ANALYSIS OF IDENTIFICATION AND RECOGNITION OF COLOR IMAGES

Turapov U.U.

(Associate Professor, Department of "Information Systems and Technologies", Tashkent State Agrarian University, Ph.D.)

Melikulova Sh.B., Tillaeva Sh.J., To'rabekov J.J.

(Tashkent State Agrarian University, Department of Storage and Processing of Agricultural Products, students of groups 24-37)

In order for the vision system of the robot eye analyzer to recognize all colors like the human eye, robots must be so developed that they can fully identify all 14 colors like the human eye. It is necessary to create an array of sequences for comparing the desired color with other color images in the color database (DB), create recognition criteria, an algorithm and software.

The recognition algorithm has the ability to search for 5 types of objects:

1. Object search by codes.

2. Object search by pixels.

3. Object search by statistical residual dispersion method.

4. Object search by coefficient correlation.

5. Object recognition by multi-criteria dispersion method.

Using the above search criteria, the basis of the dissertation work was taken as the basis for the identification and recognition of facial images, the residual variance and coefficient correlation methods.

Having deeply analyzed the above algorithms, the process of recognizing the image in Figure 3.3 from objects of other colors was started by creating a program with 2 methods. To check how accurately the algorithm works, in the first method, two identical images and the third one with a different color 14 were taken, the process of comparing them and finding the desired color and its number from them was carried out using the residual variance and coefficient correlation methods. Let us solve the problem of determining the amount and total number of the required colors using the color identification method and separating them. The input parameters need to be converted into a three-dimensional matrix:

$$Aq \{M, N, K\}, \qquad (1)$$

where M is the number of columns of our matrix and N is the number of rows of our given matrix, K is the number of colors or classes.

Algorithm condition. The color recognition and classification classifier consists of the following steps:

1. K-color classes are selected for the color of the color image obtained from the video images and placed in the matrix $A[n][m][k]$ and its form is extracted;

2. The number of M,

N, K from the color matrix separated into classes is determined.

3. The presence of a class or how many colors in the resulting color image, the number of each

color, the number of columns and rows of the color matrix are determined.

4. Each color or class is analyzed based on the created criteria.

To solve all the above problems, an algorithm, criteria and software in C++ for a classifier that recognizes 14 different colors were created and its main window is shown in Figure 1.

Figure 1. The main window of the color recognition program

The "Color Array" button in the main window is used to select the "Color Array" in sequence, and the desired color array of 14 different colors is created on the main window screen. By clicking the "OK" button, you can select the color "Yellow" and its number from the color array.

The program was written in C++ and although many methods have been developed for the process of recognizing the desired color from the MB, as a result of eliminating the shortcomings of these methods, a program was created with a recognition probability of more than 0.95%, the program has a memory of 2.02 MB and a matrix of 297 x 112, and its "C++ software" was created.

The program "Comparison and similarity of cloud images". The basis of this program is the correlation coefficient method, the main condition of the program is as follows, the goal is to find the most similar between two images with a correlation coefficient density value of more than 0.95%.

In this program, we are given the problem of determining whether the images 1 and 2 are similar and 3 are different (Figure 2).

Figure 2. Identification of the selected image based on features

Algorithm condition. If the probability of similarity between the first pixel in the main image, the first row pixel in Figure 1, and the first row pixel in Figure 2 is higher than 0.95%, we assign the value 1. Otherwise, if it is lower than 0.95%, we assign it to 0. This condition is implemented in all columns, as a result, a two-dimensional matrix consisting of 0 and 1 is formed, and the probability of similarity is checked in percent by the sum of 1s.

In conclusion, we believe that applying the correlation coefficient method to the criteria for comparing images and determining their similarity can provide creative results.

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