Acic ®
Video Analytics

High performance Video Content Analysis

HAVSS 2012

C. Chaudy
Technical Director

Content

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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.
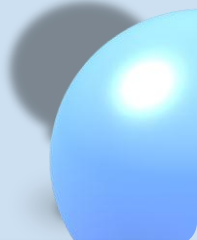
ACIC references track record
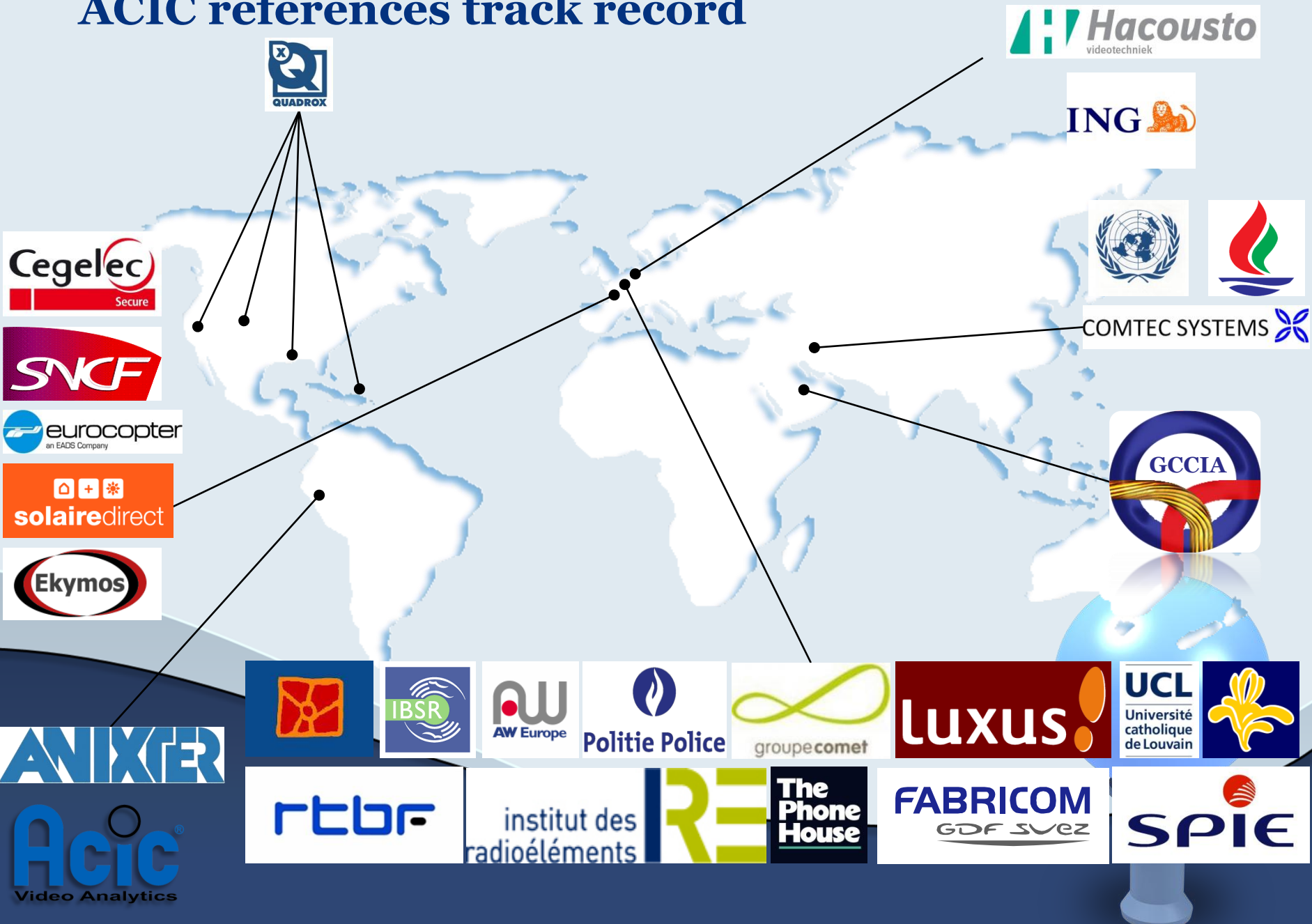
Our offer

