

26. FACE RECOGNITION TECHNOLOGY DEVELOPMENT

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The paper deals with the process of development of face recognition technology today.

Nowadays people are recognizing visual patterns all the time and obtain visual information. This information is recognized by the brain as meaningful concepts. For a computer, whether it is a picture or a video, it is a matrix of many pixels. The machine should find out what concept a certain part of the information represents in the data. This is a rough classification problem in visual model recognition.

For face recognition, it is necessary to distinguish who the face belongs to in the part of the data that all machines think of the face. This is a subdivision problem. Face recognition in a broad sense includes related technologies for building a face recognition system. It includes face detection, face position, identity recognition, image preprocessing, etc. The concept of face detection algorithm is to find out the coordinate system of all faces in one image. This is the process of scanning the entire image to determine whether the candidate area is a face [1].

Design, engineering and development of component parts of the systems are important, but the development of a biometric system as a whole is the most critical aspect to successful system deployment. Biometric system operations include enrollment operations and capture and matching ones.

Enrollment of a new subject into a biometric system is achieved by performing the functions denoted in the upper processes: present biometric (A), capture sample (B), process into reference format (C), and add reference (E). The processes are illustrated in Figure 1.

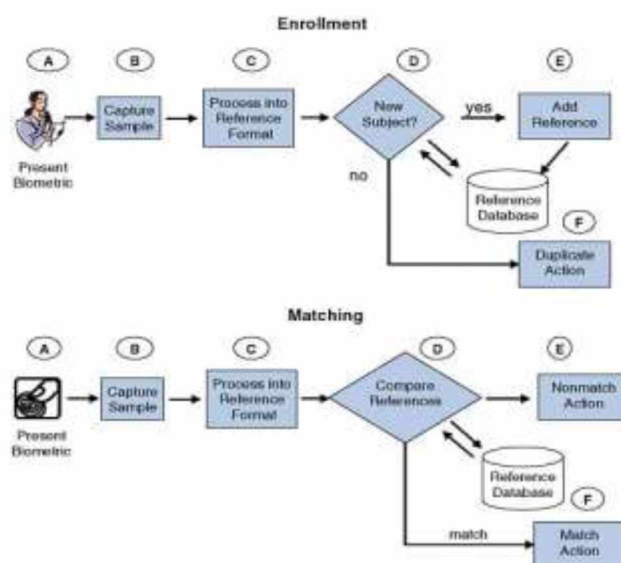


Figure 1 – Idealised operations of a generic biometric system

The samples are analysed and then processed to form references that are stored for future comparison in a database or on transportable media such as a smart card.

The processes A, B, C, D, E, and F illustrated in Figure 1 are carried out to capture one or more biometric samples and compare them against the reference. When it is possible, a sample to be used for comparison against a stored reference is analysed to ensure adequate quality consistent with the feature extraction and matching algorithms applied. When the user is cooperative and the sample quality is inadequate, acquisition attempts may be repeated up to a permitted maximum number of times until a suitable sample is obtained. If adequate quality is not attained, depending on policy, either the best sample is used or “failure to acquire” is declared and a fallback procedure invoked [2].

References:

1. A Review of Face Recognition Technology [Electronic resource]. – Mode of access: <https://ieeexplore.ieee.org/abstract/document/9145558> – Date of access: 16.03.2023
2. Biometric Recognition [Electronic resource]. – Mode of access: <https://nap.nationalacademies.org/read/12720/chapter/4> – Date of access: 14.03.2023