DEVELOPMENT OF THE INFORMATION TECHNOLOGY FOR ESTIMATION OF FUNDUS IMAGE GEOMETRIC PARAMETERS

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This work deals with analysis of a class of images containing branches of tree-like structures. We propose a technology for estimating parameters of such structures, which is exemplified by the eye fundus blood vessels. We offer models of tree-like object images, a branch model, and a model of image brightness profile that enable a diagnostic feature set to be generated. Analysis of methods for vessel thickness estimation is conducted. We give a detailed description of the approximation methods for parameter estimation that rely upon the idea of the parametric approximation of brightness profile of an isolated image fragment of the vessel under study. Three different models of brightness profile are proposed for determining the vessel thickness parameter. A local fan transform method is described that enables one to identify the branch directions at arbitrary points of the fundus image. Experimental studies on test and natural images are discussed.

Fundus, vessel thickness, approximation, brightness profile, stepwise-parabolic model

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