Dawanal Rakshak: Forest Fire Management and Prevention System

Project Overview

The "Dawanal Rakshak" system is designed to efficiently manage and combat forest fires using a combination of technology-driven solutions. The system integrates surveillance cameras, water pumps, humidity sensors, and automated notifications to detect and respond to forest fires in their early stages. By using technologies like machine learning and automation, it ensures rapid, efficient, and cost-effective fire management.

Environmental and Economic Impact

The recent uttrakhand wild fires 2024, burned over 2000 hectares of forest among 1000 fires.Forest fires not only result in the destruction of wildlife and natural habitats but also cause significant economic damage. The project aims to reduce these impacts by providing a reliable and quick-response fire management solution. Moreover, none of these solutions have been effectively implemented yet in any forest of the world.

Key Components

- **Custom Cascade Classifier Model:** The system uses a custom-trained cascade classifier to detect even small-scale fires, ensuring early identification before they become uncontrollable.
- **Automated Response:** Upon detecting a fire, the system triggers several automatic actions, including:
  - Activation of water pumps to extinguish the fire, also dispersing water in every direction to reduce chance of the fire spreading.
  - Alarms and security lights to alert nearby personnel and wildlife.
  - Automated notifications sent to relevant authorities for rapid intervention.

Alignment with Sustainable Development Goals (SDGs)

"Dawanal Rakshak" contributes to **SDG 15 (Life on Land)**, by protecting forests and combating desertification, land degradation, and biodiversity loss. The project's fire detection and prevention mechanisms safeguard ecosystems and support sustainable land use.

Benefits:

- **Rapid Response:** Early detection and automatic intervention significantly reduce the spread and impact of forest fires.
- **Cost-Effective:** Automation lowers the costs of manual surveillance. Furthermore, this project uses the pre-installed cameras in the forest installed for animal surveillance.
- **Improved Safety:** The system minimizes risks for both fire management personnel and local wildlife.

Working Model

The project is supported by a fully functional working model that demonstrates the effectiveness of the detection system and the automated response mechanisms.

Conclusion

In summary, "Dawanal Rakshak" is an innovative solution for forest fire management, offering both ecological protection while being cost effective. This fire management solution can be implemented on a large scale as an effective solution for the forest fires.

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