

An Enhanced IoT Based Rainforest Protecting and Alerting System

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Abstract: The process is described around wood smuggling such as sandalwood, red sandalwood, and the drug "sagwan". This tree is very expensive and not found worldwide. They can be used not only in medicine, but also in cosmetology and medicine. It costs a lot of money to sell these forests, so there is a lot of loss and wood smuggling. Certain measures must be taken to stop this poaching and save forests around the world. The smuggling/theft of the most important timber in the forest, such as sandalwood, poses a threat to forest resources, causing serious damage and ultimately catastrophic for the global environment. The main objective of the project is to use microelectromechanical (MEMS) technology and vibration sensors to plant special trees such as sandalwood for the Forest Service using renewable solar energy. be careful. This project presents a microcontroller-based anti-poaching system that can detect thieves by monitoring vibrations caused by tree/branch fall with a 3-axis MEMS accelerometer using Wireless Sensor Network (WSN) technology do it. When the tree changes, a loud sound lets you know that the tree is breaking deep in the forest. In this article, six basic functions such as detection (cutting), fire detection, human detection, location detection, passive infrared sensor (PIR) are important for forest management), GPS sensors. The concept of IoT-based forest security is divided into two parts, firstly, sensor data is collected from forest areas. The second is a Python based system that receives SMS and captures addresses, processes, analyzes and sends them to security personnel, workers or forest workers. The system supports e-government forestry.

I. INTRODUCTION

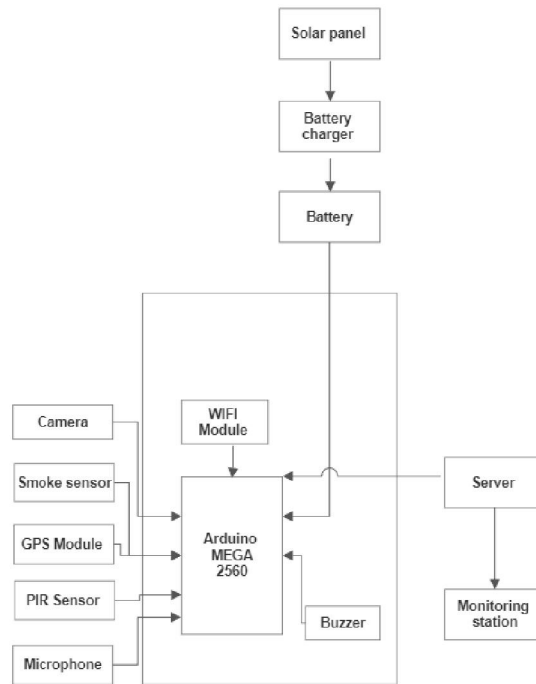
Reports of looting of sandalwood, sagwan and other trees have been circulating in the newspapers for days. This tree is very expensive and not found worldwide. They are used in pharmacy and cosmetics. Because selling these forests has a price, most of the trees are cut down and kidnapped. Some measures must be taken to stop this smuggling and save forests around the world. Establish mechanisms that can stop this type of smuggling. The project is about avoiding trees and wildlife. Living today requires understanding the value of wood. The presence of trees creates a vacuum. Trees provide valuable oxygen, so protecting trees is very important in today's life.

The proposed project in the Forest Tree Protection System Based on Wireless Sensor Networks is divided into three parts: tree division, area and management. It has a transmitter and a receiver. Each tree is equipped with a small electronic device that includes a microcontroller, two sensors and a radio frequency module. The main idea presented in this paper is to design a portable wireless sensor node that is part of a wireless sensor network. Not only can it detect intruders when mounted on each wooden body, it can also trigger an alarm at any time and send it via wireless media to a remote station.

The project showcases three controls that protect wood from smugglers and use renewable energy. The system works well with batteries powered by natural sunlight as it produces less electricity. H. Solar panel, rechargeable. Use solar energy to charge the node batteries, do not change the batteries too often.

The system is designed to stop this human This should prevent deforestation, maintain the ecological balance and solve the problem of global warming. The system consists of a tree with three sensors attached to the tree. The wooden room will be the main room where the system will be used. This unit protects wood from collision, fire, etc. It contains three ideas to protect. The purpose of this document is to create a warning to prevent smuggling of the most important woods such as sandalwood, sandalwood, sagwan and other valuable products.

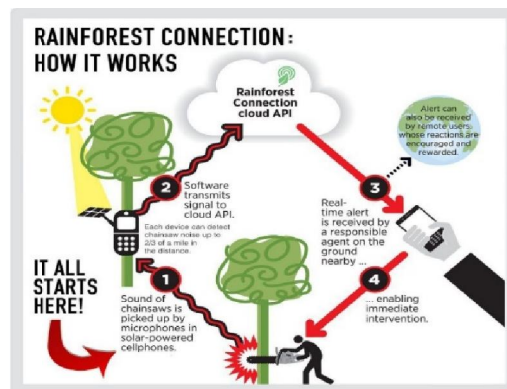
The planning process uses technology to prevent trees from being cut down. fire etc. Sending location information to higher authorities allows for a quick response in the event of a smuggling or fire threat.



