



Matching with Shape Contexts

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Abstract

In this lecture we will discuss an approach to the analysis and matching of shapes. Along with features such as color and texture, shape is essential to the task of visual object recognition.

In our approach, we achieve flexible shape representation by stochastic sampling of contours and by attaching a rich descriptor, the "shape context," to each point. The shape context captures the distribution of shape points relative to the reference point and thus offers a globally discriminative characterization for each shape point. The shape descriptor allows for a highly effective procedure that recovers shape correspondences by employing a weighted bipartite matching procedure. An established point correspondence then allows us to recover the optimal transformation between shapes. Regularized thin-plate splines provide us with a flexible class of transformation maps for this purpose. Finally we will discuss extensions of shape contexts and related approaches that incorporate local features beyond low-level edges.