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Optical methods of processing of biomedical image of retinal macular region of the eye

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Abstract

This work develops the processing technology of the tomogram image of retina macular area of the human eye that allows to achieve higher efficiency in contour determination.

Key words: *image processing; retinography; tomography.*

Анотація

В роботі розроблена технологія обробки томографічного зображення макулярної області сітківки ока людини, що дозволяє досягати підвищеної ефективності визначення контурів.

Ключові слова: *обробка зображень; ретинографія; томографія.*

Purpose

The aim of the work is to improve the efficiency of medical diagnosis of the eye, including macular area by creating new technology edge in optical coherence tomograms macular area of the retina of the eye.

Methods

OCT (optical coherent tomography) is the method of ophthalmic studies which allows to receive the image of optically transparent eye tissues with high spatial resolution. To receive the tomograms, there had been used at optical coherent tomography CT STRATUS OCT 3000, which has the following features: diagnostics of pathologies of the bottom of the fundus, the early diagnosis of glaucoma tracking pathology of retina and optic nerve in the dynamics, the fundus picture, optical coherence tomography of the anterior part of the eye.

Results

For the determination of the contour in the tomogram of the retina macular area, there had been carried out a number of transformation on of the above image as follows. Preliminary analysis of the images of cellular structures during histological studies allows to make a conclusion that most of the images in the process of their formation (photography, scanning, etc.), are influenced by a number of negative factors that lead to the appearance of fuzzy and noisy areas. Vertical limits of the output image correspond to the pixels with high modulus values on the final image. Therefore, the different filters are filters which find the edges. The above allows to state that the application of our processing technology to the tomogram of retina macular area of an eye allows to achieve the better efficiency in contour determination.

Conclusion

The results are essential for the determination of the small sized changes in the macular area of an eye retina. It allows the expert to evaluate the degree of the visual acuity as well as to trace the dynamics of the pathological changes, which is especially important in the modern ophthalmology.

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