

Information System for Early Diabetic Retinopathy Diagnostics Based on Multiscale Texture Gradient Method

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Abstract : Structures of eye bottom were extracted using multiscale texture gradient method and color characteristics of macular zone and vessels were verified in CIELAB scale. The difference of average values of L*, a* and b* coordinates of CIE (International Commission of Illumination) scale in patients with diabetes and healthy volunteers was compared. The average value of L* in diabetic patients exceeded such one in the group of practically healthy persons by 2.71 times ($P < 0.05$), while the value of a* index was reduced by 3.8 times when compared with control one ($P < 0.05$). b* index exceeded such one in the control group by 12.4 times ($P < 0.05$). The integrated index on color difference (ΔE) exceeded control value by 2.87 times ($P < 0.05$). More pronounced differences with ΔE were followed by a shorter period of MA appearance with a correlation level at -0.56 ($P < 0.05$). The specificity of diagnostics raised by 2.17 times ($P < 0.05$) and negative prognostic index exceeded such one determined with the expert method by 2.26 times ($P < 0.05$).

Keywords : diabetic retinopathy, multiscale texture gradient, color spectrum analysis, medical diagnostics

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