

Computer vision based forest fire detection and monitoring system

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Abstract

Manned lookout posts are commonly installed in the forests all around the world. Most of these posts have electricity. Surveillance cameras can be placed on to these surveillance towers to monitor the scene for possible forest fires and they can be used to monitor the progress of the fire from remote centers. In this project, a system capable of producing automatic fire alarms will be developed. It will be also possible to approximately determine the location of the fire and monitor the forest fires using wireless communications systems. Currently, average fire detection time is 5 minutes in manned lookout towers. Guards have to work 24 hours in remote locations under difficult circumstances. They may get tired or leave the lookout tower for various reasons. The aim of the proposed system is to reduce the average fire detection rate and reduce the number of guards. Automatic video based fire alarm software is based on the wavelet analysis and hidden Markov modeling of the smoke motion. Changes in video due to sunrise, sunset, clouds and fog will be modeled using hidden Markov models as well. This approach will reduce false alarms due to natural events.

Keywords: forest fire detection, computer vision, wavelet analysis, hidden Markov models, wireless video transmission

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