

Title: Sematic Scene Segmentation with Shape-Variant Context

Abstract: Context is essential for semantic segmentation. Due to the diverse shapes of objects and their complex layout in various scene images, the spatial scales and shapes of contexts for different objects have very large variation. It is thus ineffective or inefficient to aggregate various context information from a predefined fixed region. In this speech, I will present a scale- and shape-variant semantic mask for each pixel to confine its contextual region. To this end, a novel paired convolution is proposed to infer the semantic correlation of the pair and based on that to generate a shape mask. Using the inferred spatial scope of the contextual region, a shape-variant convolution is controlled by the shape mask that varies with the appearance of input. In this way, the proposed network aggregates the context information of a pixel from its semantic-correlated region instead of a predefined fixed region. Furthermore, this work also proposes a labeling denoising model to reduce wrong predictions caused by the noisy low-level features. Finally, I will show the state-of-the-art performances achieved by the presented techniques on six public segmentation datasets.