

# DESCRIPTION OF BIOMEDICAL TEXTURES BY STATISTICAL PROPERTIES OF MORPHOLOGICAL SPECTRA

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## **Abstract**

A class of mathematical models of biological textures based on the multi-variable probability distributions of their morphological spectra is described. It is shown that a large class of such distributions can be presented by sufficient statistics consisting of the coefficients of their expansion into the series of multi-variable Hermite polynomials. The sufficient statistics can then be simplified by rejection of higher-order terms. The general concepts of mathematical models construction are illustrated by examples of textures of several biological tissues (aorta walls, liver and blood). The role of statistics based on absolute values of morphological spectral components and of their cross-correlation coefficients is underlined.

**Keywords:** texture analysis, statistical models, morphological spectra, multivariable Hermite polynomials