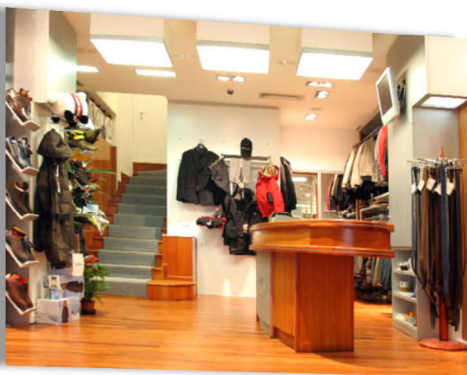


The function **VTrack-GateFlow** allows the counting and collection of the number of persons crossing virtual gates in a certain direction

- ✓ real-time visualization by web interface of the number of persons who are passing through each configured virtual gate
- ✓ off-line visualization by web interface of the stored data of the number of persons who passed through a configured virtual gate within a given timeframe
- ✓ centralization and correlation of counting data coming from multiple configured virtual gates, with generation of an alarm if a configurable counting threshold is exceeded
- ✓ generation of reports in csv format



ANALYSIS OF PEOPLE FLOWS FOR RETAIL AND BUSINESS INTELLIGENCE

- ◆ More targeted and effective marketing actions
- ◆ Increasing the effectiveness of trade promotion

...through collecting the data related to the flow of customers, for verifying the ratio between the presence and the selling, or the best placement of a product, or the impact of a promotional campaign

OPTIMIZATION OF SERVICES AND MANAGEMENT

- ◆ Increasing of the efficiency of personnel and facilities
- ◆ Significant reduction of management costs
- ◆ Monitoring of the utilization of services and facilities

...through the verification of the data related to the flow of customers for the optimization of personnel displacement, of the time of opening/closure of cash, shops, branches, facilities or services

MORE EFFECTIVE VIDEOSURVEILLANCE FOR SAFETY AND SECURITY

- ◆ Prevention of critical situations for persons and facilities

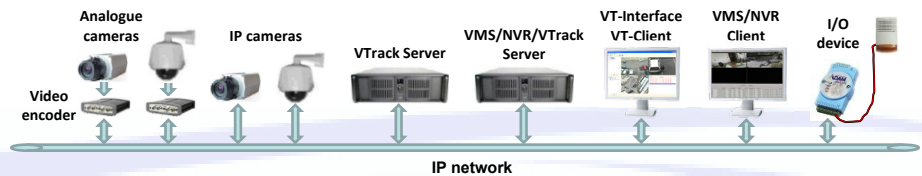
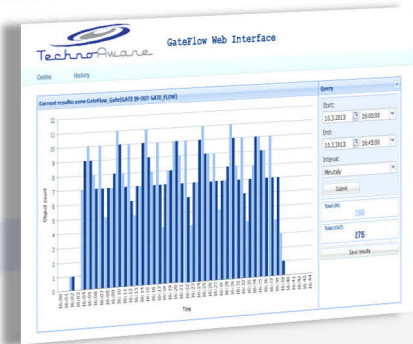
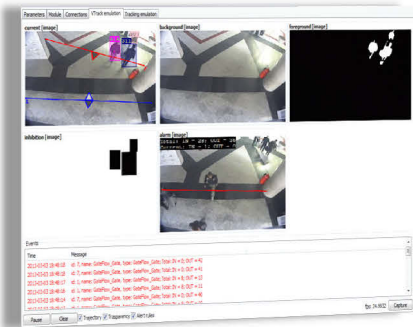
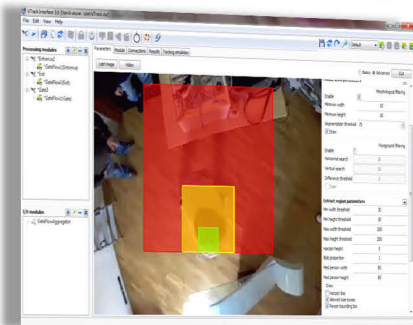
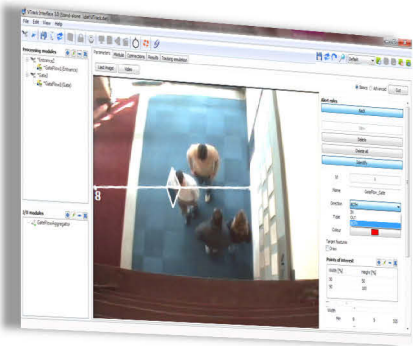
...through the estimation of the number of persons present inside areas with limited accessibility



