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Abstract
This paper presents a digital video recorder (DVR) system with real-time motion detection, tracking, and fire detection. An adaptive thresholding method is used to detect a moving object in almost all lighting conditions and the prompt motion can be eliminated to avoid false alarms by limiting the size of the moving object. The adaptive thresholding mechanism is utilized to solve the misjudgment problem caused by the various lighting conditions since a single threshold can not determine whether it is a lighting change or the motion of an object. To cope with the problem of computation, a rectangle-based discrete step motion where a camera’s view frame is divided into many rectangle areas, is used to perform the tracking procedure, the center of the bounding box of moving object is calculated to locate the position of this moving object and the largest bounding box is selected as the major candidate for motion tracking. The system will activate the PTZ camera to track moving object depending on the size of the largest object, as soon as some moving objects are detected. With a lower computation complexity, a RGB-based fire detection is adopted for fire-pixel checking. The experimental results show that the fire flame can be almost completely extracted from various types of nature fire. If the number of extracted fire pixels is greater than the threshold value during a time interval, a fire alarm will be activated.
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