Power Watersheds and Contrast Invariance

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Abstract

This survey reviews the existing applications of the power watershed (PW) optimization framework in the context of image processing. In literature, it is known that PW framework when applied to some well-known variational and/or graph-based image segmentation and filtering algorithms such as random walker, isoperimetric partitioning, ratio-cut clustering, multi-cut and shortest path filters yield faster yet consistent solutions. In this talk, the intuition behind the working of PW framework i.e. exploitation of contrast invariance on image data is explained. The intuitions are illustrated with fictitious images and experiments. The ideas from the framework can be adapted to a large class of graph-based cost minimization methods, and can be combined with deep learning networks, leading to scalable algorithms that attain high quality image segmentation and filtering results.

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