Speech Technology Center

SMART Tracker FRS

Face recognition solution for real-time biometric search and facial DB management in law-enforcement and security agencies

Video surveillance becomes more and more significant component in complex security systems as due to criminal situation, terrorist threats, vulnerability of strategic facilities distributed video surveillance systems with efficient video analytics capabilities can be quite efficient in investigative activities.

By concentrating people at high density in accessible places, at regular or predictable times, mass gatherings present the opportunity for terrorists to inflict mass casualties, cause economic damage, and instill public fear.

Next-generation intellectual video surveillance systems should be deployed in places of mass gathering. Such systems may contain "state-of-the-art" face recognition technologies allowing real-time biometric identification of the potentially dangerous persons. Most commonly "hidden" checkpoints can be found in the entry and exit zones of train stations, stadiums, subways, airports and in any other place, where the speed of a stream of people is limited.

SMART Tracker FRS deployed in a real-time mode has the following performance parameters: a dangerous person will be detected in 97 cases of 100 in 1-3 seconds. STC solution SMART Tracker FRS can be used as an ideal tool for creation forensic photo-archives. Biometric identification procedure takes only 3 seconds within the database containing 1 million cards. Any source can be used to upload new facial pictures into database.

APPLICATIONS:

- Transportation: train stations, marine and river terminals; subway; airports
- Recreational facilities
- Strategic facilities
- City infrastructure

ADVANTAGES:

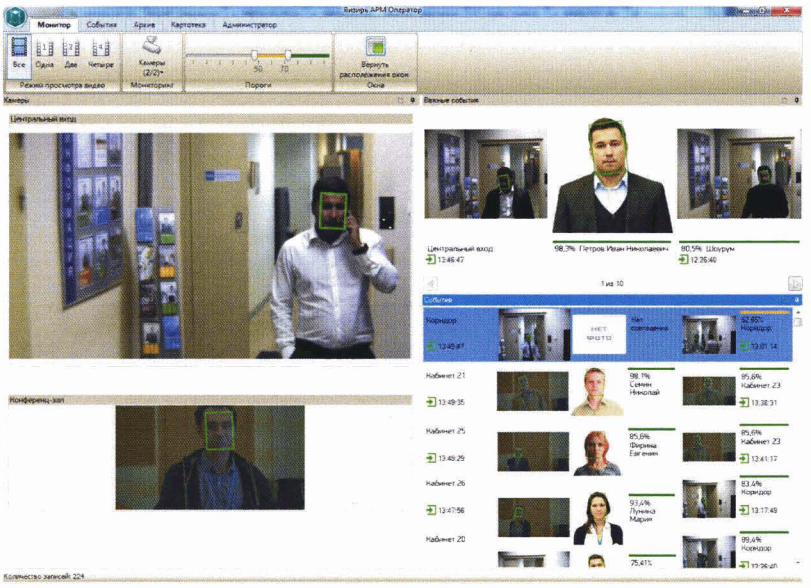
- Real time face detection and tracking in video stream
- Algorithms independence of aging, beard and hairstyle changes, skin color changes
- Adaptation to lighting conditions
- Image visualization on the monitor: live video and identified faces
- Navigation in video archive and database and saving of all the required parameters

