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Forest Fire Prediction Using Machine Learning

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***Abstract*— Fire accidents are among the most frequent forms of mishaps that have a major impact on society. Significant loss of life and property has also occurred as a result of fire accidents. To minimize the loss of life and property in such accidents, an effective detection system is necessary. There are several similar systems in operation, but they are not nearly as efficient as is required. Therefore, we have proposed a new system that is a web application to detect fire. We are utilizing machine learning techniques to make it reliable and effective. The system includes brightness classification in addition to image processing and histogram-based segmentation. They're all made to increase precision while also making**

Keywords: **Machine Learning, KNN, Random Forest and Support Vector Machine**

I. INTRODUCTION

Forests are vital to the human environment, yet one of the largest risks to their preservation is fireTracking targets, spotting events, spotting forest fires, monitoring environments, and monitoring health and medical issues are among the applications for wireless sensor networks. Event detection is one application of data observation in wireless sensor networks. After thorough semantic processing of the sensor data, the user is given only pertinent information. Forest fires, sometimes known as wildfires, have come to the top of the list of disasters that happen most frequently in recent years. Large areas of forest land are being destroyed by these flames. Global warming, which is linked to an increased risk of forest fires, is one of the main factors.

In India, the number of forest fires climbed by 125% between 2016 and 2018. Deforestation brought on by forest fires can have a significant negative impact on human culture. But, the aforementioned procedure won't start until after a wildfire has broken out, and by that time, a few acres of forest will have already been lost. The entire procedure must to be recognized beforehand and should be minimized.

LITERATURE SURVEY

Many techniques and strategies for determining the hearth and/or smoke that are supported by picture segmentation techniques may be found in the scientific literature. We cite a few surveys on this subject, but other papers also contain concepts and methods that are similar to the ones used in the current inquiry, which is situated between 15 and 25.

In order to preserve the biodiversity of the forest, preventative measures against forest fires and methods of forest monitoring are used. Geographic information systems (GIS), a type of contemporary information technology, can enhance strategic and tactical planning and measures targeted at preventing fires. The study presents the use of particular information systems for Serbia's forest fire preventio

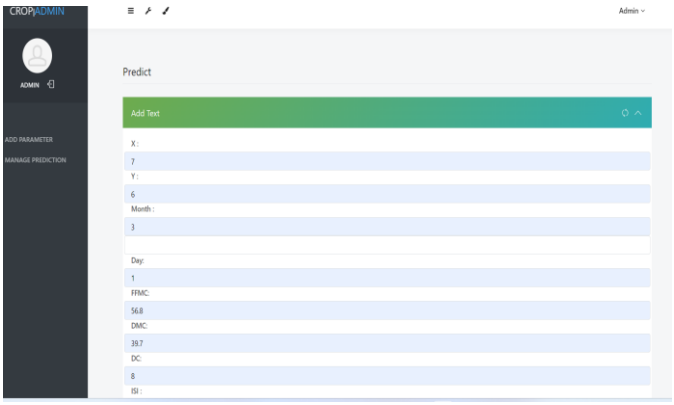
1. K-Nearest Neighbor :- K Nearest Neighbor is a straightforward algorithm that sorts new information or instances based on similarities between them and all previously stored examples. A data point is often categorized using the classification of its neighbors.

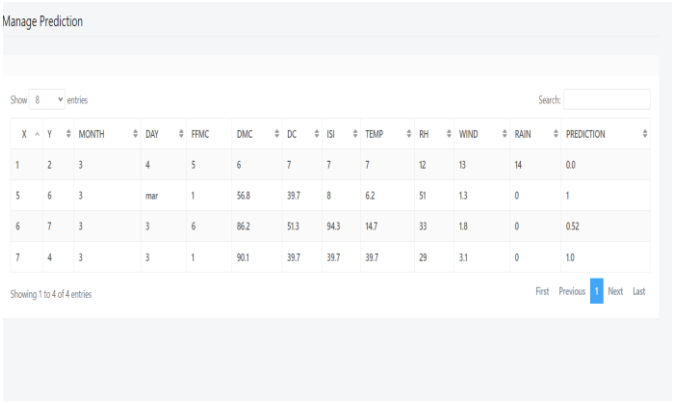
2. Random forest algorithm:- Regression and classification are just two of the many tasks that may be performed with the reliable machine learning algorithm Random Forest. It is an ensemble method, which means that a random forest model is composed of numerous little decision trees, known as estimators, each of which generates a separate set of predictions. The estimators' estimates are combined by the random forest model to yield a more precise prediction.

   Although they perform slightly less well for regression issues, random forests are excellent for classification difficulties. A random forest regressor is unable to generate predictions outside the bounds of its training data, in contrast to linear regression.

3. Support Vector Machine :- SVM is a potent supervised algorithm that excels on complex yet tiny datasets. Although support vector machines, often known as SVM, can be used for classification and regression tasks, they typically perform best in the latter.

OUTPUT





III. .CONCLUSION

For the proposed system, a fire detection technique that makes use of regression and separates the datasets into months has been devised. What makes the method so wonderful is that it can produce a result without using the complete dataset. Future calamities can be included in this plan by extending it. The effectiveness of the model might also be improved by the application of particular transformations.

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