

A CONTINUOUS PARAMETRIC SHAPE MODEL

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Abstract. In this paper we propose a flexible continuous parametric shape model for star-shaped planar objects. The model is based on a polar Fourier expansion of the normalized radius-vector function. The expected phase amplitudes are modelled by a simple regression with parameters having nice geometric interpretations. The suggested *generalized p -order model* is an extension of first- and second-order Gaussian shape models, and in particular the Gaussian assumption is relaxed. The statistical analysis is straightforward, as demonstrated by an application concerning shape discrimination of two cell nuclei populations.

Key words and phrases: Cancer diagnostics, featureless objects, Fourier descriptors, radius-vector function, shape, star-shaped objects.