Forest fire monitoring: The main goal of the project is to create an application for monitoring and visualizing forest fires on the Earth's surface in real time.

"Forest fires pose a serious threat to both the environment and the lives and property of people. They can spread rapidly and become uncontrollable if not detected and contained in time. The 'Forest Fire Monitoring from Space' project is designed to utilize modern space technologies for the detection, monitoring, and prevention of forest fires."

Project Goal:

To create a monitoring and response system for forest fires using satellite data and modern data analysis technologies.

Key Components:

1. Detection: Utilizing satellite imagery for continuous monitoring of forested areas at high risk of fires.

2. Analysis: Developing machine learning algorithms for accurate fire classification and threat assessment.

3. Notification: Automatically alerting firefighting services and coordinating actions through communication systems.

4. Monitoring: Continuous tracking of fire dynamics and forecasting their progression.

5. Public Information: Providing the public with access to real-time data and recommendations.

Project Advantages:

- Swift detection and response to fires.

- Minimization of damage to nature and human life.

- Enhancement of safety for the population and service personnel.

- Contribution to environmental sustainability.

Conclusion:

The "Forest Fire Monitoring from Space" project aims to effectively combat fires by utilizing advanced technologies and data analysis to protect nature and ensure the safety of society.

This is important for several key reasons:

Preservation of Environmental Balance: Forests play a crucial role in maintaining the ecological balance on Earth. They provide oxygen, absorb carbon dioxide, and serve as habitats for numerous species of animals and plants. Forest fires disrupt ecosystems, leading to a decrease in biodiversity and soil quality.

Protection of the Environment: Forest fires release a substantial amount of carbon dioxide and other harmful substances into the atmosphere, exacerbating climate change and air pollution. This is detrimental not only to the environment but also to human health.

Safety of People and Property: Forest fires pose a significant threat to the lives and property of people, especially those living near forested areas. They can lead to evacuations and the destruction of homes, as well as endanger the health and lives of individuals.

Economic Losses: Fires can cause substantial economic damage, including the loss of forest resources, agricultural lands, and infrastructure. This can have a long-term impact on regions dependent on the forest industry.

Contribution to Prevention and Management: Monitoring and responding to forest fires help prevent their occurrence and rapidly contain them, reducing their destructive impact. Preventing forest fires becomes critically important in the face of changing climate conditions and the increased frequency and intensity of natural disasters.

Overall, effective forest fire management is essential for the preservation of nature, human health, and the resilience of society and the economy.

Source 1: https://www.skyrora.com/using-satellites-to-monitor-wildfires/

Data on forest fires using satellite imagery.

This source provides information and data on how satellite technology is utilized to observe and monitor forest fires. These data may include details about the location, scale, and intensity of fires, as well as any changes in the surrounding environment caused by the fires. This is vital information that can be used for more effective firefighting and minimizing the impact of these fires on the environment and society.

Source 2: http://surl.li/lyiim

Information on how satellites are used for forest fire monitoring.

This source offers a comprehensive explanation of how satellites and their technologies are employed for the detection, monitoring, and management of forest fires. It may encompass details on the types of satellites used for this purpose, the kinds of data they gather (such as thermal images, visible light, and infrared imagery), and how this data is analyzed using modern technologies like machine learning and image processing algorithms. This will help the audience gain a better understanding of the significance and effectiveness of satellite usage in forest fire monitoring and control.

Source 3: <http://surl.li/lyizu>

Additionally, we have leveraged the open NASA database for monitoring forest fires. This valuable resource provides access to a wealth of satellite imagery and related data, which greatly enhances our ability to monitor and analyze forest fire activity across the globe. By collaborating with NASA and tapping into their extensive collection of Earth observation data, we can further improve the accuracy and effectiveness of our forest fire monitoring efforts.

Interactivity: The user can interact with the 3D model of the Earth, displaying information about forest fires, explore and analyze the data.

Main characteristics:

• Visualization of the Earth in 3D.

• Displaying textures of the Earth's surface.

• Visualization of data on fires on the Earth's surface.

• Interactive monitoring and analysis of fire data.

Additional future features:

• Real-time tracking of forest fires.

• Notifications and warnings about new fires.

Source 1: http://surl.li/lyiim

This source provides information on the statistics of forest and steppe fires over the past three years. The data includes the number of fires, their locations, scale, and intensity. Analyzing this statistics allows for identifying trends in fire development, determining areas at high risk, and assessing the level of damage caused by these fires. Access to such information is crucial for effective planning of prevention and firefighting measures.

Source 2: https://www.skyrora.com/using-satellites-to-monitor-wildfires/

This source presents information on how satellites and their technologies are used for the detection, monitoring, and management of forest and steppe fires. These satellites are equipped with various sensors, such as infrared and thermal cameras, which enable the detection of thermal sources characteristic of fires. Data obtained from satellites allows for the timely detection of fires at their early stages, determining their locations, and monitoring their dynamics. This significantly enhances the effectiveness of firefighting efforts and helps reduce damage to both nature and humans.

The combined use of information from both sources enables a more comprehensive and accurate analysis and management of the situation regarding forest and steppe fires, ultimately contributing to improved safety and the preservation of natural resources.

Satellites used for forest fires, such as Diptychs:

1. Detect thermal radiation from fires.
2. Identify smoke and gas emissions.
3. Analyze changes in vegetation and soil.
4. Provide detailed images of fires and their consequences.
5. Create maps of fire boundaries.
6. Monitor the dynamics of fire development over time.

This data provides assistance in the region with fires and takes into account their consequences.

Satellites detect fires in the early stages and provide information for rapid response:

Small fires are detected using infrared and multispectral satellite sensors.

Firefighters and services instantly become aware of new fires and can respond quickly.

It saves lives and property while making a difference to the environment.

Fast action also:

Reduces the threat to people and property, especially in populated areas.

Minimizes environmental impact by reducing emissions and preserving ecosystems.

Saves money and resources, preventing large economic losses.

So, satellites help detect fires quickly and efficiently, which contributes to safety, the environment and saving resources.

Space satellites photograph the Earth from orbit using various sensors and cameras. Imagery includes spectral ranges such as visible light and infrared, providing a variety of data.

Computer vision algorithms process images to identify objects, including wildfires, using infrared data to detect heat sources.

The received data is transmitted to Earth through communication systems and analyzed by specialists to monitor the environment, make operational decisions and ensure safety, including fire fighting.

Future plans for the "Forest Fire Monitoring from Space" project include the following steps:

Expansion of the Satellite Network:

There is a plan for further expanding the satellite network to cover extensive forested areas worldwide. This will enhance the coverage and timeliness of forest fire detection.

Utilizing various types of satellites with different sensors (optical, infrared, radar, etc.) will bolster observation and fire detection capabilities.

Improvement of Data Analysis Algorithms:

The project will focus on continually enhancing data analysis algorithms for more precise and rapid monitoring.

We thank you for your attention to our documentation on monitoring forest and steppe fires using satellite data and modern technologies. This project represents a significant step towards enhancing societal safety and preserving the environment.

If you have any questions or would like to discuss project details, we are always ready for dialogue and collaboration. Our contact information is as follows:

Contact Information:

Email: [Abyroi\_team@gmail.com](mailto:Abyroi_team@gmail.com)

Project Website:

We invite you to actively engage with our work and look forward to mutually beneficial cooperation for a safer and environmentally sustainable future.

This is the general structure of a presentation about the project "Monitoring forest fires from space."



