TFACE-RECOGNITION v1.0

Video Analysis for face recognition

The video analysis function **TFace-Recognition** allows to detect and notify automatically and in real time the identity of a person among the ones stored in a reference image database, by biometric face recognition.

Law Enforcement

Identification of suspects, wanted criminals, shoplifters, missing persons

Screening of persons at borders, sensitive places or critical infrastructures

Forensic investigations

Access Control

Automatic access management for restricted areas, buildings and facilities

Identification of unauthorized, unknown or unwanted persons

Device or process login

Business Intelligence

Identification of VIP or loyal customers

Digital signage and tailored messages management

TECHNICAL SPECIFICATIONS

General architecture

Modular and hardware-independent software architecture, available for Windows o.s. 32/64bit

Video flow acquisition from:
- o IP cameras (optical or thermal), compatible* or acquirable through standard protocols rtp/rtsp, mjpeg or ONVIF
- o analogue cameras (optical or thermal) through IP video encoders or hybrid DVR/NVR, compatible or acquirable through standard protocols rtp/rtsp, mjpeg or ONVIF
- o compatible VMS/DVR/NVR platforms
- o off-line videos in all standard formats (avi, asf, mpg, mov, …)

Automatic and real time notifications to:
- o TechnoAware-CentralManager client, local or remote
- o compatible VMS/DVR/NVR platforms
- o I/O contacts through Modbus protocol
- o network http or TCP notification, customizable
- o e-mail, with in attachment the image related to the generated alarm (with in overlay the bounding box and the trajectory of the detected target)
- o FTP client, saving the video clip related to the generated alarm (with overlay of the bounding box and the trajectory of the detected target)

Enrolment of the faces images through:
- o Real time acquisition of the detected face
- o Import faces images and data coming from external databases (police mugshots, personnel archives, …)
- o Manual entry of images or off-line videos

Identity data editing by:
- o Manual entry
- o Data import from external databases (by project)

Ability to configure real time alarm notifications in case of:
- o Person recognized among a configured group of persons stored in the database
- o Person recognized, but not present in any of the configured groups of persons in the database
- o Person unknown

Ability to detect and identify several faces present in the image at the same time

TechnoAware-CentralManager for:
- o centralized configuration of unlimited local and/or remote VTrack modules
- o automatic detection of all VTrack servers connected in the same sub-network
- o centralized real time live view of the connected local and/or remote VTrack modules
- o centralized real time visualization and management of the alarms, notified by unlimited connected local and/or remote VTrack modules
- o real time or off line simulation of the processing results, to verify the correctness of the configuration
- o visualization of the bounding box and trajectories of the detected targets, either in the live view and in the alarms panel
- o recording and storing in local directories of continuous or event-based video clips
- o centralized configuration of different user levels, allowing or inhibiting for each one of them the access to specific areas of the module
- o ability to generate reports of the alarm events occurred in a defined timeframe, in PDF format
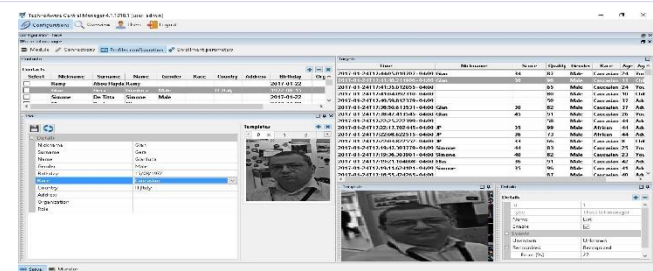
Off-line interrogation of the identified faces database, time-based or by individual face search

Enabling/disabling of the modules by:
- o an interrupt from an external input, through cgi call
- o the polling of the status of an external I/O contact, through http or TCP call
- o time scheduling, by timetabled configuration
- o manually, by TechnoAware-CentralManager interface

Ability to stream out the real time processed video flow with data overlays by rtsp protocol, for being acquired by compatible* third parties platforms

Module configuration features

Ability to set up unlimited cameras and parameters configurations, according to timetabled or manual scheduling

