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SEGMENTATION OF ULTREVIOLET-DERMATOSCOPIC IMAGES

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Based on the UV dermoscopy method, using the SkinScope device, images of the skin of a person's face are examined. The color systems that are used in the evaluation of images in UV dermoscopy are considered. It is proposed to evaluate the UV-dermoscopic images using the method of transition from the RGB system to the HSV system. The basic concepts of UV-dermoscopic image segmentation are being studied. The analysis of segmented images is considered.
Keywords: video dermatoscopy, segmentation, color characteristics, image processing, color systems

Topical. Videodermoscopy is a non-invasive and effective method for diagnosing skin diseases, which enables specialists to detect even the most invisible to the naked eye signs of skin diseases and neoplasms [1].

Therefore, the video dermoscopy method improves the accuracy of diagnosis of skin lesions, including pigmented ones.

UV dermoscopy allows you to expand the possibilities of routine clinical examination. The image obtained using dermoscopy can be saved in the computer's memory. This allows a phased study of nevuses (moles) - pigmented skin formations and dynamic monitoring.

An own study was conducted, which was carried out using the SkinScope. Device, which is used in modern cosmetology [2].

Picture 1 – ScinScope

Skin problems were determined using a correlation table. Below you can see the researched - on the left, the relationship table - on the right.

Picture 2 – Researching image

It has been studied that the skin of the person under study is fully consistent with the norm, with the exception of the oily skin, which is associated with the fact that the drug was applied to the skin of the person the day before the study [9]. You can see that despite the fact that she washed her face, the remnants of the medicine, namely zinc paste, the main components of which are corn starch 25 mg and petrolatum 48 mg, remain on the skin. They can be seen as white spots on the forehead.

It is known that image processing uses color systems such as RGB and HSV color systems. The RGB system is hardware-oriented, while the HSV is tuned for humans [6]. It is known that the latter system allows you to operate with such indicators as hue, brightness and saturation, which is intuitively clear for a specialist to perceive. Therefore, it is advisable to switch from RGB to HSV systems.

RGB is a color model, named after the three capital letters of the names of the colors underlying it: Red, Green, Blue, or red, green, blue. These colors form all the intermediate ones. This is also called the additive model. It is used to display images on screens of monitors and other electronic devices, and has a large color gamut.

HSV system in its turn, which is characterized as:

- Hue - color tone (for example, red, green or blue-blue).
- Saturation - saturation.
- Value or Brightness - brightness.

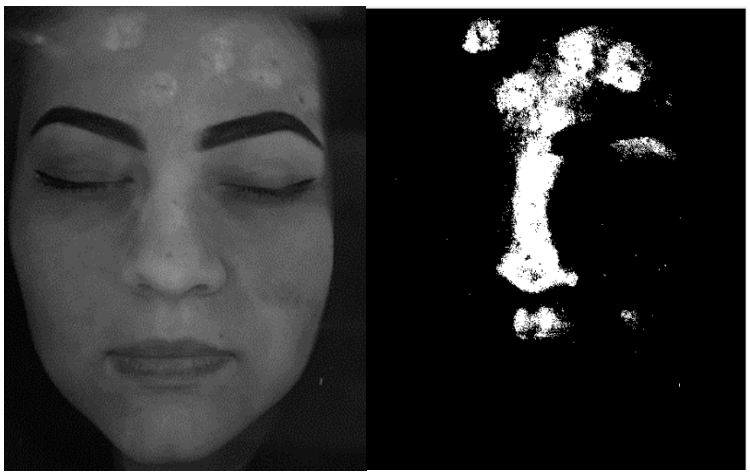
The next step for image processing is the segmentation of images obtained using the ScinScope apparatus.

Segmentation is the process of dividing a digital image into several segments. The purpose of segmentation is to simplify or change the representation of an image so that it is simpler and easier to analyze [3-5].

Image segmentation is commonly used to highlight objects and their borders in images. This leads to the assignment of labels to each image element based on their visual characteristics.

The result of image segmentation is a multitude of objects that together cover the entire image, or a multitude of contours of these objects isolated from the image. All elements of the selected object are similar in some characteristic or calculated property, for example, in color, brightness or texture. Neighboring segments differ significantly in this characteristic [7,8].

By this principle, the image of the subject was segmented. Alternately changing the coordinates of green, blue or red, the areas in the second, segmented image also changed. Areas similar in color and characteristics are shown in white.



Picture 3 – Segmentation

Conclusion. In a method such as UV dermoscopy, an important step is the processing and segmentation of the resulting image in order to make a correct diagnosis for the doctor. In the tasks of automatic processing of UV-dermoscopic data, the perception of the field of view is associated with a priori information about the image under study. When developing methods for processing dermoscopic images, it is advisable to choose methods that facilitate the next stages of data analysis. When choosing color systems for digital image processing, choose the right system that can describe the image in terms of brightness, saturation, or color.

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