How to improve local optima of optical flow energies using discrete matches

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In this talk we introduce a large displacement optical flow method that introduces a new strategy to compute a good local minimum of any optical flow energy functional. The method requires a given set of discrete matches, which can be extremely sparse, and an energy functional which locally guides the interpolation from those matches. In particular, the matches are used to guide a structured coordinate-descent of the energy functional around these keypoints. It results in a two-step minimization method at the finest scale which is very robust to the inevitable outliers of the sparse matcher and able to capture large displacements of small objects. Its benefits over other variational methods that also rely on a set of sparse matches are its robustness against very few matches, high levels of noise and outliers. We validate our proposal using several optical flow variational models. The results consistently outperform the coarse-to-fine approaches and achieve good qualitative and quantitative performance on the standard optical flow benchmarks. It will based, essentially, on previous works of the author and his collaborators (see, for instance [1] and references therein).

References

[1] P.Palomares, R., Meinhdardt-Llopis, E., Ballester, C., Haro, G. How to improve local optima of optical flow energies using discrete matches *ArXiv e-prints*, 2016