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Abstract

We present a novel image superpixel segmentation approach using the proposed lazy random walk (LRW) algorithm in this paper. Our method begins with initializing the seed positions and runs the LRW algorithm on the input image to obtain the probabilities of each pixel. Then, the boundaries of initial superpixels are obtained according to the probabilities and the commute time. The initial superpixels are iteratively optimized by the new energy function, which is defined on the commute time and the texture measurement.

Refer
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- F. R. K. Chung, Spectral Graph Theory. Providence, RI, USA: Amer. Math. Soc. , 1997.
- D. Martin, C. Fowlkes, D. Tal, and J. Malik, "A database of human segmented natural images and its application to evaluating segmentation algorithms and measuring ecological statistics," in Proc. 8th IEEE ICCV, Vancouver, BC, Canada, Jul. 2001, pp. 416-423.
- D. Aldous and J. Fill. (2002). Reversible Markov Chains and Random Walks on Graphs [Online]. Available:<http://statwww.berkeley.edu/users/aldous/RWG/book.html>
- A. Y. Ng, M. I. Jordan, and Y. Weiss, "On spectral clustering: Analysis and an algorithm," in Proc. NIPS, 2002, pp. 849-856.
- D. Comaniciu and P. Meer, "Mean shift: A robust approach toward feature space analysis," IEEE Trans. Pattern Anal. Mach. Intell. , vol. 24, no. 5, pp. 603-619, May 2002.
- T. Ojala, M. Pietikäinen, and T. Mäenpää, "Multiresolution gray scale and rotation invariant texture analysis with local binary patterns," IEEE Trans. Pattern Anal. Mach. Intell. , vol. 24, no. 7, pp. 971-987, Jul. 2002.
- X. Ren and J. Malik, "Learning a classification model for segmentation," in Proc. 9th IEEE ICCV, Oct. 2003, pp. 10-17
- J. Ham, D. D. Lee, S. Mika, and B. Schölkopf, "A kernel view of the dimensionality reduction of manifolds," in Proc. 21st ICML, 2004, pp. 1-9.
- D. Zhou and B. Schölkopf, "Learning from labeled and unlabeled data using random walks," in Proc. DAGM, 2004, pp. 237-244.
- G. Mori, X. Ren, A. A. Efros, and J. Malik, "Recovering human body configurations: Combining segmentation and recognition," in Proc. IEEE CVPR, Jul. 2004, pp. 326-333.
- P. Felzenszwalb and D. Huttenlocher, "Efficient graph-based image segmentation," Int. J. Comput. Vis. , vol. 59, no. 2, pp. 167-181, 2004.
- L. Grady, "Random walks for image segmentation," IEEE Trans. Pattern Anal. Mach. Intell. , vol. 28, no. 11, pp. 1768-1783, Nov. 2006.
- L. Grady and E. Schwartz, "Isoperimetric graph partitioning for image segmentation," IEEE Trans. Pattern Anal. Mach. Intell. , vol. 28, no. 3, pp. 469-475, Mar. 2006.
- A. K. Sinop and L. Grady, "A seeded image segmentation framework unifying graph cuts and random walks which yields a new algorithm," in Proc. IEEE ICCV, Oct. 2007, pp. 1-8.
- X. Bai and G. Sapiro, "A geodesic framework for fast interactive image and video segmentation and matting," in Proc. IEEE 11th ICCV, Oct. 2007, pp. 1-8.
- A. Moore, S. Prince, J. Warrell, U. Mohammed, and G. Jones, "Superpixel lattices," in Proc. IEEE CVPR, Jun. 2008, pp. 1-8.
- A. Levinstein, A. Stere, K. Kutulakos, D. Fleet, S. Dickinson, and K. Siddiqi, "Turbopixels: Fast superpixels using geometric flows," IEEE Trans. Pattern Anal. Mach. Intell. , vol. 31, no. 12, pp. 2290-2297, Dec. 2009.
- D. S. Watkins, Fundamentals of Matrix Computations, 3rd ed. New York, NY, USA: Wiley, 2010.
- O. Veksler, Y. Boykov, and P. Mehrani, "Superpixels and supervoxels in an

energy optimization framework," in Proc. ECCV, 2010, pp. 211-224.

- A. Moore, S. Prince, and J. Warrel, "Lattice cut—Constructing superpixels using layer constraints," in Proc. IEEE CVPR, Jun. 2010, pp. 2117-2124.

- S. Achanta, A. Shaji, K. Smith, A. Lucchi, P. Fua, and S. Süsstrunk, "SLIC superpixels," EPFL, Lausanne, Switzerland, Tech. Rep. 149300, 2010.

Index Terms

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Keywords

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