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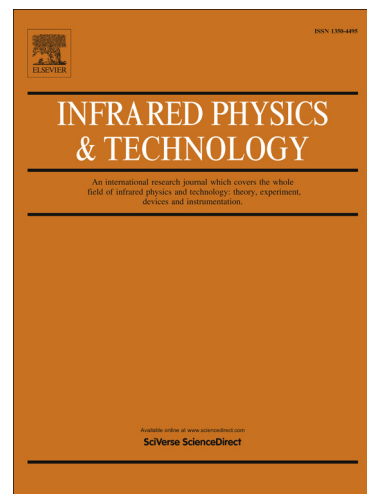
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The moving target detection algorithm based on the improved visual background extraction

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ABSTRACT

This paper presents a moving target detection algorithm based on the improved visual background extraction. Traditional VIBE (Visual Background Extractor) algorithm is one of the powerful background subtraction algorithm. It can quickly, accurately and integrally detect moving target. However, some times it will falsely determine background as foreground and impact detection results. In this paper, we improve the traditional VIBE algorithm by joining TOM (Time of map) mechanism in the process of detection, so it can not only use the pixel's spatial domain information, but also make full use of the pixel's time domain information. Experiments detailed in this paper show the algorithm presented in this paper has better detection effect than the traditional VIBE algorithm.

Key Words: Moving target detection; VIBE; Ghosting Elimination

1. INTRODUCTION

In the field of computer vision, people put more and more attention on the moving target detection. It extracts the moving target by analyzing the video sequence images and it is the foundation of other subsequent processing, such as moving target tracking[1]. In the civil field, the moving object detection is an important part of intelligent video surveillance system, which restricts the stability and reliability of the intelligent video surveillance system. In the military field, infrared target detection is one of the hot topics in the research of precision-guided weapon. It is also an important part of the automatic target recognition system(ATR)[2], to improve the role of distance and probability of detection system plays an important role.

Traditional VIBE (Visual Background Extractor) algorithm is one of the background subtraction algorithms based on the background extraction with spatiotemporal random selection by Olivier Barnich and MarcVan Droogenbroeck[3]. Unlike some background modeling algorithms (kernel density estimation [4], Gaussian mixture background modeling [5]) which use the estimated probability density function of pixels to establish background model, VIBE uses a series of pixels as a set for each pixel to establish the background model, and random selection mechanism is introduced into the background modeling for the first time. Estimating the background model by randomly selecting sample can describe the stochastic volatility of the actual scene. VIBE is simple, efficient and easy to implement.

But traditional VIBE algorithm will determine background as foreground and not update the background model when the initial frame of video exists moving target or the moving target remains a long period of static state or even motionless permanently. The false target(ghosting) will be appeared in later detection in such case.

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