Software package

Rugged system up to 4 IP or analogue streams

PC server up to 64 IP video streams

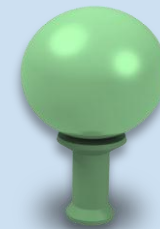# 3 Main Software distributions

MvActivityDetection

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

MvTraffic

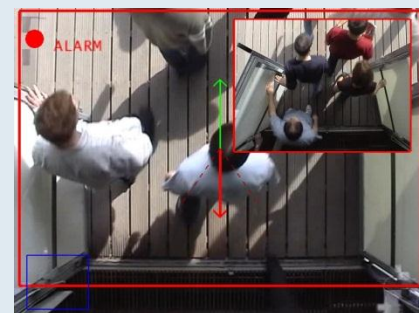Automatic Incident Detection (AID)
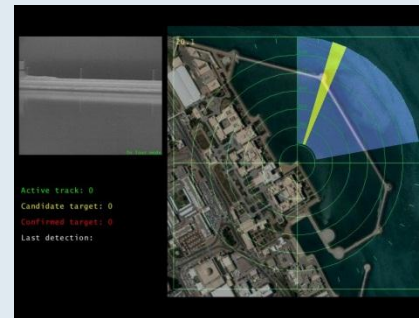- Traffic statistics
- Integrated with VMS

MvPeopleCounting

. Directionnal 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

Tight integration with Video Management Systems

Genetec Omnicast

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
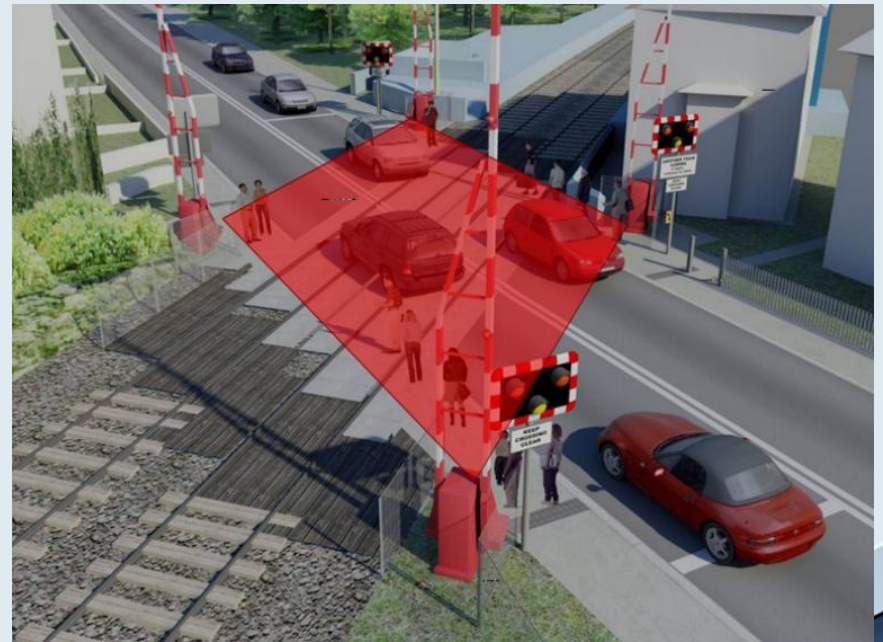
How to detect distant objects over a large area in a cost effective way ?

