VTrack: Video Analytics for automatic video-surveillance

Simone de Titta, Gianluca Gera
TechnoAware srl
Corso Buenos Aires 18, 16129, Genova (Italy)
{simone.de.titta}{gianluca.gera}@technoaware.com

Lucio Marcenaro
DIBE - University of Genova
Via Opera Pia 11, 16145, Genova (Italy)
mlucio@dibe.unige.it

Abstract

TechnoAware research and develops technologies and solutions for ambient intelligence. Established in 2003 TechnoAware was born from the experiences and competencies of the ISIP40 research group of the University of Genova. This research group is studying and implementing video analytics algorithms since 1985 and is considered nowadays one of the major actors in this field worldwide. Entirely made up by researchers and experts in the video analytics field, TechnoAware main principles are: proprietary technologies (highly customizable and modular solutions), scientific competencies (high quality level and performances), continuous research and technological innovation (cutting edge products).

1. Introduction

TechnoAware offers its solutions and competencies to producers, system integrators and for study and realization of specific projects. Since 2006 TechnoAware is a member of the “Distretto dei Sistemi Intelligenti Integrati” (SIIT) and is a co-founder of the SIIT-PMI Consortium. Since 2005 TechnoAware is in the list of the research laboratories of the Italian Ministry of the University and Research. In 2005 TechnoAware realized together with the Department of Biophysical and Electronic Engineering of the University of Genova the permanent research agreement for a joint lab “Ambient Awareness Lab” (A2Lab), that is focused on the continuous increase of specific activities of education, research and technological transfer.

1.1. Awards

Quality and innovation of the VTrack technology was recognized and awarded at a national and international level:

- Perotto Prize (1st place), as the best informatics realization with special mention of the AEIT (Genova - November 2004)

2. VTrack demo

During the demo different VTrack functionalities will be demonstrated on images from live cameras if possible of by using sufficiently complex pre-recorded videos. The following functionalities will be considered.

2.1. VTrack intrusion

VTrack-Intrusion module (Fig. 1) is able to automatically detect objects inside pre-configured areas or trespassing virtual gates. The module is based on state-of-the-art video-analytics algorithms and it is able to filter false alarms that are due to environmental events (such as illumination changes, rain, wind, etc.) that are automatically filtered by the processing modules. Main features of this module are:

- Unlimited configurable virtual zones
- Objects classification based on shape and size
- Non-processing zones
- Virtual gate with directional alarms

Intrusion event is divided into two different types:

- Area Entrance: events are generated for tracked objects moving inside a configured virtual area on the image.
- TripWire: events are generated for tracked objects crossing a line or a virtual perimeter.

By modifying module configuration parameters it is possible to activate multiple heterogeneous events in the same field of view by adding unlimited virtual areas or gates.
2.2. VTrack people counter

**VTrack-PeopleCounter** module (Fig. 2) is able to estimate the number of people trespassing a virtual gate or staying inside a specific zone of the image. Main features of the module are:

- Unlimited configurable virtual zones
- Objects classification based on shape and size
- Detection of gates crossing directions
- Web interface for on-line and off-line people counter statistical data retrieval
- Programmable or manual counter reset

People counting events are subdivided into two different main functionalities:

- **GateFlow**: counting of moving objects crossing virtual gates
- **AreaCounting**: counting of people inside a specific area in the guarded scene

By using a specific web page (Fig. 3) it is possible to see the counted number of people in real-time or retrieving historical data though a simple query interface.

2.3. VTrack traffic management

**VTrack-TrafficManagement** module (Fig. 4) functionalities are specifically designed for traffic management. Main features of this module are:

- Unlimited configurable virtual zones and gates
- Objects classification based on shape and size
- Detection of gates crossing directions
- Web interface for on-line and off-line vehicle speed estimation and counter statistical data retrieval
- Programmable or manual reset for each counting function

**VTrack TrafficManagement** plugin is subdivided into four main submodules:

- **Vehicle Counting**: it is able to count vehicles crossing each configured virtual gate
- **Average Speed**: this submodule can be used for estimating average traffic speed
- **Stationary Vehicle**: by using this feature it is possible to detect stopped objects inside a pre-configured area of interest
Wrong Way detection: the system can generate alarms if a vehicle moving in an unallowed direction is detected.

3. Contacts

TechnoAware s.r.l.
Corso Buenos Aires 18/11
16129 Genova (Italy)
Ph. +39 010 5539239
Fax +39 010 5539140
E-mail: info@technoaware.com
Web: http://www.technoaware.com