

## **Scene parsing using region-based generative models**

Semantic scene classification is a challenging problem in computer vision. In contrast to the common approach of using low-level features computed from the whole scene, we propose "scene parsing" utilizing semantic object detectors (e.g., sky, foliage, and pavement) and region-based scene-configuration models. Because semantic detectors are faulty in practice, it is critical to develop a region-based generative model of outdoor scenes based on characteristic objects in the scene and spatial relationships between them. Since a fully connected scene configuration model is intractable, we chose to model pairwise relationships between regions and estimate scene probabilities using loopy belief propagation on a factor graph. We demonstrate the promise of this approach on a set of over 2000 outdoor photographs, comparing it with existing discriminative approaches and those using low-level features.