TECHNOAWARE
TECHNOLOGIES FOR AMBIENT INTELLIGENCE

VTrack-SlipFall 5.0

Detection and notification of a person falling and remaining on the ground for longer than a defined time

Hospital Safety

Elder Protection

Office Injuries

Occupational Accidents

TECHNICAL SPECIFICATIONS

System architecture

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

Acquisition sources:
- IP cameras (optical or thermal), compatible* or acquirable through standard protocols rtp/rtsp, mjpeg or ONVIF
- analogue cameras (optical or thermal) through IP video encoders or hybrid DVR/NVR, compatible* with protocols rtp/rtsp, mjpeg or ONVIF
- compatible* VMS/DVR/NVR platforms
- off-line videos in all standard formats (avi, asf, mpg, mov, …)
- single images, in jpeg format
- USB or integrated web cams
- Intel depth-cameras
- thermographic sensors, trough Genicam protocol

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

Real time or off-line data fruition (events, counting, plates, other data) by:
- Vtrack WebInterface
- cgi call, for receiving automatically an xml file through http with the required data
- compatible VMS, data management, business intelligence platforms
- automatic periodical report in pdf format, customizable by project

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

Ability to stream out, by rtsp protocol, the real time processed video flow with the overlays of target's bounding boxes and trajectories for being acquired by compatible third-party platform

PrivacyBlur function, for the streaming of the video flow with the detected targets blurred in accordance with the privacy law

TechnoAware-CentralManager Client

- centralized configuration of unlimited local and/or remote VTrack modules
- automatic detection of all VTrack servers connected in the same sub-network
- centralized real time live view of the connected local and/or remote VTrack modules
- centralized real time visualization and management of the alarms, notified by unlimited connected local and/or remote VTrack modules
- real time or off line simulation of the processing results, to verify the correctness of the configuration
- visualization of the bounding box and trajectories of the detected targets, either in the live view and in the alarms panel
- real time visualization of the detected targets trajectories on a calibrated map
- recording and storing in local directories of continuous or event-based video clips
- recording of video clips showing targets tracked along multiple cameras
- centralized configuration of different user levels, allowing or inhibiting for each one of them the access to specific areas of the module
- ability to generate reports of the alarm events occurred in a defined timeframe, in PDF format

Video Analysis engine features

- Integrating the most advanced self-adaptive algorithms, based on Self Learning Background Modeling and Multi-target Tracking, for the most robust and reliable performances with any environmental conditions (atmospheric phenomena, vegetation, changing of lights, …)
- Deep Learning-based detection and classification of vehicles and persons in the scene
- Gradients-based algorithms for contour extraction
- Detection and tracking of unlimited targets in the scene
- Morphological Filter, for improving the effectiveness of the detection and / or separation of objectives by automatically enhancing their shape
- Foreground Filter, for the image stabilization (e.g. in case of camera swinging due to strong wind) and for the limitation of local heavily dynamic background (e.g. dense vegetation, heavy rain, clouds, …), globally or selectively on specific configurable areas of the image

Video Analysis engine features (cont.)

- Specific algorithms for filtering shadows and light changes
- Adaptive pre-filtering for the limitation of heavy noise
- Adaptive gamma-correction algorithms for the enhancement of the image contrast
- Automatic dynamic adjustment of the contrast sensitiveness, according to the environmental changes
- 3D perspective management, by linear interpolation on image, or by image calibration
- Ability to configure different perspective plans according to the morphology of the scene

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 active zones, of any shape and size
- Ability to crop and process independently unlimited image portions of the acquired video flow
- 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
- For each configured active zone, ability to configure independent alarm notifications for:
o start of alarm condition
o end of alarm condition
- For each configured active zone, ability to configure an absence alarm notification in case of no alarm event occurred within a defined timeframe
- Unlimited configurable no-processing areas, to inhibit not-of-interest areas in the image
- Unlimited configurable no-initialization areas, to filter the targets initialized where no targets of interest are expected to appear
- Filtering of targets by size, area and dynamics
- For each configured active zone, ability to filter targets by size and/or color
- For each configured active zone, ability to select specific active points of the detected target
- VirtualAlertRule function, for the generation of alarms by correlating in AND within a certain time the occurring of multiple alarms configured on the same camera or on other cameras connected locally

Diagnostics

- Watchdog function, for the automatic restart of the module in case of critical error or eventual restart of the hardware unit
- HeartBeat function, for the 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 TechnoAware-CentralManager
- Tampering function, to trigger an alarm on detection of camera obscured, dazzled or moved for longer than a configured time
- QualityCam function, to trigger an alarm on the reduction of visibility of the camera (i.e. because of dirt)
- VideoLoss function, to trigger an alarm on the loss of the video flow communication to the module
- VTrack-Monitor Client, for the configuration of automatic notifications for misfunctioning events of the connected VTrack modules

Licensing

- Licensing per each video flow current configuration, according to the number of functions working in parallel, regardless of the specific function (unless for Special Packages)
- License bound to the processing server unit, not bound to the video stream device (camera, encoder, ...)
- No server licenses need, no added plug-in licenses needed
- Local or remote VTrack license management through TechnoAware-CentralManager client
- Full availability of failover license management

VTrack-WebInterface

- Real time visualization of the current data (counting, speed, occupancy, license plates, …) related to the specific configured function, numerical and graphical
- Interrogation and visualization of the stored data related to the specific configured function in a certain timeframe, numerical and graphical
- Ability to export of the stored data in csv format
- Ability to make a manual reset of the visualized counting data

TECHNICAL REQUIREMENTS

Image and video streaming requirements

- Conditions of the target in the image for maximizing the detection performances:
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 image for at least 10-15 continuous frames
o minimum size: area of 100 pixels, at the farthest point where the detection is required (i.e. 5x20 pixel for a person)
- Minimum frame rate: 10 fps
- Suggested image resolution: according with the target's minimum size requirement, as per above.

Processing unit's requirements (cont.)

- Processor type: AVX compatible
- Computational need:
o CPU: considering, as reference, a single core with 3,2GHz base speed
- up to 8 functions in parallel, processing video flows in QVGA resolution (320x240) at 10 frames/second
- up to 6 functions in parallel, processing video flows in CIF resolution (352x288) at 10 frames/second
- up to 3 functions in parallel processing video flows in VGA resolution (640x480) at 10 frames/second
- up to 2 functions in parallel processing video flows in 4CIF resolution (704x576) at 10 frames/second
- up to 2 functions in parallel processing video flows in 800x600 resolution at 8 frames/second
- up to 1 function processing video flows in FullHD (1080p) resolution (1920x1080) at 5 frames/second
o RAM: about 80MB for each function processed in parallel
o GPU (only in case of use of Deep-Learning-based modules):
NVIDIA CUDA compatible; RAM DDR5 or superior; 0,2GB GPU RAM for each video stream processed
- Supported OS: Windows 8 or later