From research to product: MvPanoramaDetection

Use continuous sweeping thermal cameras over the area and perform video analytics on panoramic images

Fixed camera

ACIC Panoramic analytics
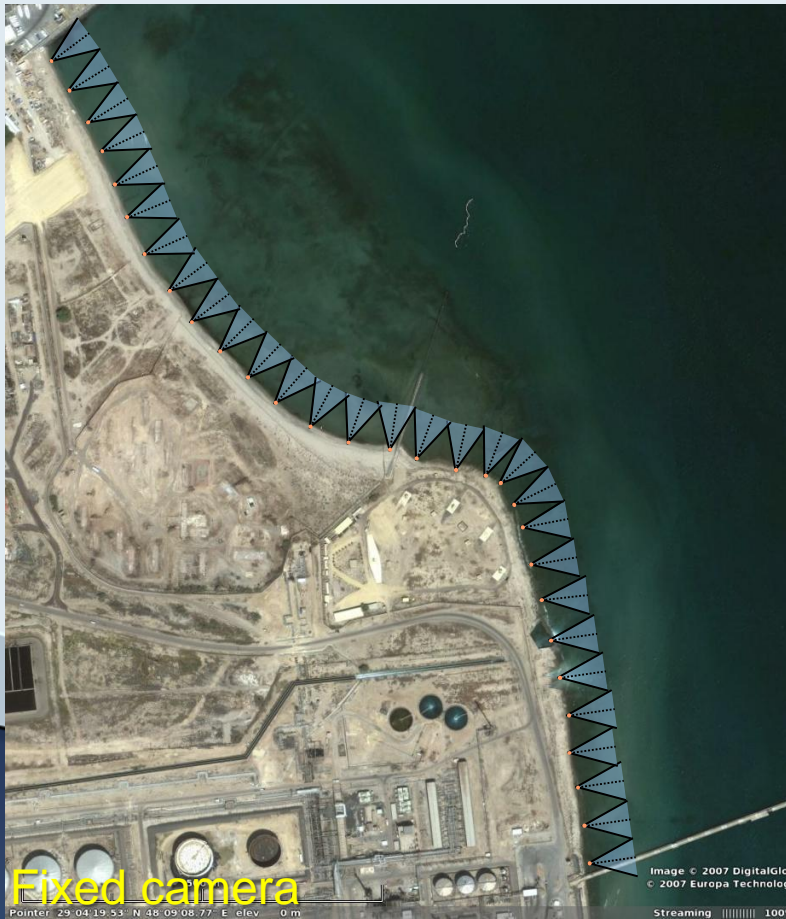
From research to product: MvPanoramaDetection

Off-the-shelf components integrated in a complete solution

Analog/IP video

Command and control for camera and positioning unit

Thermal camera + positioning unit
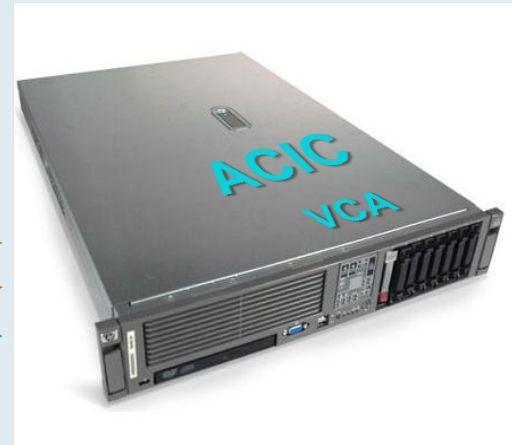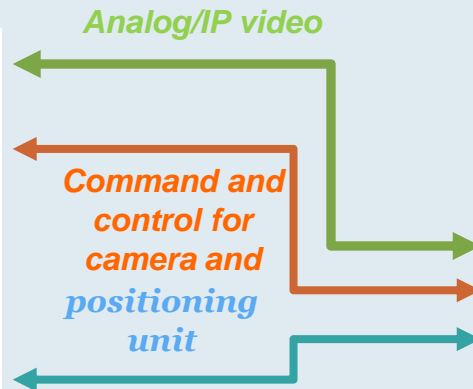
Setup & Alarm management

