Abstract

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.
- Gerrits, M. and Bekaert, P. 2006. Local stereo matching with segmentation-based
aggregation strategy for stereo correspondence based on approximated joint bilateral filtering.
Berlin Heidelberg.
- Birchfield, S. and Tomasi, C. 1999. Multiway cut for stereo and motion with slanted
- Bleyer, M. and Gelautz, M. 2006. Graph-based surface reconstruction from stereo
- Zuliani, M. RANSAC for Dummies, Vision Research Lab, University of California, Santa
Barbara (2009).
middlebury.edu/stereo/eval.
- Pham, C. C., Ha, S. V. U., and Jeon, J. W. 2012. Adaptive guided image filtering for
sharpness enhancement and noise reduction. In Advances in Image and Video Technology ,
323-334. Springer Berlin Heidelberg.

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