ISSN NO:[illegible]

COMPREHENSIVE APPROACH FOR FOREST FIRE DETECTION USING WAVELET TRANSFORM

Ms. T. Leela Priyadarsini[1]

R. Sujith Kumar[2], S. K. Karthick Babu[2], K. Karthick[2]

[1]Assistant Professor, Department of ECE, SSM Institute of Engineering and Technology, Dindigul, Tamil Nadu - 624002

[2]Department of ECE, SSM Institute of Engineering and Technology, Dindigul, Tamil Nadu - 624002

Email: leelapremi@gmail.com, sujith7sk@gmail.com, karthickfarmss@gmial.com, skkarthickbabu@gmail.com

Abstract -Since ancient times humans have known fire. We had feared it, welcomed it and now fire is an important parameter which is used in both domestic and industrial applications. Though fire is an unavoidable factor but if it is not handled with proper safety precautions it causes damage to both human life and property. But today fire accidents become very common which is responsible for loss of many valuable resources, human lives and loss of property. So it is necessary to detect and estimate the fire before its occurrence to save the lives of living organisms. Much recent technological advancement had lead to the detection of fire but MATLAB provides an efficient method to detect and estimate fire. Many algorithms were developed to detect and estimate fire some of the notable algorithms are edge detection, boundary detection, Fast Fourier Transform, etc. Though these algorithms can detect fire, the efficiency of these systems are comparatively low, so these algorithms must be modified to obtain highly efficient detection of fire. Wavelet transform is an alternative approach which is used to detect the fire effectively, when wavelet transform is used to detect the flames we can able to obtain the accuracy of about 90 percentage which is an efficient approach compared to other methods.

INTRODUCTION

Fire causes a huge loss to human life and property, hence early detection of fire is very important. Fire detection systems are among the most important components in surveillance systems used to monitor buildings and the environment. Fire detectors, smoke detectors and temperature detectors have been widely used to protect property and give warning of fires. Traditional methods like sensor based methods have many disadvantages: they have transmission delay; they are applicable mainly for indoor regions and cannot be used for outdoor regions to monitor a large area. In a sensor-based fire detection System for an outdoor environment, coverage of large areas is impractical due to the necessity of a regular distribution of sensors in close proximity. Thus they can't be operated in open space and large covered areas. Besides, they usually are unable to provide additional information such as the location and size of the fire and degree of burning. Due to rapid developments in digital camera technology and video processing techniques, there is a major trend to replace conventional fire detection methods with computer vision based systems. In general, computer vision-based fire detection systems employ three major stages: fire pixel classification, moving object segmentation, and analysis of the candidate regions. This analysis is usually based on two figures: the shape of the region and the temporal changes of the region. The fire detection performance depends critically on the effectiveness of the fire pixel classifier which generates seed areas that the rest of the system will exercise. The fire pixel classifier is thus required to have a very high detection rate and preferably, a low false alarm rate. There exist few algorithms which directly deal with the fire pixel classification in the literature. While vision based fire detection has many advantages: a large area can be monitored, the cost of equipment is very low because nowadays closed television systems are already installed in many public places for surveillance purposes. The response