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Forest Monitoring and Fire Detection System

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Abstract: Forest fires/Wildfires are the most common disaster in forests which lead to severe destruction of forest wealth, natural habitat and bio-diversity. Our concept is to create a system which will help in early detection of forest fire by measuring natural factors which lead to forest fire. Our Forest Monitoring and Fire Detection System uses various sensors like heat, smoke, wind, temperature and humidity to predict and detect forest fire on an early basis. The sensors are connected to Esp8266 wi-fi module which after detecting sends data to cloud. The cloud then sends the data to the website. The website displays an alert so that immediate action can be taken. Early detection and preventive measures are necessary to protect forests from fires which will be done using this system.
*Keywords: Alert, Biodiversity, Cloud, Early detection, Forest Wealth, Monitoring, Sensors*

I. INTRODUCTION

Forests cover one third of Earth's land. Forests are habitat to more than half of world's land-based species of animals, plants and insects. Apart from this, around 1.6 billion people depend on forests for their livelihood. Forest fires/Wildfires are the most common disaster in forests which lead to severe destruction of forest wealth, natural habitat and bio-diversity. A forest fire, wild fire, bushfire, wildland fire or rural fire is an unplanned, uncontrolled and unpredictable fire in an area of combustible vegetation. Natural factors such as atmospheric temperature, humidity, wind, lightning, etc. cause forest fires. In our forest monitoring and fire detection system, sensors such as atmospheric temperature sensor, humidity sensor, smoke sensor, flame senor and rain sensor connected to the ESP8266 will detect and collect the information about these factors. This data will be sent to cloud and it will analyze it and upload it on the website. This will help in early detection of forest fire and enable the authorities to take immediate action and prevent destruction.

II. METHODOLOGY/EXPERIMENTAL

1) Changes in natural factors of forest are sensed by the sensors.
2) The values are generated as electric signal and given to ESP8266.
3) ESP8266 sends the data to ThingSpeak cloud network.

The data is analysed by cloud is collected from cloud and displayed on website.
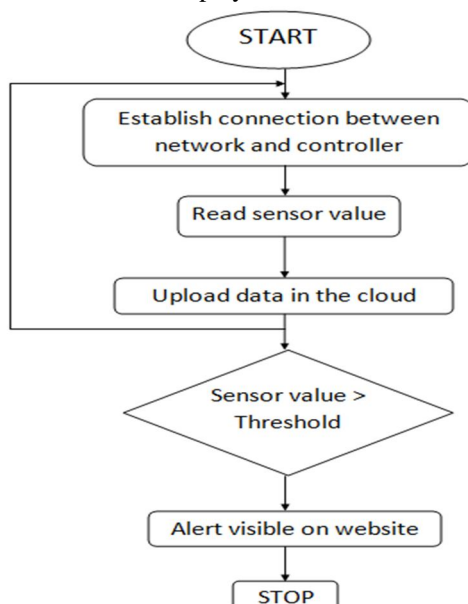
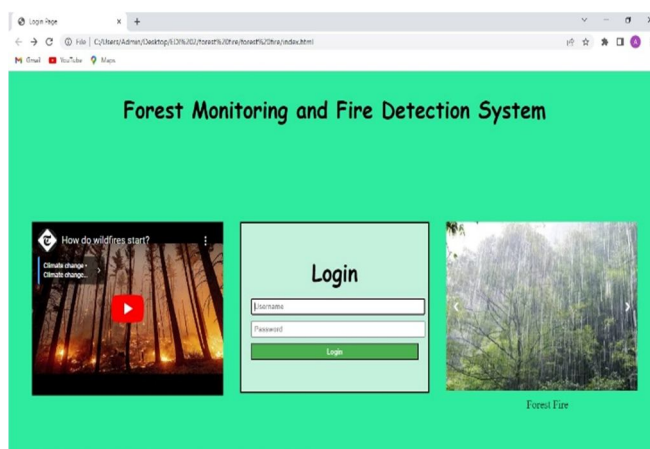ThingSpeak is used in the system for analyzing the data and giving alert on the website.

ThingSpeak is an IoT analytics platform service that allows to aggregate, visualize, and analyze live data streams in the cloud.
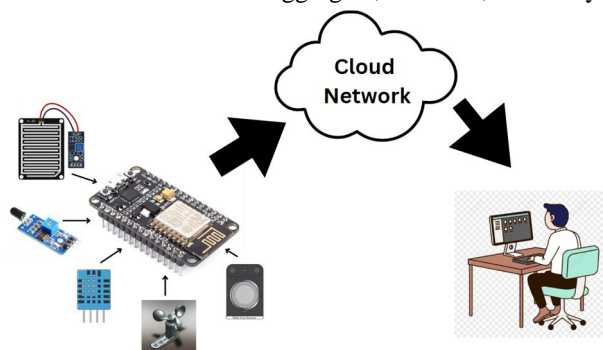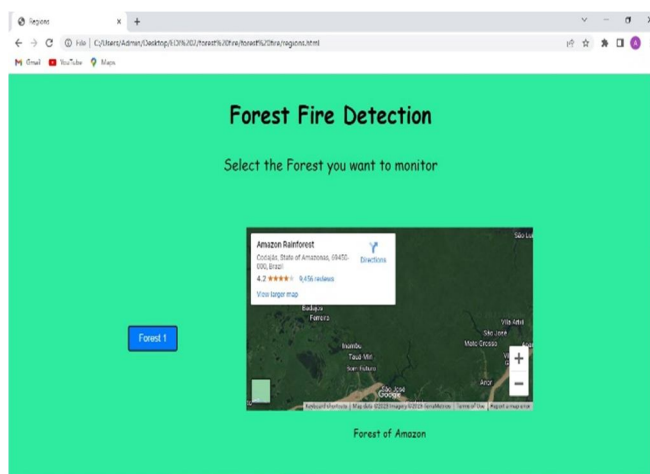

