



Benefits of using mobile devices to determine person's Identity or verify person's identity

Security personnel, police officers or even troops in the field have a compelling need to make decisions based on the current situation they are in. Very often they lack intensive communication channels to their central command.

They have to

- Feature tools to make good decisions for detaining suspects
- Provide security and feel secure themselves
- Have minimal impact on individuals not involved in the current situation

How can Face Recognition help in the field?

Face recognition biometrics is widely used to tell people apart. I.E. Face recognition is suitable to help determine a person's identity based on the facial evidence.

Assuming there is a list of known suspects (e.g. hooligans in football stadium, shoplifters in a shopping mall) and that security staff is patrolling the area, a mobile device with face recognition technology installed provides the ability to

- Capture persons facial image in the field
- Check if the captured person's face is similar to a face enrolled in the local database of the device, i.e. a face of a suspect person
- Take action based on the result (i.e. take the suspect to the central station for further investigation)

What does Cognitec provide?

Cognitec provides Face Recognition Technology, applicable to various scenarios. For the scenario shown above, Cognitec provides the FaceVACS-SDK product containing all face recognition functionality accessible through Application Programming Interfaces (API's).

FaceVACS-SDK works on various computing platforms including those typically used in the mobile device arena. Those platforms are characterized by limited computing performance provided by their CPU's compared to general purpose CPUs, limited clock rates (because of power consumption) and also limited available and possible main memory.

Technical Challenges

Cognitec recognizes the need for face recognition on those platforms and has undertaken research and development to offer a FaceVACS engine that is

1. Capable in dealing with CPU limitations (e.g. only fixed point operations).
2. Capable in dealing with limited available main memory to store algorithm parameters
3. Still delivering biometric performance that is as good as Cognitec's state of the art algorithms on general purpose computing platforms

Proof of Concept

PDA and PDA like devices; specifically rugged devices are most often based on Intel® XScale CPU's. FaceVACS-SDK supports XScale CPU systems devices with Windows Mobile version 6.2 as one major mobile platform.

Other platforms will be supported by Cognitec as opportunities arise. Please check the current SDK specification or ask Cognitec sales if your specific platform is already supported, will be supported in the future or requires special engineering.

Mobile Application on MC75 device

The Motorola MC75 is a mobile device currently showing Cognitec's face recognition capabilities on XScale / Windows Mobile platform. Specifically the MC 75 runs an XScale 280 CPU at 624 MHz with 128 MByte of RAM. Windows Mobile 6.2 operating system leaves about 64 MByte of this RAM for customer application and that is sufficient to run FaceVACS SDK redistributable components together with the mobile application.

Camera

The MC75 incorporates a 2 MPixel camera that is mounted in the back of the device. The mounting position is important for the usability of the device. The operator can see the operation screen as well as the applicant during capture for convenient ease of use.



Operating the Application

Capturing ...

... Captures the facial traits of a person conveniently for both the person being photographed and the operator, resulting in good quality images suitable for automatic and manual facial recognition.

The application uses the built-in camera letting the operator obtain an image and then checks the image quality immediately after capture. Eye positions are automatically annotated and indicate the (correctly found) face position.

Enrollment ...

... Allows registering a captured person in the field for later comparison and recognition, and relay of the image to a central database or similar.

After Capturing, the operator will decide what to do next. One option is enrolment. The system generates the biometric template and stores it in the repository associated to the captured image for later reference.

The operator can assign a meaningful identifier (e.g. a name or case ID) to the enrolment.

Identification

The core idea of this application is to allow operators to decide in the field if a suspect person requires special care or action because they are already known and loaded in the watch list.

Thus, the operator captures a person as described above and initiates an identification (Match against all enrolled images)

The resulting match list is presented and the operator can browse through each match by pointing at the appropriate buttons on the touch screen. Rank and score of the match are displayed on top.

The operator can quickly change between match and reference images by clicking on the image itself for easier manual verification.

