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ONE WAY TO IDENTIFY A PERSON BASED ON THEIR IMAGE IS TO PROVIDE SECURITY

Mahkamov Anvarjon Abdujabborovich
Department of "Modern Information and Communication Technologies" International Islamic Academy of Uzbekistan
mahkamovanvarjon2020@gmail.com

ABSTRACT

This paper proposes a distance-to-standard algorithm, which is one of the identity recognition algorithms, and this algorithm is implemented in two stages. In the images given in the first stage, the formation of reference objects is carried out. In the second stage, a decision is made. The proposed algorithm can be used in the organization of software packages of different types, aimed at solving the problem of classification of objects given in the form of images[1-3].

KEYWORDS: biometrics, digital image, recognition, ear image, character separation, filter, Gabor filter, Gaussian function, geometric character separation method

INTRODUCTION

To date, the issues of identification and security based on biometric technologies have been studied as one of the most pressing issues since the 1950 s. As these problems are widely used in the national economy, there is a growing interest in solving them. The problem of identification based on the image of a person is also one of these problems. Therefore, in this study, the identification of the person was carried out on the basis of the image[4-8].

THE PURPOSE OF THE WORK

Development of an algorithm for identifying a person using the method of distance to the standard, using the characteristics of the image in the recognition of the person on the basis of the image.

Problem statement

Suppose you have multiple images of approximately the same size in the database. To achieve the above goal, it is necessary to solve the following problem. Implementation of the problem of classification on the basis of selected characters using the method of distance to the standard using an algorithm for recognizing a person on the basis of facial expressions.

HOW TO SOLVE THE PROBLEM

In order to implement the technology of identification by image, it is necessary to first distinguish the identification marks on it. Identification marks are the signs that distinguish a person from each other. Separation of identification marks [9-17] is carried out in the study, and it is proposed to use this method to identify the person on the basis of the image using the method of recognition based on the method of distance to the standard.

The basic idea of the recognition method, which is based on the distance method to ethanol, is to check or calculate the proximity of objects belonging to the same class to each other. In the recognition method based on the distance to ethanol method, a decision is made based on the estimation of this proximity quantity[18-22].

Suppose that an n-dimensional vector is set for each object in the character space. In that case, the distance between two vectors is given as a measure of the amount of belonging and proximity of the objects to each other.

As you know, everyone in character space $\bar{a} = (a_1, \ldots, a_n)$ a point corresponds to the vector [3-10]. The distance between two points is calculated using different metrics. An example of such a metric is the Euclidean metric:

Euclidean metrics $l(\bar{a}, \bar{b}) = \left(\sum_{i=1}^{n} (a_i - b_i)^2 \right)^{\frac{1}{2}}$.

Algorithms based on the distance to the standard method are implemented in two stages:

1. Formation of reference objects. The main idea of the stage of formation of reference objects is to identify the object that characterizes the objects of each class [23-29]. In most cases, the reference is the number of objects that belong to a particular class

m_j if so, then

$$\bar{a}_j = \frac{1}{m} \sum_{\bar{a} \in K_j} \bar{a}$$

can take.

2. Decision-making rule. In this method, the decision is made as follows. Suppose the proximity between two vectors l determined by metrics. In that case with the object K_μ The distance between classes is determined as follows: $l_u = l(S_u, S)$. If $l_j = \min_{1 \le U \le l} \{l_n\}$ if so $\bar{x}$ object K_j belongs to the class. The reliability of the recognition algorithm

$$d_j = \frac{1}{\sum_{\substack{v=1 \\ v=j}}^{l} l_v^{-1}}$$

is calculated by the formula.

Using the method described above, when comparing the levels of similarity of two images with each other on the basis of a facial image, reference is made to the database on which the facial images are placed. Figure 1 shows examples of facial images of several individuals in the database.

Figure 1. Appearance of images taken for comparison

The following table presents the results of estimating the degree of similarity between the two images using facial image markers based on the recognition method mentioned above.

Experimental results of the recognition method based on the distance to the standard

Table 1

Methods of recognition	Character separation method	Experience number	Number of pieces	Number of ellipses	Number of characters	Recognition accuracy (%)
Distance to standard method	Circle					
		1	1	2	4	63,71
		2	2	4	16	68,16
		3	12	2	48	79,74
		4	4	5	40	83,6
		5	4	8	64	83,74
		6	9	2	36	81,5
		7	9	5	90	84,2
		8	9	8	144	85,8
		9	16	3	96	86,74
		10	25	2	100	85,4

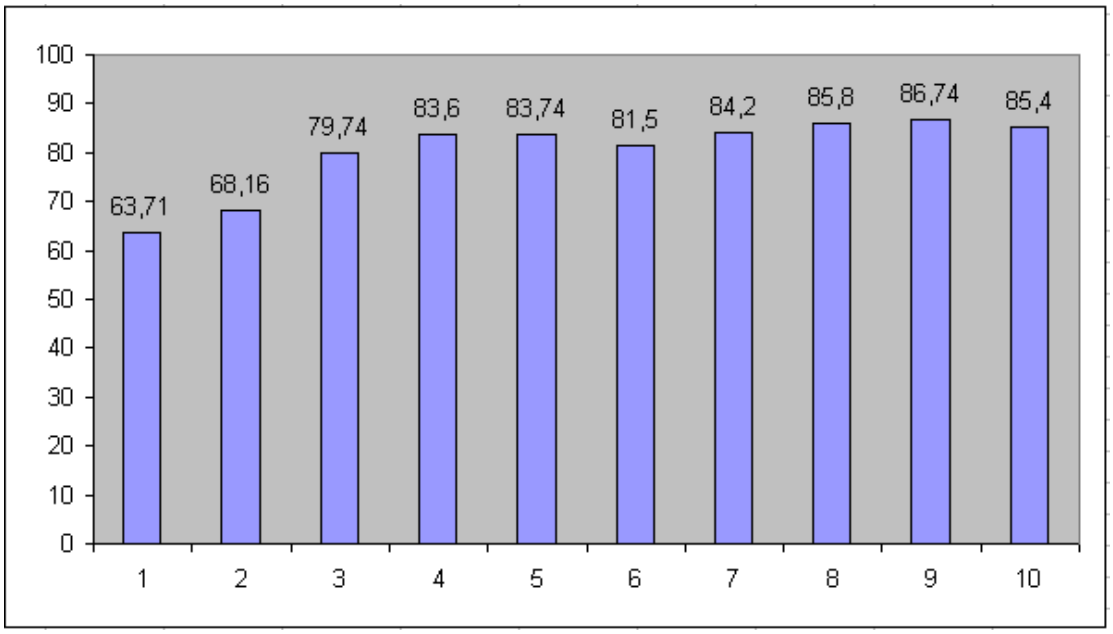

Figure 1 is a graphical representation of the results obtained

CONCLUSIONS

Based on the results of the experiments, it can be said that if we look at the results of the experiments to identify a person by facial image in the above-mentioned method, the highest accuracy was 86.74%.

In summary, the lower the level of accuracy was achieved when the time intervals for the images obtained in the recognition method based on the distance to the standard method were large and the database was large.

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