

# **IMAGE PROCESSING BASED FIRE SMOKE DETECTION**



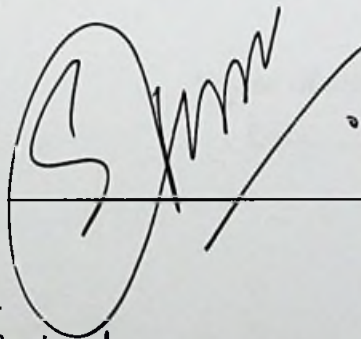
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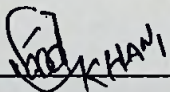
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## ABSTRACT

Early and reliable fire detection has a major role in the prevention of severe human and economic consequences of the fire. This thesis suggests a method for the reliable detection of fire smoke in video sequences recorded by the Internet Protocol (IP) cameras. The proposed method employs in the Discrete Lopez Moreno Transform (DLMT) domain to lower the computations involved in the entire decoding process of the algorithms operating in the spatial domain.

The introduction of the Discrete Lopez Moreno Transform (DLMT) widely increases the reliability and accuracy of the proposed fire smoke detection scheme. DLMT is a new compression scheme that can be applied to the whole image and also its results are independent of the image being processed.

In this work, firstly the fire smoke region is approximated with the motion and color features of the fire smoke. Then noise and isolated regions are eliminated using morphological operations, and eventually, the connected component labeling technique is used to analyze the fire smoke growth through time.

The evaluation results illustrate the efficiency of the proposed work with a false positive and missed detection rates of roughly 2.5%.

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