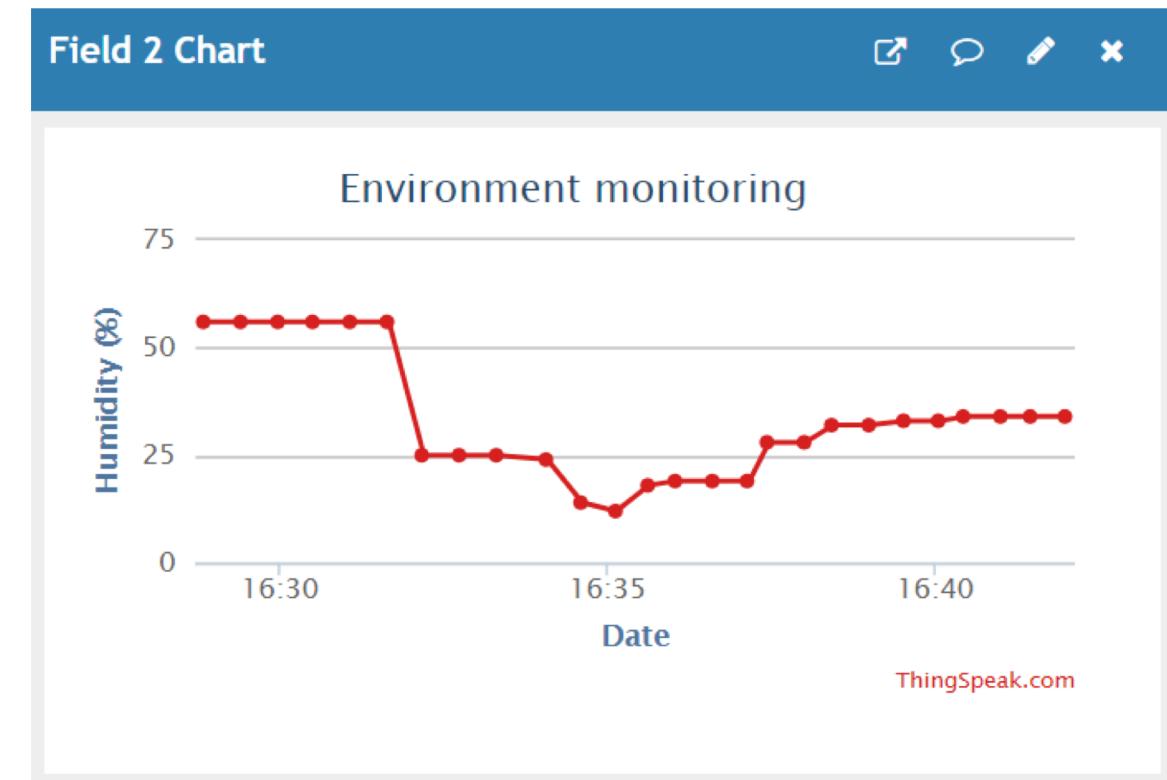
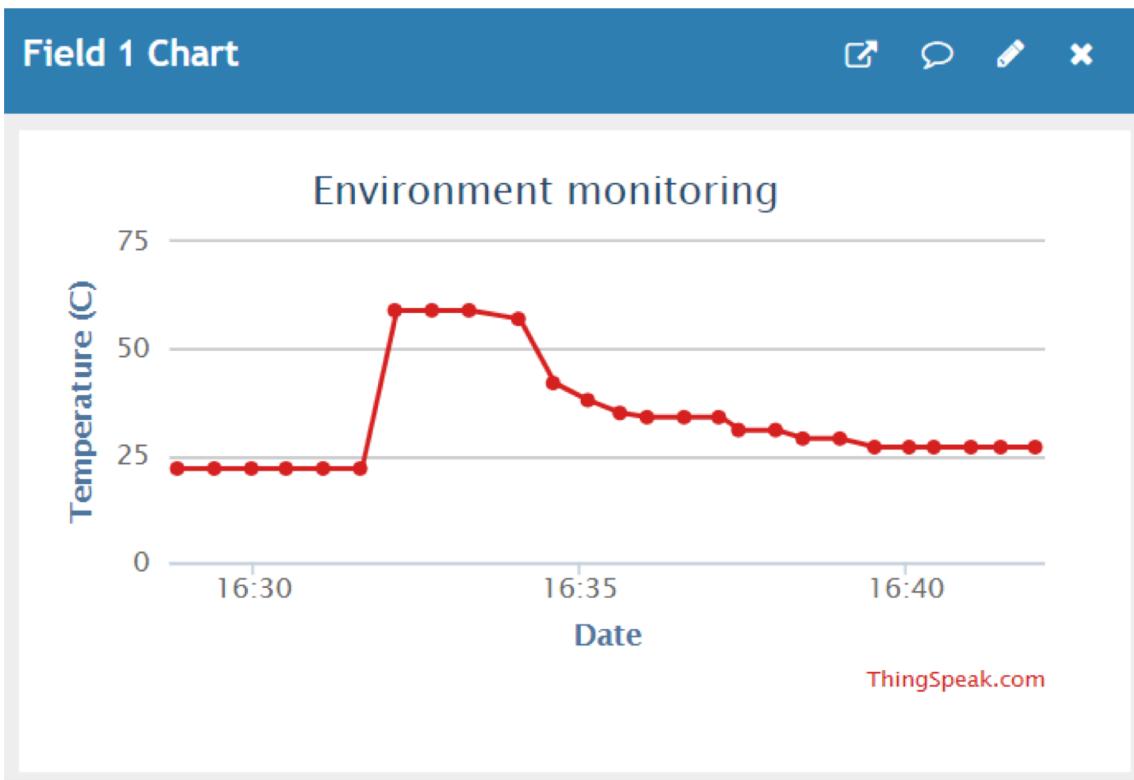
Field 2 Humidity%