- ◆ INDUSTRIAL AREAS AND CRITICAL INFRASTRUCTURES
- ◆ COMMERCIAL CENTRES, CHAIN STORE, SUPERMARKETS
- ◆ BANKS
- ◆ TRANSPORTATIONS: PORTS, AIRPORTS, RAILWAYS, ..
- ◆ PUBLIC FACILITIES: PUBLIC AND INSTITUTIONAL BUILDINGS, SCHOOLS, STADIUMS, PRISONS, HOSPITALS, LIBRARIES, THEATERS, MUSEUMS, PLACES OF WORSHIP, POST OFFICES, CASINOS
- ◆ URBAN AREAS
- ◆ RESIDENTIAL AND TOURISM FACILITIES

FUNCTIONAL SPECIFICATIONS

- ✓ Modular, scalable and flexible software architecture, available for Windows/Linux o.s. 32/64bit
- ✓ Unlimited configurable virtual gates, of any shape and size
- ✓ Mono or bi-directional counting for each configured virtual gate
- ✓ Detection and tracking of unlimited subjects of interest in the scene
- ✓ Robust and reliable in filtering false alarms due to atmospheric phenomena, changing of environmental conditions, vegetation, thanks to the most advanced self-adaptive algorithms based on Self Learning Background Modelling, Foreground Filtering and Multitarget Tracking
- ✓ Specific algorithms for filtering shadows and lighting changes
- ✓ Filtering of subjects of interest by size and dynamics
- ✓ 3D perspective management by linear interpolation on image, or by image calibration
- ✓ Unlimited configurable no-processing virtual zones, to inhibit not-of-interest areas in the image
- ✓ Unlimited configurable crops of the image, each one processed as separate video source
- ✓ Enabling/disabling of the module by external input or time scheduling
- ✓ Ability to process at resolution and frame rate different from the source ones
- ✓ Function GateFlowAggregator for the collection and management of the counting of several virtual gates configured on one or more cameras, with automatic and real time signaling of counting exceeding a certain configured threshold
- ✓ Web-based graphical and numerical visualization of the on-line and off-line counting data
- ✓ Manual or configurable reset for each configured counting function
- ✓ Scheduling and sending of automatic counting reports
- ✓ Export of counting data in csv format
- ✓ Interface for the simulation of the processing results, to verify the correctness of the configuration
- ✓ VTClient interface for the real time visualization of live and alarms, with bounding boxes and trajectories overlays
- ✓ Watchdog function, for the automatic restart of the module in case of critical error or hw unit restart
- ✓ Counting data sending according to specific communication/protocol requirements customizable by project
 - VMS or NVR compatible platforms
 - I/O contacts, electrical devices, external DVR or NVR units, through Modbus I/O devices
 - e-mail
 - FTP server
 - serial port, PLC
 - unit connected in web through http/TCP call, customizable
- ✓ VTrack-Recorder function, for the storage in local directories of continuous or event-based videos



TECHNICAL REQUIREMENTS

- Hardware unit needed, with Windows (XP or next) or Linux, 32/64 bit
- Video flow acquisition from:
 - IP cameras (optical or thermal), through standard protocols rtp/rtsp, mjpeg or ONVIF
 - analogue cameras (optical or thermal), by IP video encoders through standard protocols rtp/rtsp, mjpeg or ONVIF, or by compatible frame grabber cards
 - compatible VMS platforms
 - NVR or DVR units, compatible or through standard protocols rtp/rtsp, mjpeg or ONVIF
 - off-line videos in all standard formats (avi, asf, mpg, mov, ...)
- Conditions of the subjects of interest in the image in order to be effectively detected:
 - clearly visible to the naked eye in the image, even in difficult environmental conditions (night, heavy rain, fog, glare from the sun or other sources of artificial light, snow, ...)
 - entirely visible in the image for at least 10-15 continuous frames
 - minimum size: area of 100 pixels
 - maximum size: about 1/4 of the image
- Suggested camera set-up:
 - position: at least 3 meters height, the most possible vertical
 - lens: not longer than 2,8mm for camera positioned at 3 meters height
- Minimum frame rate: 8fps
- Suggested image resolution: CIF (352x288) or QVGA (320x240)
- Computational need:
 - CPU: up to 6 video flows in CIF/QVGA resolution at 8fps with single core 2.8GHz
 - RAM: about 100MB for each processed video flow

