



A Fast Model-Free Morphology-Based Object Tracking Algorithm

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Abstract

This paper describes the multiple object tracking component of an automated CCTV surveillance system. The system tracks objects, and alerts the operator if unusual trajectories are discovered. Objects are detected by background differencing. Low contrast levels can present problems, leading to poor object segmentation and fragmentation, particularly on older analogue surveillance networks. The model-free tracking algorithm described in this paper addresses object fragmentation, and the object merging that occurs when proximate objects segment to the same connected component.

1 Introduction

Automated visual surveillance aims to provide an attention-focussing filter to enable an operator to make an optimum decision whenever an unusual event occurs [1]. This is achieved by directing the operator's attention only to those events classified as unusual. The backbone of such systems typically comprises something like the processing pipeline shown in figure 1.

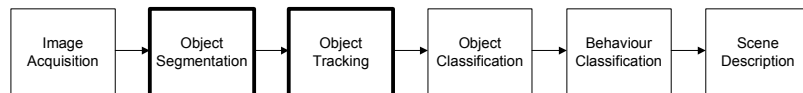


Figure 1: Typical image processing pipeline for automated video surveillance

The blocks outlined in bold are dealt with in this paper, focussing on the object tracking module, which must deal with the uncertainty of object segmentation. This uncertainty is manifest when moving objects are segmented by background differencing, where it is common for the segmented object to fragment due to parts of the object matching the greyscale of the background. This problem is exacerbated when CCTV system managers wish to implement modern automated surveillance techniques