III. RESULTS AND DISCUSSIONS

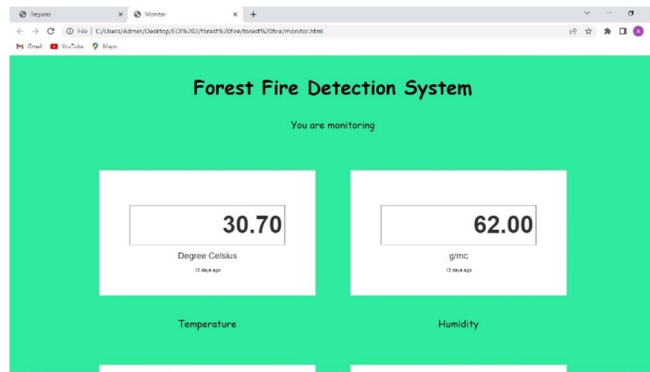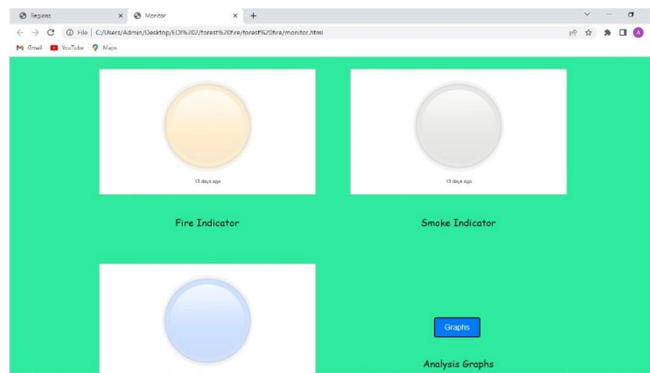The website of the fire monitoring system will look as follows :-
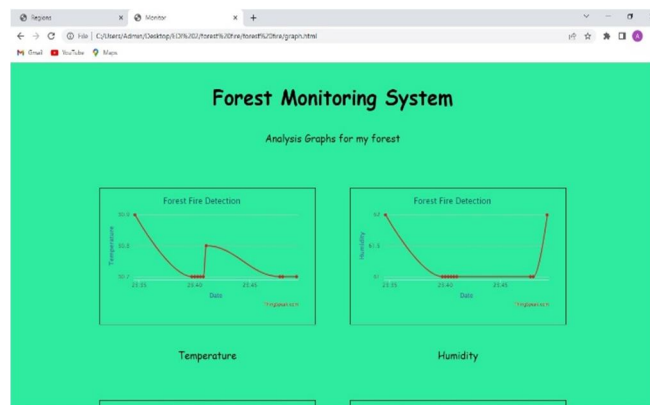
A. Login Interface

B. Map

C. Readings

D. Alerts

E. Graphs

The website displays the login interface, map for knowing the location of forest, readings, alerts, graphs for analysis, etc.

IV. FUTURE SCOPE

This forest monitoring and fire detection system will give updates in the form of messages and phone calls using the GSM SIM module.

V. CONCLUSION

Our forest monitoring and fire detection system will help in early detection of forest fires caused due to natural factors like high atmospheric temperature, low humidity, wind etc. This will enable the authorities to take immediate and proper actions to stop or curb the forest fire. This will lead to the protection of wildlife and environment.

VI. ACKNOWLEDGEMENT

REFERENCES

[1] P Raghavendra Reddy; P Kalyanasundaram (2022). "Novel Detection of Forest Fire using Temperature and Carbon Dioxide Sensors with Improved Accuracy in Comparison between two Different Zones", 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM).

[2] Anamika Chauhan; Sunil Semwal; Rajneesh Chawhan (2013). "Artificial neural network-based forest fire detection system using wireless sensor network ", 2013 Annual IEEE India Conference (INDICON)

[3] Vignesh. S; Tarun.m. G; Sankhasubhra nandi; Sriram. m; Ashok. p (2021). "Forest fire detection and guiding animals to a safe area by using sensor networks and sound", 2021 4th international conference on computing and communications technologies (iccct).

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