

## HEUVRISTIC METHODS OF PROCESSING FACE IMAGES IN IDENTIFICATION

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**Annotatsiya:** *This article describes the problem of forming the initial processing of facial images on the basis of the theory of heuristic methods and analysis of the development of computational methods, improving quality control based on mathematical algorithms, on the other hand, the problems of intellectual analysis of data and their application.*

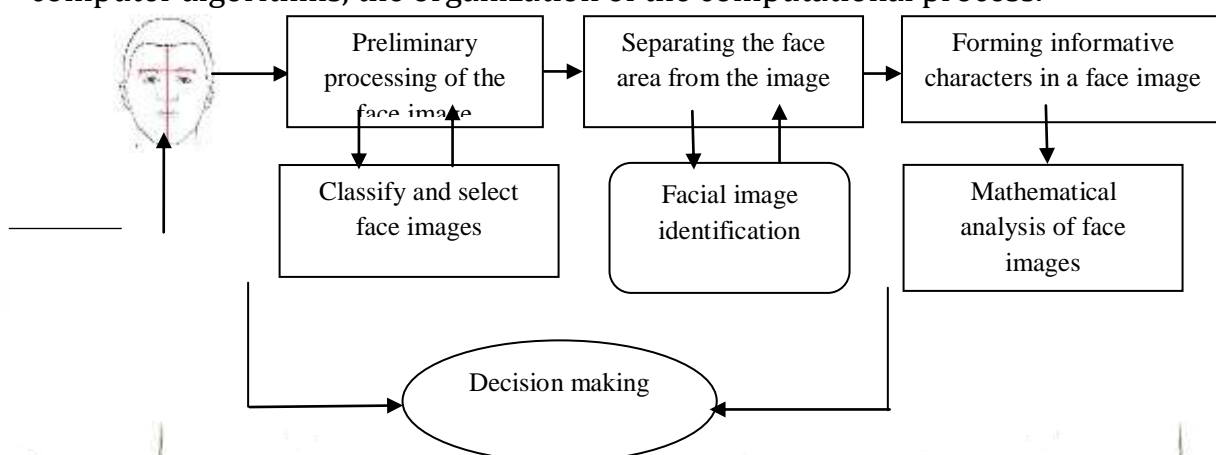
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One of the most pressing issues facing manufacturers today is the identification and identification systems are based on biometric systems. A special place in this area is occupied by the development of automatic identification systems based on facial images.

Also, heuristic methods of processing facial images in identification are based on principles (requirements and rules) that determine the strategy and tactics of decision makers in solving poorly defined and ambiguous problems. At the same time, they allow the development of new ideas in the decision-making process, and their use allows to increase the effectiveness of solving management tasks.

We also briefly describe the most commonly used complex methods in decision making practice. It is the main instrumental computer system of facial image processing, and its access and processing algorithms, the sequence of processing steps have certain requirements.

Picture 1 shows the problem of shaping the heuristic processing of facial images, improving the quality control of the initial processing of facial images, on the other hand, the storage, processing and management of facial images, the appearance of computer algorithms, the organization of the computational process.



### Picture 1. Heuristic scheme of face image

**Preliminary processing of the face image.** The solutions used here must first store the data on electronic computers and then use the necessary processing space. The main processes at this stage are discretization, quantization of the facial image, and the placement of quality enhanced facial images into computer memory.

Also, a source in the form of a numeric matrix is said to be compressed to an image in the form of a new numerical matrix in the initial processing of the image. The main activities of this stage are the production of visual qualities and the restoration of lost information.

**Separating the face from the image.** The main purpose of this stage is to separate the face from the image and preserve the character's character and shape. For example, the initial processing of a face image into a face image is output to an image in the form of a 3x4 numerical matrix (clear image, amplification of certain parts of the image, etc.).

**Formation of informative signs in the face image.** Character Formation — The first stages of any emblem recognition system are discussed. The improvement of the whole system depends on how well the characters are selected to classify the quality object [1]. In this case, the object is described.

