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About ACIC

- ACIC is a Belgian spin-off from MULTITEL research centre (2003) (R&D started before 2000 at UCL University)

- ACIC is **Provider of High-Quality Video Content Analysis.**

- ACIC VCA software addresses various market segments:
  - Security/Safety (sensitive sites, public sites, ...)
  - Traffic Monitoring (road, tunnels, crossroads...)
  - People Counting (shops, shopping centres, ...)
Why ACIC? Unique Selling Points

- High performance (FAR/DR)
- Large set of analytics functions
- Customizable and open products
- High quality support to integrators
- Contractual commitment to a performance level
- Proven track records.
ACIC references track record
Our offer

Software package

Rugged system up to 4 IP or analogue streams

PC server up to 64 IP video streams
3 Main Software distributions

MvActivityDetection
- Sterile zone
- Virtual line crossing
- Perimeter protection
- Very Low false alarms!

MvTraffic
- Automatic Incident Detection (AID)
  - Traffic statistics
  - Integrated with VMS

MvPeopleCounting
- Directional people counting
- Counting groups
- Distributed counting
- 95% accuracy in proper conditions

High Performance VCA
Domain specific products

- PanoramaDetection for long range surveillance
- BoatDetection for canal lock surveillance
- PlaneDetection for airport taxiway surveillance
- BicycleCounting
- WrongwayDetection for exit door surveillance

...
Tight integration with Video Management Systems

Milestone XProtect

Copyright 2012
Tight integration with Video Management Systems

Genetec Omnicast

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Tight integration with Video Management Systems

Exacq Vision
Collaborative research projects

- ACIC have contributed to several European or regional research projects:
  - WCAM: wireless camera surveillance
  - TraceThem: multi-sensor object localisation
  - Translogistic: video analytics for the supply chain
  - Apidis: autonomous data collection for sports events and surveillance
  - Agirvit: stereo and laser assisted object detection
  - ...
Current research project: SecureWMS

- Warehouse Management System for enhanced security and traceability

- We use video analytics for
  - Global positioning of mobiles and objects
  - Detection of retrieval and deposit of goods
  - Loading/unloading verification
  - Trailer identification
Current research project: SV3D

- Security platform with 3D navigation in large and complex environments

- We use video analytics for
  - Robust person tracking and positioning
  - PTZ autonomous tracking
Current research project: Locotrac

- Road-rail Level Crossing surveillance

- We use video analytics for
  - Detecting vehicles, persons and objects on the railway
  - Laser and camera sensors fusion
From research to product: MvPanoramaDetection

How to detect distant objects over a large area in a cost effective way?
From research to product: MvPanoramaDetection

Use continuous sweeping thermal cameras over the area and perform video analytics on panoramic images
From research to product: MvPanoramaDetection

Off-the-shelf components integrated in a complete solution

Thermal camera + positioning unit

Analog/IP video

Command and control for camera and positioning unit

Setup & Alarm management
From research to product: MvPanoramaDetection

**Camera view**

**Composed panorama**

**Object segmentation, classification and tracking**

**Background/Foreground extraction**
From research to product: MvPanoramaDetection

- We use pan/tilt positioning information to compose the panoramic image, but:
  - Images need to be **flat field corrected** (variations in the pixel-to-pixel sensitivity)
  - Images need to be **geometrically corrected** (distortions in the optical path)
  - Image and positional data must be **precisely synchronized**
  - **Field of view** of the camera must be precisely know

=> **Automatic calibration process**
From research to product: MvPanoramaDetection

- For example, find geometric distortions using feature extraction and matching over consecutive images
From research to product: MvPanoramaDetection

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From research to product: MvPanoramaDetection

- Knowing the camera calibration, current pan-tilt position and global system location (latitude, longitude) we compute world based target attributes (WSG84 position, real speed and direction, size...)
From research to product: MvPanoramaDetection

- ACIC PanoramaDetection
  - Dramatically reduce the number of surveillance cameras
  - Perform long range detection over large area
  - Support thermal imaging for all weather, day/night surveillance
From research to products: move to real contexts

- Understand the right problem with the customer, can the video content analysis be an answer?

- Test the algorithm with a lot of different contexts to estimate the real strength/weakness of the approach

- Use large video corpus with high level benchmarking (e.g. the iLids New Technology dataset)

- Keep the configuration/accessibility of the technology in mind

- Don’t focus too much on the algorithm speed, it’s easier to make good algorithms faster than bad algorithms better.
Perspectives

• Mixed technics used to solve more complex scenarios in difficult environments
  • Explicit foreground/background extraction
  • Learning model for object detection and classification
  • Clustering of spatiotemporal features
  • ...

• Sensors fusion

• Complex processing can now be embedded in the camera (and storage too), manufacturers provides SDK

• Video surveillance as a service, for on line or a posteriori analysis
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