From research to product: MvPanoramaDetection

Camera view

Composed panorama

Object segmentation, classification and tracking
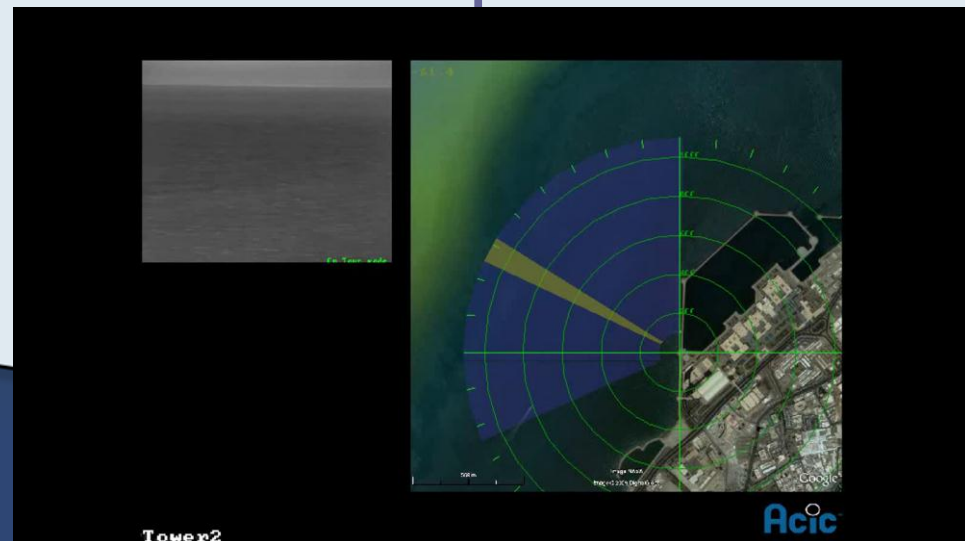
Background/Foreground extraction
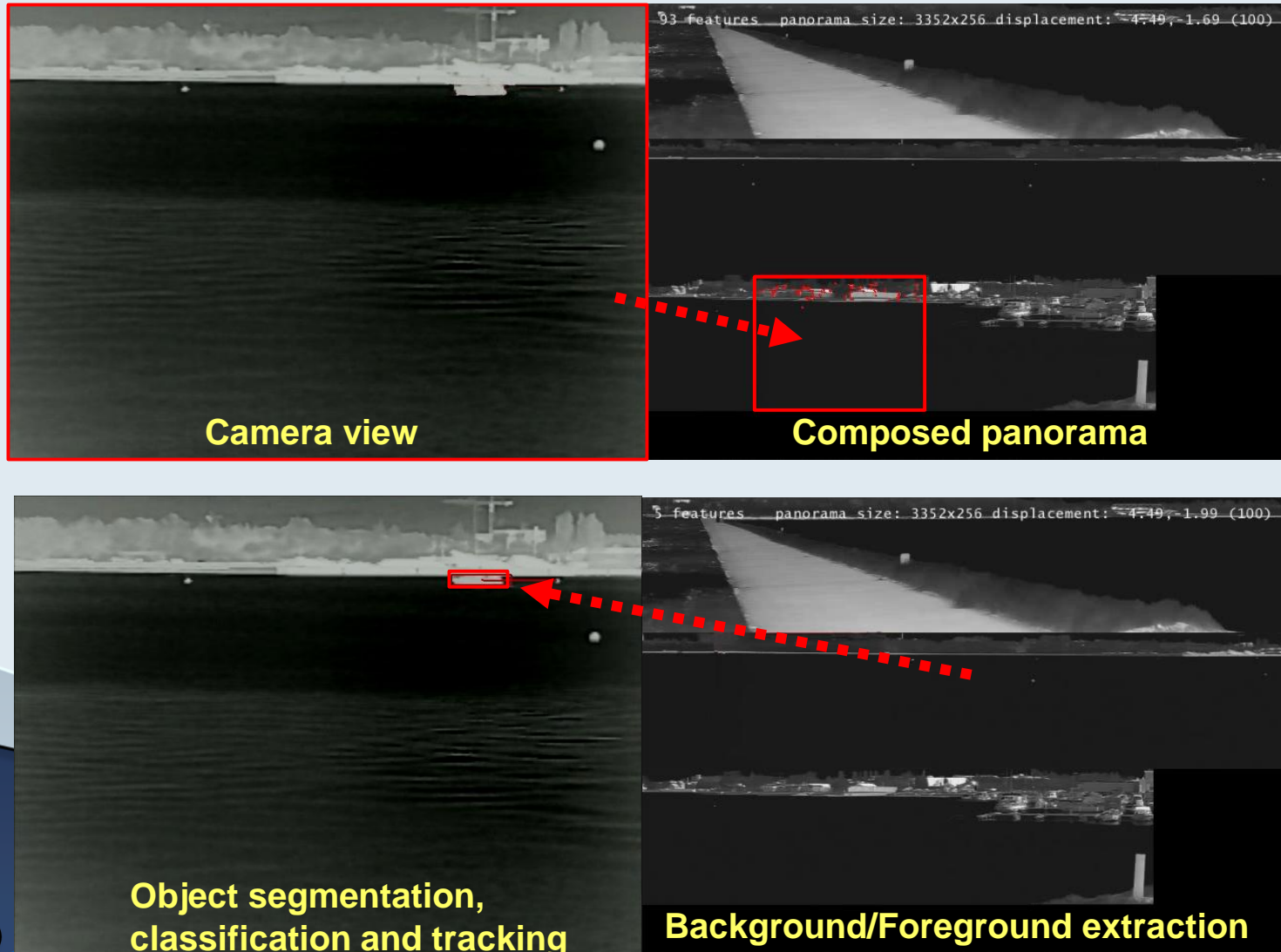
From research to product: MvPanoramaDetection