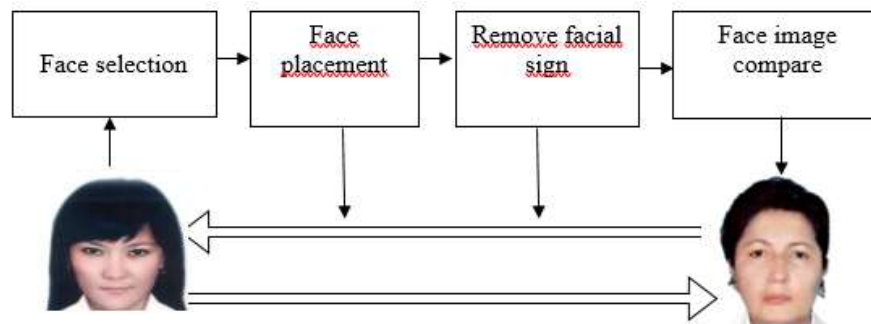
Character formation tasks are associated with the loss of a product heuristic method, which is highly dependent on the experience and character of the character who produces the injury, the image depiction, or the character set injury. It also creates image structures from the face image or creates stunning images when bringing face images to a single value view. Bringing an image to a graphical view makes it much easier to remove, define, and change the settings of the face image. [1-2]. These step-by-step operations improve fragmentation, contour skeletal separation.

**Classification and selection of facial images** - using the results of the analysis, the facial image and its objects are classified and selected. These steps do not have to be fully applied in any practical matter, nor are they required to be performed in the order given. For example, the problem of classifying and recognizing images can be solved directly in the source image obtained in the first stage, without any other steps.

**Mathematical analysis of facial images** - in the stage, the image and the objects in it are described by measuring fragments and various mathematical parameters, identifying the signs. The main operations of this stage are the process of measuring the geometric and statistical structure of the parameters of the face image and other symbols [2].

**Decision making.** The processing and analysis of facial images in heuristic methods is used in decision-making in areas of the individual's activities that are related to facial images and where the computer can be used. In addition, it is also based on the creation of a classification method of identification and identification, as the facial features of the person are identified and a decision-making module is selected by the expert to identify the person (Picture 2).





**Picture 2. Facial image classification module**

Picture 2 shows the steps of the modular system of facial image classification for expert decision-making for the implementation of a sequential system of identification and identification:

**facial image selection module (facial contour)** - tracking and selection of faces using the tracking module, which identifies the segments corresponding to the persons in the background, captured on camera;

