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# A novel visual saliency detection method for infrared video sequences

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**Abstract:** Infrared video applications such as target detection and recognition, moving target tracking, and so forth can benefit a lot from visual saliency detection, which is essentially a method to automatically localize the “important” content in videos. In this paper, a novel visual saliency detection method for infrared video sequences is proposed. Specifically, for infrared video saliency detection, both the spatial saliency and temporal saliency are considered. For spatial saliency, we adopt a mutual consistency-guided spatial cues combination-based method to capture the regions with obvious luminance contrast and contour features. For temporal saliency, a multi-frame symmetric difference approach is proposed to discriminate salient moving regions of interest from background motions. Then, the spatial saliency and temporal saliency are combined to compute the spatiotemporal saliency using an adaptive fusion strategy. Besides, to highlight the spatiotemporal salient regions uniformly, a multi-scale fusion approach is embedded into the spatiotemporal saliency model. Finally, a Gestalt theory-inspired optimization algorithm is designed to further improve the reliability of the final saliency map. Experimental results demonstrate that our method outperforms many state-of-the-art saliency detection approaches for infrared videos under various backgrounds.

**Keywords:** infrared video; saliency detection; spatial saliency; temporal saliency; Gestalt.

## 1. Introduction

Visual attention (saliency) is an important mechanism in human vision system (HVS): Although humans capture abundant visual information when their eyes gaze at a natural scene, the limited perceptual resources are only allocated for the scene regions that matter the most [1]. Due to the remarkable properties of visual attention, it has gained widespread interest in the fields of psychology, cognitive neuroscience, as well as computer science. In the computer vision society, researches have made a good effort to design various computational models to simulate visual saliency

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