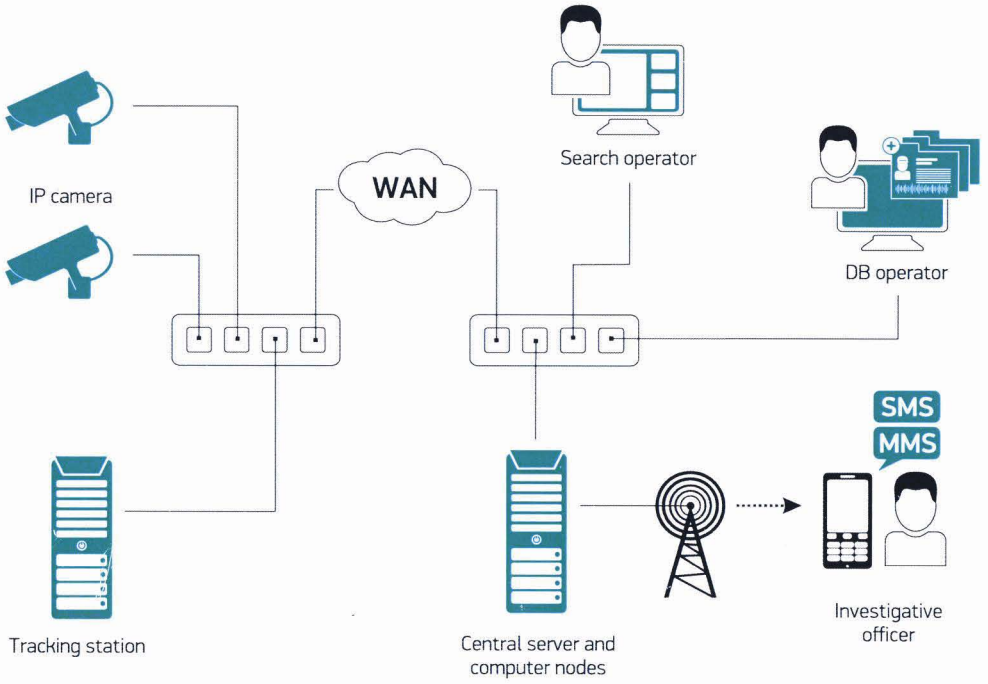
FUNCTIONS:

- Face detection in live stream
- Biometric search in real time and on request
- Notifications on operators' desktops, by e-mail, SMS, MMS
- Video streaming archives, linking of identification procedures with video-recording
- Database (up to several millions cards) containing facial pictures with metadata
- Facial images can be uploaded into a database from any source: photographs, video-files, photo-cameras, scanners, web-cameras, CCTV cameras
- Automatic quality assessment of uploaded pictures by ISO 19794-5 standard
- Full workflow automation, access rights limitations, user activity audit

TASKS:

- Real-time detection of wanted persons
- Structured database of facial data and metadata
- Search in database by photographs and metadata





CHARACTERISTICS:

Customer convenience:

- Fully automatic image preprocessing
- User-friendly interface
- Built-in context help

Accuracy:

- 97% of correct matches in case of 1% of false acceptance rate
- 100% correctly matched facial samples in 1 million database in case of analysis by the operator 10 best results on the database according to ISO 19794-5 standards

Performance:

- Identification result in 1-3 seconds
- Biometric search in 1 million database in 3 seconds
- Minimal image requirements for facial recognition
- Inter-pupil spacing larger than 32 pixels
- Pose up to +/-15° deviation from frontal image
- Batch input and integration with the existing databases

Failure tolerance:

- Fully distributed architecture
- Back-up at all levels and redundancy
- Quick recovery and robustness to hardware malfunction

Biometric database management:

- Built-in image quality assessment by ISO 19794-5 standard
- Face detection in video-recordings and group images, subsequent card creation automatically
- Controlled input of facial images thanks to the integration with photo-cameras, web-cameras and scanners

Security

- Group- and role-based access control to system functionality
- User actions logging on central server and user activity audit tools
- Link between system components based on HTTPS protocol

Scalability:

- Up to 12 cameras connected to 1 tracking station
- Up to 8 tracking stations connected to 1 computing node
- Up to 30 computing node connected to 1 central server
- Up to 500 users for 1 central server

Easy deployment:

- Web-based interface is enough for execution most of the activities, no need to install the system on PC
- Minimum requirements to network capacity allow usage of the existing IT-infrastructure

REQUIREMENTS TO CONTROL POINT

- **Distance between camera and control zone is from 1.5 to 30 meters (depends on lens used)**
- **Control zone breadth (picture width): 2 meters**
- **Max. quantity of faces in video stream: up to 5**
- **Lightning conditions in control zone: 300-1000 lux**

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