Seminar/Talk

Efficient Graph Cut Optimization for Full CRFs with Quantized Edges

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Host: Vladimir Kolmogorov

Fully connected pairwise Conditional Random Fields (Full-CRF) with Gaussian edgeweights can achieve superior results compared to sparsely connected CRFs. However, traditional methods for Full-CRFs are too expensive. Previous work develops efficient approximate optimization based on mean field inference, which is a local optimization method and can be far from the optimum. We propose efficient and effective optimization based on graph cuts for Full-CRFs with \em quantized edge weights. To quantize edge weights, we partition the image into superpixels and assume that the weight of an edge between any two pixels depends only on the superpixels these pixels belong to. Our quantized edge CRF is an approximation to the Gaussian edge CRF, and gets closer to it as superpixel size decreases. Being an approximation, our model offers an intuition about the regularization properties of the Guassian edge Full-CRF. For efficient inference, we first consider the two-label case and develop an approximate method based on transforming the original problem into a smaller domain. Then we handle multi-label CRF by showing how to implement expansion moves.In both binary and multi-label cases, our solutions have significantly lower energy compared to that of mean field inference. We also show the effectiveness of our approach on semantic segmentation task.

Friday, December 15, 2017 09:15am - 09:45am
Mondi Seminar Room 3, Central Building

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