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Authors
Wills, Josh
Belongie, Serge

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A Feature-based Approach for Determining
Dense Long Range Correspondences

Josh Wills and Serge Belongie

University of California, San Diego

La Jolla, CA 92093 USA

email{josh,sjb}@cs.ucsd.edu

Abstract. Planar motion models can provide gross motion estimation and good segmentation for image pairs with large inter-frame disparity. However, as the disparity becomes larger, the resulting dense correspondences will become increasingly inaccurate for everything but purely planar objects. Flexible motion models, on the other hand, tend to overfit and thus make partitioning difficult. For this reason, to achieve dense optical flow for image sequences with large inter-frame disparity, we propose a two stage process in which a planar model is used to get an approximation for the segmentation and the gross motion, and then a spline is used to refine the fit. We present experimental results for dense optical flow estimation on image pairs with large inter-frame disparity that are beyond the scope of existing approaches.

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