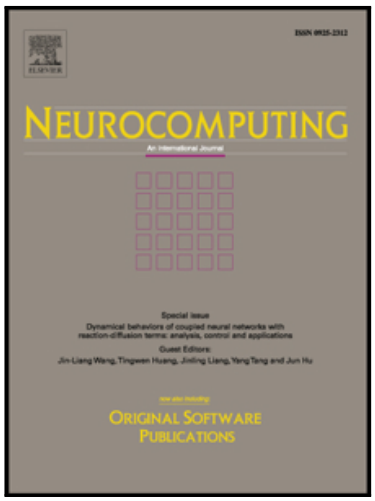

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SIFT flow for abrupt motion tracking via adaptive samples selection with sparse representation

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Abstract

Abrupt motions commonly cause conventional tracking methods to fail because they violate the motion smoothness constraint. To overcome this problem,we propose a novel SIFT flow tracker (SFT) and integrate it into a sparse representation-based tracking framework.In this method, we firstly introduce SIFT flow method to address the tracking problem. The method can avoid the local-trap modes and cope with abrupt motion without any prior knowledge. Then, for obtaining the effective samples, we design a new hybrid sampling mechanism,which can sample the local and global predicted location according to confidence map .Firnally, to adapt the target appearance variations,especially to partial occlusion, we embed SFT to L1 tracker and construct a unified framework to track both smooth and abrupt motion in time. Compared with several state-of-art tracking algorithms, experimental results demonstrate that our method achieves favorable performance in handling abrupt motion, even under target appearance variations including illumination changes, partial occlusion and pose changes.

Keywords: Visual tracking; Abrupt motion; SIFT flow tracking; Belief propagation ; Sparse representation

1. Introduction

In recent years, visual tracking has received a great deal of attention in computer vision duo to its success in many real-world applications such as visual surveillance, human computer interaction, and medical imaging. Although

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