Figures

Rainforest Protecting and Alerting System:

The scalable cloud and data architecture developed by Hitachi Vantara will also help Rainforest 19 Connection build a regional neural network that supports biodiversity. Rainforest Connection catalogs and creates acoustic data for hundreds of species in the area, and uses artificial intelligence and machine learning to better identify sounds, protect wildlife, and create recommendations so you know how to better protect the land. Rainforest Connection has developed the world's first real-time measurement system for the conservation and exploration of remote ecosystems. Unlike visual navigation systems such as drones and satellites, the RFCx relies on acoustic sensors that monitor ecological noise in selected locations 365 days a year. The sensor hears the sound of the recorder and sends a signal or data to the microcontroller, which reads this data to the server. The same data from the sensors is sent to the Thingspeak cloud, and the data part of the data is sent to the city or state forest department.

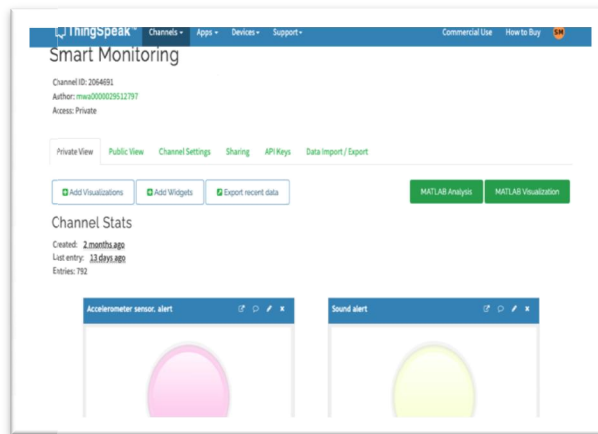


Rainforest Protection System Parameters

1. Capturing And Understanding a Vast Soundscape of Rainforest Audio

The first step to securing a threat landscape is understanding what's going on there. That's not easy in the rainforests of the world, which often span millions of acres. Hitachi and Rainforest Connection collaborated to design and build a solution that collects acoustic data from deep in the rainforest. Once the comprehensive soundscape has been achieved, the next step is to understand the expansion of this space by separating the sounds associated with decision making from the sounds of animals, insects and plants. "We looked at ways in which all the dedicated people at Hitachi could be involved in what we do," said Topher White, CEO and founder of Rainforest Connection.

"We know we need more experts to build the next cloud architecture and they are there to help us. But they also have great ideas to think about ways to support knowledge.



2. Ensuring proactive Protection for the Rainforest before it's too late

Before illegal loggers start their operations, they often send someone scouting in the forest to find the best locations. The algorithm that Hitachi has developed with Rainforest Connection allows the organization to listen to the forest and identify when a scout gets there. Hitachi can help Rainforest Connection detect the scout, not the chainsaw and send authorities into the area to intercept loggers before the damage is done.



How This System Helps to Preserve Rainforests?

Advantages:

1. Prevent Illegal Deforestation

The main mission of this project is to enable us to protect forest land. The system sends real time alert for chain saws, trucks, vehicles and signs of encroachment.

2. Halt Animal Poaching

This project can help prevent terrorism by providing real-time information and activity patterns that protect our systems in critical areas. This is because every animal is very important in the nutrition of all living things.

3. Enable Bio-Acoustic Monitoring

Tropical rainforests are much more than that. Our bioacoustics monitoring capabilities have given us a new way to understand tropical forests. It helps us create shared, searchable music sound and ecological knowledge.

For example.

The song of every bird the chirping of an insect, the rustle of leaves and raindrops, bird, the chirping of an insect, the rustle of leaves and raindrops.

4. Detects New Species of Animals

There are cameras with a 24/7 live monitoring system in the project. Using this camera, people can observe many things in the forest and capture new animals if they appear in the forest.

II. CONCLUSION

This IoT-based rainforest protection has many applications to protect the forest from illegal logging and animal poaching. In addition to this application, it is also possible to search for new animals existing in the forest through the camera because there are still some animals in the forest that no one knows about. Thus, with the help of cameras, if an animal is rarely seen or captured by the camera, that new animal can be studied or investigated. Forests and the products they provide are universally essential to the continuation of human life as we know it. Transforming our society to one that is free of forests and the benefits associated with them will require a drastic change that many of us consider not worth further research.

Therefore, given this problem we must find a strategy to manage the forest sustainably in order to reap all the benefits that the forest can provide. The loss of forest resources crosses national borders and affects the whole world. Considering this situation, the role of organizations has become important to minimize the negative impact and increase efficiency. Government, NGOs, cooperative groups, etc. should work more together to solve the problems facing the forest so that projects can develop their business in a timely and rapid manner. In most cases, cooperation will provide a solution that benefits everyone; for example, this project uses the cloud to store data and send notifications to the human forest, so this is also real-time collaboration and more efficient than construction put aside the power. Communities around the world are beginning to accept the fact that humans as a species need forest resources – the timber and non-timber products that managed forests can provide. Our performance as guardians of these resources has improved to date. It is crucial that we back up this information and ensure that we manage forests sustainably for future generations. Only a long-term international commitment to conservation and sustainable development can reverse the trend of unmanaged forests.

III. FUTURE SCOPE

The rainforest protection technology of the future will continue to evolve with innovations in new IoT-based devices used in this project, such as microphones that cover the surrounding area to prevent rainforest trees from being cut down. Therefore, there are many advanced technologies foreseen by many engineers in the future or some technologies are being worked on. In other words, the range of this microphone that we will use in the future will also increase, so we can cover a large area, and this reduces the cost of additional nodes in that area.

Conservation of rainforests will allow science and technology to evolve to create more and more precise technology. In the future, it will also be possible to reuse old phones, use microphones to record audio data, or use solar panels and lithium-ion batteries for charging. Scientists continue to study deeply and develop this rainforest protection technology to meet the different needs of protecting the environment and nature, which is so important to all living things.

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