Moving Object Detection and Shadow Elimination in a Dark Indoor Environment with Fixed Weak Lamplight

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ABSTRACT

At present, the application of environment monitoring using video capturing and recording devices become popular day by day. Most of these equipments are installed in communities, shops, or building doorways. Besides, video recorders are also seen in several indoor environments such as train stations and banks. Several secret or private rooms need more accurate monitoring devices than those public spaces. The general monitoring device provides an investigation function after the event. Several intelligent video surveillance systems are developed to contribute a video analysis technique based on computer vision techniques. These surveillance systems are usually available in a bright environment or during the day. However, the accuracy of foreground object detection and shadow elimination is unsatisfactory during the night. In this study, we develop an intelligent video surveillance system using popular web cameras in a dark indoor environment with common fixed weak lamplights. A background model is first trained using a series of video frames and adopted to detect foreground pixels by a background subtracting method. These foreground pixels are then assembled as a foreground object. Those broken or separated objects are patched or merged. Finally, the shadow of foreground objects are then eliminated by analyzing the lamplight color and the relative position between the light source and foreground objects. The satisfactory foreground object detection results verify the feasibility of our proposed method.

Keywords : fixed weak lamplight, background model, foreground object detection, shadow elimination.

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