Field 3

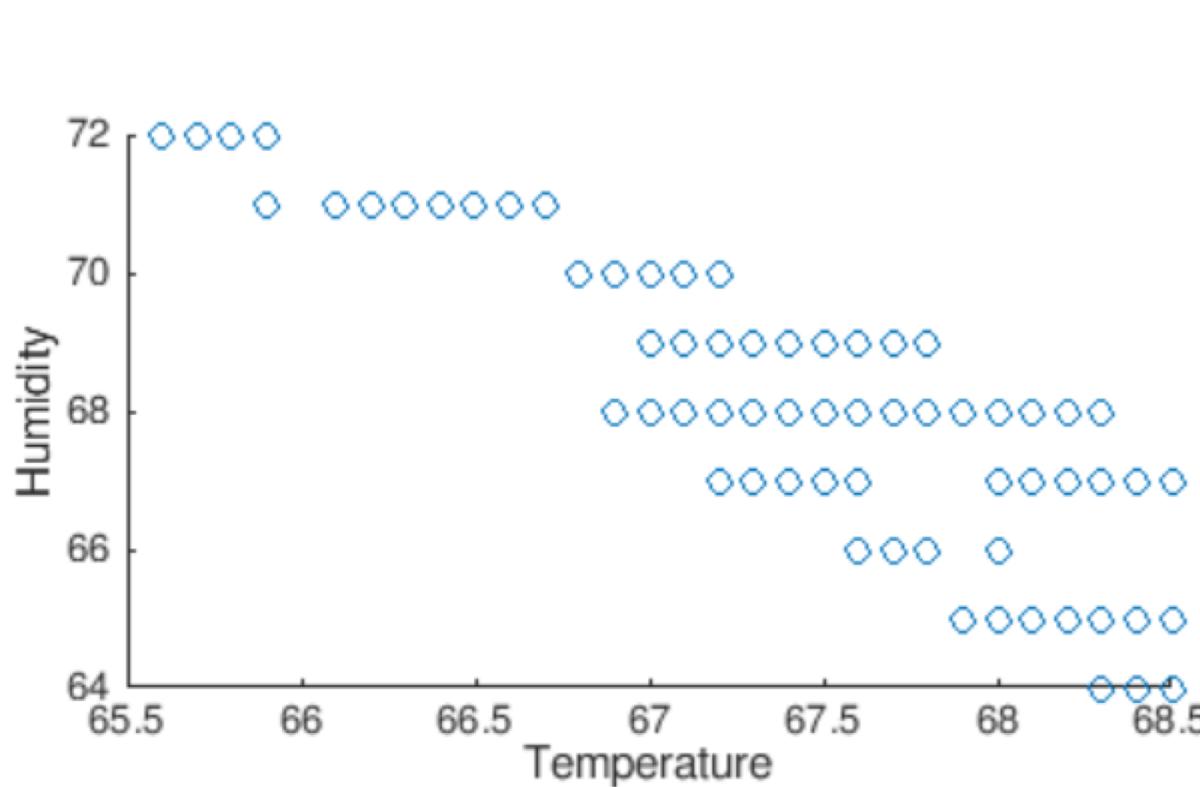
Field 4

Field 5

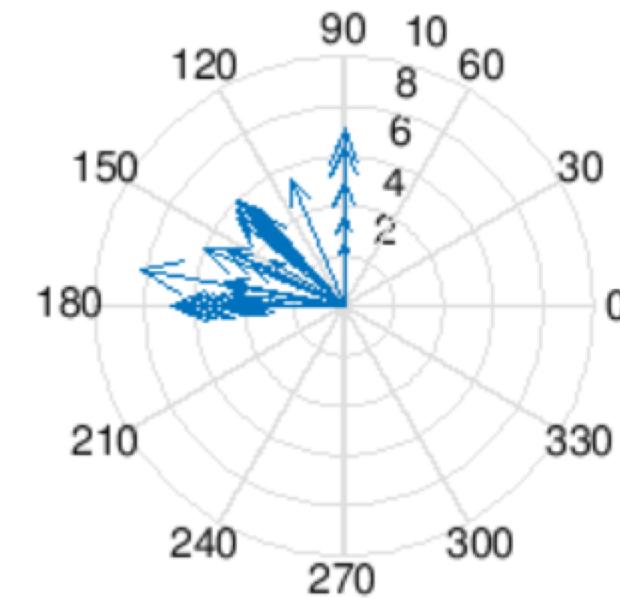
EXPERIMENTS & RESULTS



ThingSpeak Analysis



Correlation

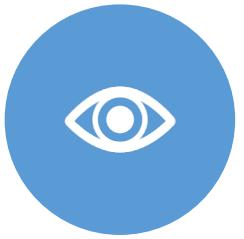


Directional data

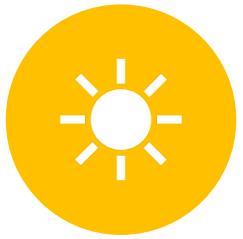
CONCEPT



LOW (GREEN)
FIRE STARTS ARE UNLIKELY.



MODERATE (BLUE)
SOME WILDFIRES MAY BE EXPECTED.



HIGH (YELLOW)
WILDFIRES ARE LIKELY.



VERY HIGH (ORANGE)
FIRES START EASILY FROM ALL CAUSES AND MAY SPREAD FAST.



EXTREME (RED)
FIRES WILL START AND SPREAD RAPIDLY.

APPLICATIONS



Better detection of the possibility of fires in order to prevent future catastrophic wildfires.



Inform App users of current conditions so they can take necessary precautions to prevent wildfires.

SUMMARY

- Low cost and efficient way of mitigating and preventing wildfires
- Easy to install and maintain
- Collecting data overtime would give a more accurate threshold prediction for the conditions that would foster a fire
- Long term goal: integrate an app that allows users to remotely access the information from their smartphones
 - Implement devices in National Forests to inform hikers and campers of current conditions

Thank you





Q & A |