Meaningful Correspondence, Local Contex and Shape Statistics in Deformable Templates

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Abstract

The paper presents a variational framework to compute first and second order statistics of an ensemble of shapes undergoing deformations. Geometrically "meaningful" correspondence between shapes is established via a kernel descriptor that characterizes local shape properties. Such a descriptor allows retaining geometric features such as high-curvature structures in the average shape, unlike conventional methods where the average shape is usually smoothed out by generic regularization terms. The obtained shape statistics are integrated into segmentation as a prior knowledge. The effectiveness of the method is demonstrated through experimental results with synthetic and real images.