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

Authors : L. S. Godlevsky, N. V. Kresyun, V. P. Martsenyuk, K. S. Shakun, T. V. Tatarchuk, K. O. Prybolovets, L. F. Kalinichenko, M. Karpinski, T. Gancarczyk

**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 Commision 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 (<em>P</em> &nbsp;&lt;&nbsp;0.05), while the value of a\* index was reduced by 3.8 times when compared with control one (<em>P</em> &nbsp;&lt;&nbsp;0.05). b\* index exceeded such one in the control group by 12.4 times (<em>P</em> &nbsp;&lt;&nbsp;0.05). The integrated index on color difference (&Delta;<em>E</em>) exceeded control value by 2.87 times (<em>P</em> &nbsp;&lt;&nbsp;0.05). More pronounced differences with &Delta;<em>E</em> were followed by a shorter period of MA appearance with a correlation level at -0.56 (<em>P</em> &nbsp;&lt;&nbsp;0.05). The specificity of diagnostics raised by 2.17 times (<em>P</em> &nbsp;&lt;&nbsp;0.05). The specificity of diagnostics raised by 2.26 times (<em>P</em> &nbsp;&lt;&nbsp;0.05).

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

Conference Title : ICISD 2020 : International Conference on Information Systems Development

Conference Location : London, United Kingdom

Conference Dates : April 23-24, 2020

1