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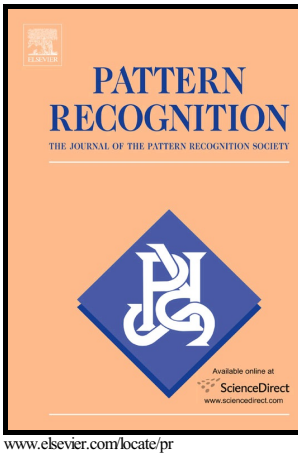

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PII: S0031-3203(15)00316-7
DOI: http://dx.doi.org/10.1016/j.patcog.2015.09.002
Reference: PR5505

To appear in: *Pattern Recognition*

Received date: 3 January 2015
Revised date: 30 June 2015
Accepted date: 1 September 2015

Cite this article as: Zhigang Tu, Ronald Poppe and Remco C. Veltkamp, Weighted Local Intensity Fusion Method for Variational Optical Flow Estimation, *Pattern Recognition,* http://dx.doi.org/10.1016/j.patcog.2015.09.002

Weighted Local Intensity Fusion Method for Variational Optical Flow Estimation

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Abstract

Estimating a dense motion field of successive video frames is a fundamental problem in image processing. The multi-scale variational optical flow method is a critical technique that addresses this issue. Despite the considerable progress over the past decades, there are still some challenges such as dealing with large displacements and estimating the smoothness parameter. We present a local intensity fusion (LIF) method to tackle these difficulties. By evaluating the local interpolation error in terms of L1 block match on the corresponding set of images, we fuse flow proposals which are obtained from different methods and from different parameter settings integrally under a unified LIF. This approach has two benefits: (1) the incorporated matching information is helpful to recover large displacements; and (2) the obtained optimal fusion solution gives a tradeoff between the data term and the smoothness term. In addition, a selective gradient based weight is introduced to improve the performance of the LIF. Finally, we propose a corrected weighted median filter (CWMF), which applies the motion information to correct errors of the color distance weight to denoise the intermediate flow fields during optimization. Experiments demonstrate the effectiveness of our method.

Keywords: optical flow, weighted local intensity fusion, large displacement,

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[1]This publication was supported by the Dutch national program COMMIT.