LITERATURE SURVEY FOR FOREST FIRE DETECTION

Abstract:

The importance of forest environment in the perspective of the biodiversity as well as from the economic resources which forests enclose is more than evident. Any threat posed to this critical component of the environment should be identified and attacked through the use of the most efficient available technological means. Early warning and immediate response to a fire event are critical in avoiding great environmental damages. Fire risk assessment, reliable detection and localization of fire as well as motion planning, constitute the most vital ingredients of a fire protection system. Through our prior knowledge Supervised and unsupervised learning, Regression Classification and Clustering Artificial Neural Networks and Convolution Neural Networks our team has an overall idea about Emerging Methods for Early Detection of Forest Fires. The first task is to collect the data because in Convolution Neural Networks, as it deals with images, we need training and testing data sets. After that we pre-process the image and train our deep-learning model. The next step is video analysis to get the prediction for the input frames then we train our Image classification Models on IBM Cloud using IBM Watson Studio Service.

Key words: environment, biodiversity, Detection, Supervised, Unsupervised, deep-learning model, Clustering Artificial Neural Networks, in Convolution Neural Networks, IBM Watson Studio.

I INTRODUCTION

Impact of environment is based by five elements those are land, water, air, sky and fire. Natural disasters are caused by all of these. Earthquake through land and, Tsunami through water, Cyclone through wind, heavy rains are caused by sky and forest destruction is caused by fire. It is up to us as humans to correct the destruction caused by nature. Detection and prevention is more important than thinking about fixing after the event. So, e, we have come together as an engineering team to propose and develop a prototype solution to these issues using our acquired technical knowledge as senior electrical engineering students for our senior design project this semester. Our project idea entitled, “Forrest Fire Detection System,” will be comprised of multiple systems working in tandem: a LoRa antennae system that will wirelessly transmit sensor data to an accessible website, a solar PV power supply, and a data retrieval gateway and alert system. In summary, we aim to reduce the social, economical, and environmental impacts brought on by forest fires.

LITERATURE REVIEW

Image processing is processing of images using mathematical operations by using any form of signal processing for which the input is an image, such as a photograph or video frame the output of image

processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two dimensional signal and applying standard signal processing techniques to it. A colour model is an abstract mathematical model describing the way colours can be represented as tuples of numbers (e.g. triples in RGB or quadruples in CMYK). 1. CMYK Colour Model, 2. RGB Colour Model, 3. YCbCr Colour Model

RESEARCH PAPERS RELATED TO FOREST-FIRE DETECTION

Infrared image processing and its application to forest fire surveillance:

This paper describes a scheme for automatic forest surveillance. A complete system for forest fire detection is firstly presented although we focus on infrared image processing. The proposed scheme based on infrared image processing performs early detection of any fire threat. With the aim of determining the presence or absence of fire, the proposed algorithms performs the fusion of different detectors which exploit different expected characteristics of a real fire, like persistence and increase. Theoretical results and practical simulations are presented to corroborate the control of the system related with probability of false alarm (PFA). Probability of detection (PD) dependence on signal to noise ration (SNR) is also evaluated.

The Identification of Forest Fire Based On Digital Image Processing

In the light of the problem of monitoring forest fire, the design strategy and practical implementation of establishing the fire monitoring system based on digital image information are proposed. The system is based of the continuous image sampling provided by CCD camera. We can obtain the configuration characteristics, dynamic characteristics and color information of interesting region with an application of the digital image processing algorithm, and then to identify the fire source according to the acquired characteristics. The experimental results show that the system can accurately identify and confirm the fire. Besides, the amount of data processed can be reduced because of the use of sampling algorithm thus shortening the execution time.

UAV-based Forest Fire Detection and Tracking Using Image Processing Techniques

In this paper, an unmanned aerial vehicle (UAV) based forest fire detection and tracking method is proposed. Firstly, a brief illustration of UAV-based forest fire detection and tracking system is presented. Then, a set of forest fire detection and t threshold segmentation, morphological operations, and blob counter. The basic idea of the proposed method is to adopt the channel “a” in Lab color model to extract fire-pixels by making use of chromatic features of fire. Numerous experimental validations are carried out, and the experimental results show that the proposed methodology can effectively extract the fire pixels and track the fire zone; racking algorithms are developed including median filtering, color space conversion, Otsu

EXISTING WORK

Existing work contain 1. SENSORS, 2. COMPUTER VISION BASED SYSTEMS, 3. CCD CAMERAS.

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