

REMOVAL OF RAIN STREAKS FROM THE VIDEO

Abstract

Video is the visual part of a movie or recorded program, or something recorded to watch in the future. But different weather conditions such as rain, snow, haze, or fog will cause complex visual effects of spatial or temporal domains in images or videos. Such effects may significantly degrade the performances of outdoor vision systems relying on image/video feature extraction or visual attention modeling, such as image registration, event detection, object detection, tracking, and recognition, scene analysis and classification, image indexing and retrieval, and image copy/near-duplicate detection. A comprehensive survey of detection approaches for outdoor environmental factors such as rain and snow to enhance the accuracy of video-based automatic incident detection systems can be found.

Removal of rain streaks has recently received much attention. To the best of our knowledge, current approaches are all based on detecting and removing rain streaks in a video. This paper is to specifically address the problem of removing rain streaks in a single image. Note that rain removal in an image may also fall into the category of the problem about image noise removal or image restoration. Hence, in the following subsections, we first briefly review current vision-based (video-based) rain removal approaches and image noise removal, followed by presenting our motivations of single-image-based rain streak removal and contribution of the proposed method using patch & dictionary.

The proposed system used patch dictionary process to display an image or video without rain effects. Filter and Component Analyzer is used to separate and remove the rain streaks from an image or video. An initial rain map from an image frame, which is then, refined based on sparse representation and classification. Finally, we reconstruct a rain-free frame by exploiting the information in adjacent frames. Patch Dictionary method and Morphological Component Analysis (MCA) is used for image denoising.