

Face Recognition

Face recognition is the most promising biometric technique for overcrowded zones (airports, rail stations, etc.) because it relies on distant cameras to identify people. The identification from video cameras is a daunting task for human investigators who would have to remember several hundred faces and match them against tens of thousands of faces during a day.

Automatic face recognition can be used as a screening method that selects only those people that are worth checking: the final decision on their identity can then be made by an operator (security monitor, pocket pc, etc.)

Law enforcement agencies use face recognition for automatic mugshot database reduction in their forensic investigative work

Morpheus FR

Morpheus FR SDK includes all the software modules that are necessary to build and compare biometric templates relative to human faces. The library supplies all the modules that are necessary for building and comparing biometric templates.



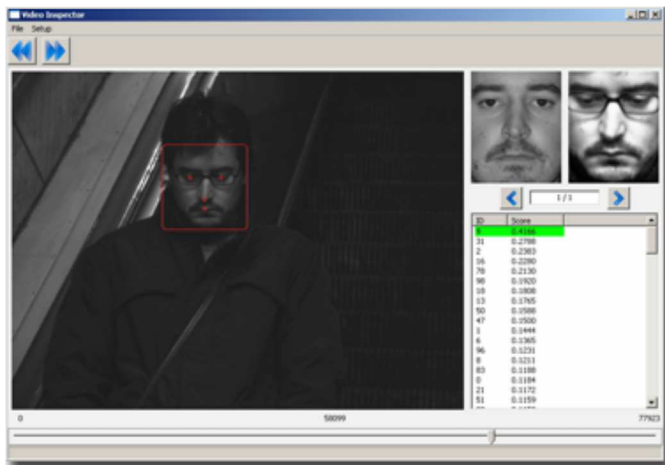
Face Detection - Finds the position and the size of each one of the visible faces in the image

Face Normalization - Marks points of morphological interest throughout the face area (eyes, mouth, and eyebrows) in order to properly rotate and scale the image. This operation moves all such points to pre-defined locations

Feature Extraction - Selects relevant features from the normalized image in order to maximize the robustness against environmental disturbance and noise, non-optimal pose, non-neutral facial expressions and variable illumination conditions

Biometric Template Creation - The extracted feature vector template is processed by a trained statistical engine. The feature vector is reduced to a smaller one that optimally describes the user's identity

Biometric Template Matching - The face recognition and the face verification processes are based on measurements of differences between biometric templates. The normalized template distance is the similarity value of the compared identities



Technical Data

Valid input: IEEE1394 cameras, USB cameras, image files. Compatible with Microsoft Direct Show capturing systems.

Output: face position, eye and mouth position, biometric template, templates comparison score.

Biometric Template minimum size: 1.0 KB

Morpheus FR SDK: C, C++, C#, Visual Basic API for Microsoft Visual Studio 6 or above (Microsoft Visual Studio 2005 recommended), Sample Applications, Developer Documentation.

Morpheus FR Algorithm:

- Accurate localization of facial features (eyes, mouth, eyebrows etc.)
 - Robust against unfavourable illumination conditions
 - Robust against occlusions (dark sunglasses, scarves, etc.)
 - Tuned for medium-to-low facial image resolution (70-35 px eye-to-eye distance)
 - Tuned for uncontrolled facial image (works at the best with a max deviation of 10 degrees from the frontal position and tolerates deviation of 20 degrees)
 - Fast template generation 10 biometric templates per second (*)
 - Fast similarity score generation 500.000 templates per second (*)
- (*) cpu entry level Core 2 Duo 1.86 GHz, digital camera resolution 1024x768 pixels

Minimal system configuration requirements: Intel Core 2 Duo or comparable, 1024 MB RAM, 200 MB of available hard disk space, operating system Windows XP, Vista, 2003 (porting on Linux upon request)