CARPATHIAN J. MATH. 29 (2013), No. 1, 109 - 117
Online version available at http://carpathian.ubm.ro
Print Edition: ISSN 1584 - 2851 Online Edition: ISSN 1843 - 4401

Optimization methods for l^1-energy minimization in the estimation of optical flow

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ABSTRACT.

The aim of this paper is to present a new approach for solving the minimization problem for a large class of energy functionals that appear in the differential models of optical flow estimation problems, and which are expressed using the discrete l^1-norm. The choice of l^1-energy minimization is motivated by the fact that quadratic l^2 optimization is not robust to outliers and that l^1-norm is a better choice for modeling real problems involving discrete signals.
The method described in this paper is very general, thus the advantage of being applicable to almost every differential model that has been proposed so far for the optical flow estimation problem. In order to test and validate our method, a MATLAB implementation on several optical flow models is currently under development. Also, a multi-core implementation on GP-GPU is to be considered in the near future.

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Received: 30.10.2011; In revised form: 27.08.2012; Accepted: 15.10.2012
2010 *Mathematics Subject Classification*. 68U10, 90C90, 65K05.
Key words and phrases. *Image motion analysis, mathematical programming, Matlab, minimization methods, multi-core processing.*