Predict Forest Fire Activity on Multimedia Images Using Data Mining Technique

[1]M. Gomathi, [2]R.Suresh Kumar, [3]S.Kavitha, [4]D.Geetha

[1,3,4]M.Phil Research Scholar, [2]Associate Professor
[1,3,4]Department of Computer Science, [2]Department of B.sc(Computer Science)
Sree Saraswathi Thiyagaraja College, Pollachi, India

***ABSTRACT*- Forest fires are a major environmental issue, creating economical and ecological damage while endangering human lives. Fast detection is a key element for controlling such phenomenon. The appropriate analysis of forest flames is a crucial concern. The development in the amount of woods flares of woodland flame in the latest couple of years has obliged governments to take protections. These Forests flames are a noteworthy issue. On the off chance that the flame contenders know spreading flame and where the flame will be in once in a while it would be simple for them to take precautionary measures against the flame. In this way, for that a noteworthy prerequisite for examination and analysis of the fire of flame exists. The analysis of forest fire behavior is done using multimedia images of forest fire. Finally identify the results of fire detected normal or abnormal stage.**

Keywords- Data mining, Neural Networks, Forest fire, Clustering

I. INTRODUCTION

Data mining has various utilizations in today's general public. Multimedia data mining is the exploration and analysis, by automatic or semi-automatic means, of large quantities of data in order to discover meaningful patterns and rules. Multimedia mining is sub field of the data mining. In multimedia mining there are two types of media like static media and another is dynamic media. Forest fire will consider forest fire data from the natural park, from the Northeast of vedandangal. Satellite-based and infrared/ smoke scanners have high costs. However, weather conditions, such as temperature and air humidity automatic meteorological satiations are often available, and such data can be collected in real-time with low costs.

Forest fires can be characterized in terms of the cause of ignition, their physical properties, the combustible material present, and the effect of weather on the fire. Forest fires can cause damage to property and human life, but they have many beneficial effects on native vegetation, animals, and ecosystems that have evolved with fire. many plant species depend on the effects of fire for growth and reproduction. However, Forest fire in ecosystems where Forest fire is uncommon or where non-native vegetation has encroached may have negative ecological effects. Forest fire behaviour and severity result from the combination of factors such as available fuels, physical setting, and weather.

II. LITERATURE REVIEW

Armando et al. [1] have studied on the automatic recognition of smoke signatures in lidar signals attained from very small-scale experimental forest fires using neural-network algorithms. A scheme of multi-sensorial integrated systems for early detection of forest fires has been presented by **Ollero et al. [2]**. The system presented by the authors uses infrared images, visual images, and data from sensors, maps and models. To facilitate the minimization of perception errors and the improvement in reliability of the detection process, it is necessary for the integration of sensors, territory knowledge and expertise, according to their study.

An improved fire detection algorithm which provides increased sensitivity to smaller, cooler fires as well as a significantly lower false alarm rate has been presented by Louis **Giglio et al. [3].** The Theoretical simulation and high-resolution Advanced Space borne Thermal Emission and Reflection Radiometer (ASTER) scenes are employed to establish the performance of their algorithm. Seng Chuan **Tay et al. [4]** have presented an approach to reduce the false alarms in the hotspots of forest fire regions which uses geographical coordinates of hot spots in forest fire regions for detection of likely fire points. The authors employ clustering and Hough transformation to determine regular patterns in the derived hotspots and classify them as false alarms on the assumption that fires generally do not spread in regular patterns such as straight lines. In this work demonstrate the application of spatial data mining for the reduction of false alarm from the set of hot spots is derived from multimedia images.

III. Existing System

Forest fires are a major environmental issue, creating economical and ecological damage while endangering human lives. Fast detection is a key element for controlling such phenomenon. To achieve this, one alternative is to use automatic tools based on local sensors, such as provided by meteorological stations. In effect, meteorological conditions (e.g. temperature, wind) are known to influence forest fires and several fire indexes, such as the forest Fire Weather Index (FWI), use such data. In this work, we explore a Data Mining (DM) approach to predict the burned area of forest fires. Five different DM techniques, e.g. Support Vector Machines (SVM) and Random Forests, and four distinct feature selection setups (using spatial, temporal, FWI components and weather attributes), were tested on recent real-world data collected from the northeast region of Portugal. The best configuration uses a SVM and four meteorological inputs (i.e. temperature, relative humidity, rain and wind) and it is capable of predicting the burned area of small fires, which are more frequent. Such knowledge is particularly useful for improving firefighting resource management (e.g. prioritizing targets for air tankers and ground crews).

IV.Proposed Methodology

RGB color model are based on lighting condition of R,G,B – so that it may happen that it cause non flame pixels to be considered as flame pixels. And the existing method converts the color image into gray scale image. But Color image is important. Using the histogram for increase the contrasts of forest fire image for apply clustering. Through color image one can identify object & extract from scene easily. Converting to gray scale can best results. Finally produce the results of fire detected normal or abnormal stage.

STEPS INVOLVED IN PROPOSED METHOD:

Step 1: First of all select the input image. Here multimedia image is used.

Step 2: After selecting the image select histogram value for increase the contrast of multimedia images

Step 3: If fire is present then convert image into gray scale.

Step 4: Then find out fire is there or not.

Step 5: After find fire area on the image.

Step 6: Finally produce the results of fire detected normal or abnormal stage.

V.CONCLUSION AND FUTURE SCOPE

The present research is based on hierarchical clustering on thermal images of forest fires where the accuracy achieved is 92.18%. In future, analysis of forest fire can also be done by using another color models like and other clustering algorithms. Some new meteorological variables like temperature, relative humidity, wind speed, rainfall, topology factors like types of forest and location can also be used for evaluation.In further work we would like to use some feature selection algorithms and try to extract the relevant features and try to further improve the accuracy of the models and provide the hint messages for safe the forest.

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