Ability to import/export a configuration database previously set up

Unlimited configurable independent alarm zones, of any shape and size

Ability to crop and process independently unlimited image portions of the acquired video flow

Unlimited configurable no-processing zones, to inhibit not-of-interest areas in the image

Ability to manage different configurations for different configured presets of a PTZ camera

Ability to process the acquired video flow at a lower resolution and frame rate

Diagnostic

Watchdog function, for the automatic restart of the module in case of critical error or manual restart of the hardware unit

HeartBeat function, for periodical notification of the correct working of the module to an external device

Ability to check the status of the active configuration by html/xml request, or by using the relative view in the VTrack-CentralManager

Tampering function, to trigger an alarm on detection of camera obscured, dazzled or moved for longer than a configured time

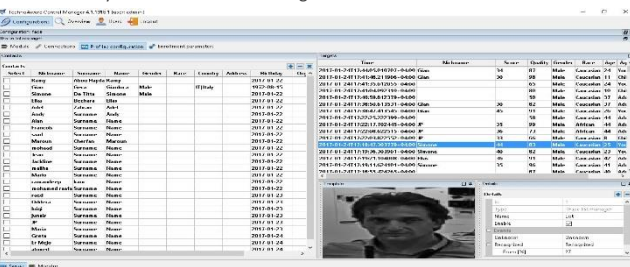VideoLoss function, to trigger an alarm on the loss of the video flow communication to the module

Licensing

Licensing per each video flow

No server licenses needed, no added plug-in licenses needed

Local or remote VTrack license management through TechnoAware-CentralManager client

Full availability of failover license management

TECHNICAL REQUIREMENTS

Conditions of the target in the image in order to be effectively detected:
- o clearly visible to the naked eye in the image, even in difficult environmental conditions (night, heavy rain, snow, fog, sun glare, reflections, artificial lights, under/overexposed camera, obstacles, …)
- o entirely visible in the indicated proper conditions in the image for at least 10-15 continuous frames
- o minimum resolution required: in order to guarantee at least 80 pixels eye-to-eye at the point where the face is meant to be identified
- o angle of pan and tilt inclination of the camera in respect with the perpendicular of face plane: not wider than 20°-25°

Supported OS: Windows 7 and later ones

Computational need (see the table on the right):
- o CPU: about 125k comparisons/second, with a single core 3,2GHz
- o RAM: about 9kB per enrolled template

TFace-Recognition CPU calculator	Number of comparisons/second with a single core 3,2GHz	Number of identities in the database	Number of identities in the database	Number of identities in the database	Number of identities in the database	Number of identities in the database
	125000	1.000	10.000	100.000	1.000.000	10.000.000
Maximum expected number of faces present in each image	2	Suggested number of templates/identity to be enrolled	Minimum number of cores 3,2GHz equivalent required	Minimum number of cores 3,2GHz equivalent required	Minimum number of cores 3,2GHz equivalent required	Minimum number of cores 3,2GHz equivalent required	Minimum number of cores 3,2GHz equivalent required
Extremely collaborative (Access control, with door)		1	1	1	2	16	160
Extremely collaborative (obligated passage, but without blocking doors)		9	1	2	144	1.440
Not-collaborative (free flow along streets)		90	2	15	144	1.440	14.400

TFace-Recognition RAM calculator	MB of RAM/template	Number of identities in the database	Number of identities in the database	Number of identities in the database	Number of identities in the database	Number of identities in the database
	0,09	1.000	10.000	100.000	1.000.000	10.000.000
		Suggested number of templates/identity to be enrolled	Minimum MB RAM required	Minimum MB RAM required	Minimum MB RAM required	Minimum MB RAM required	Minimum MB RAM required
Extremely collaborative (Access control, with door)		1	90	900	9.000	90.000	900.000
Extremely collaborative (obligated passage, but without blocking doors)		9	810	8.100	81.000	810.000	8.100.000
Not-collaborative (free flow along streets)		90	8.100	81.000	810.000	8.100.000	81.000.000