In this paper, a new hybrid local-global stereo matching algorithm (BFGc) is proposed. BFGc makes the maximum benefit from both the introduced local and the global approaches representing the main two stage of the algorithm. Globally, a new energy formulation of the stereo problem in segment domain is proposed which basically depends on the reliability of the disparity estimates results from the adopted local approach, unlike what is typical in global methods. For increasing reliability of the local approach, a new gradient masks is supporting the adopted similarity measure and Bilateral filter, with its edge preserving sense, is adopted for more proper disparity assignment. In segment domain, a plan fitting technique is introduced which aims at inferring all valid planes in disparity space and producing a good initialization for the global optimization space which aims at assigning memberships to the these planes to all pixels in the reference image. The experimental results on the Middlebury dataset demonstrate that our approach stands as a strong candidate with the modern stereo matching algorithms.
New Global Formulation for a Bilateral based Stereo Matching Algorithm

- Gerrits, M. and Bekaert, P. 2006. Local stereo matching with segmentation-based

- Zuliani, M. RANSAC for Dummies, Vision Research Lab, University of California, Santa Barbara (2009).

Index Terms

Computer Science
Algorithms

Keywords
Stereo matching  Self-adapting similarity measure  Color segmentation  Graph cuts