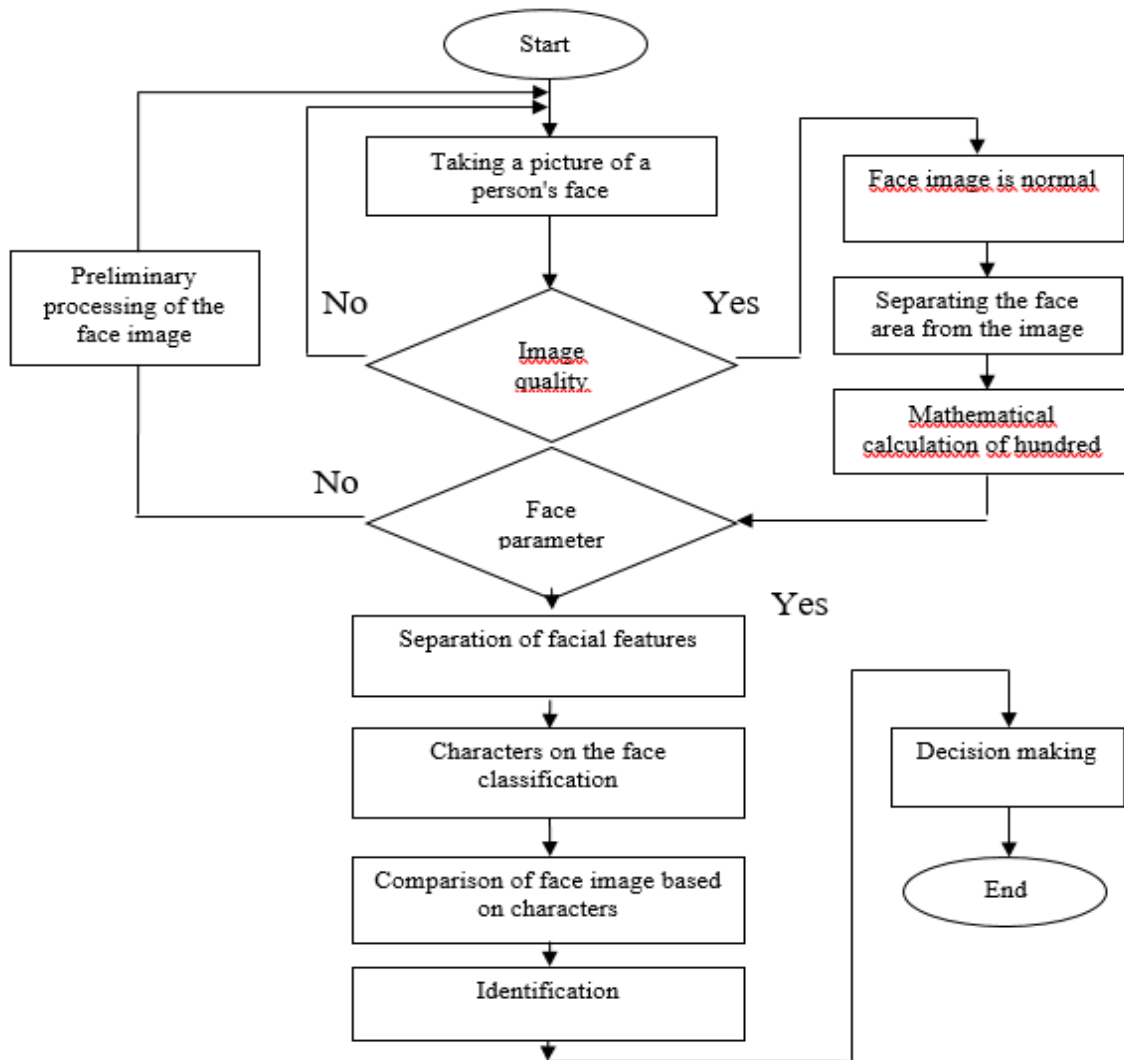
**a facial image positioning module** - is designed to achieve more precise localization of the face and subsequent normalization. Some elements of the face, such as the eyes, nose, mouth, and hair, are localized. Based on this, the input image is normalized to the geometric properties (size, location, size, direction) by encoding the geometric changes. Often a person's facial image is normalized to light and gray level photometric features.

**face image character module** - different person face images are defined by separating the characters and the face image is reflected in geometric points.

The facial image comparison module or classifier should take into account the parameter dimensions of the face image of the person involved and ensure that it compares with the parameters of the facial image of the person in the database. The results of the face detection process depend on the parameters of the face image. These are:

- divide into shapes and classes according to symptoms;
- comparison and statistical analysis.

In the process of image classification, it is necessary to check the reliability of the criteria [3-4]. Classifiers consist of an algorithm designed to solve structural analysis, facial recognition, and identification problems in digital images captured by a video camera, camcorder, or various scanners (Picture 3).



**Picture 3. Block diagram of a heuristic algorithm for identification**

As a result of the research, the theory of methods of initial processing and heuristic analysis of images and the development of computational tools serve to form a mathematical model and algorithm of the face image shown in Picture 1-2-3 [4]. It is also based on the basic principles of decision-making algorithms that directly confirm the authenticity of the facial image of the person in matters of intellectual analysis of identity.

In conclusion, the problem of shaping the heuristic processing of facial images can be improved by improving the quality control of facial imaging, on the other hand, the basic principles of direct verification of facial expressions and expert decision-making in intellectual data analysis.

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