- 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
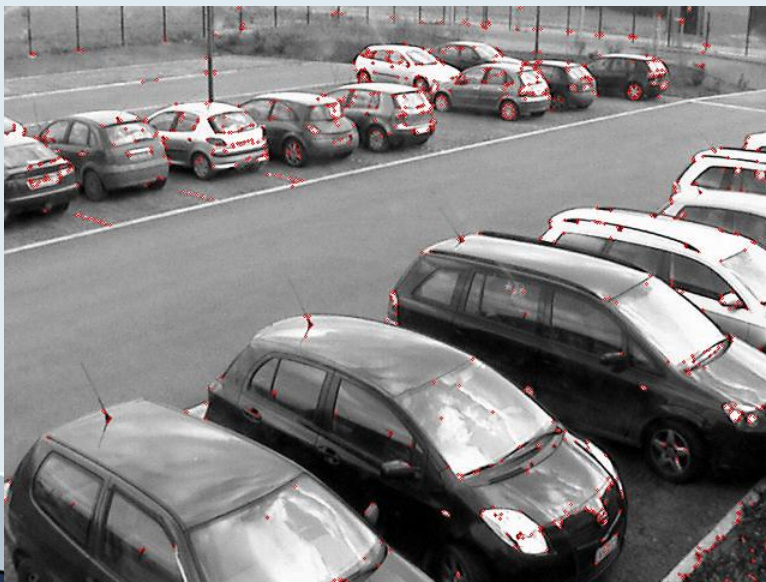
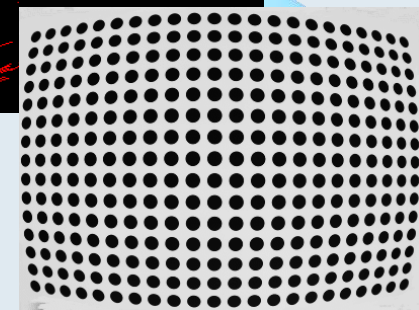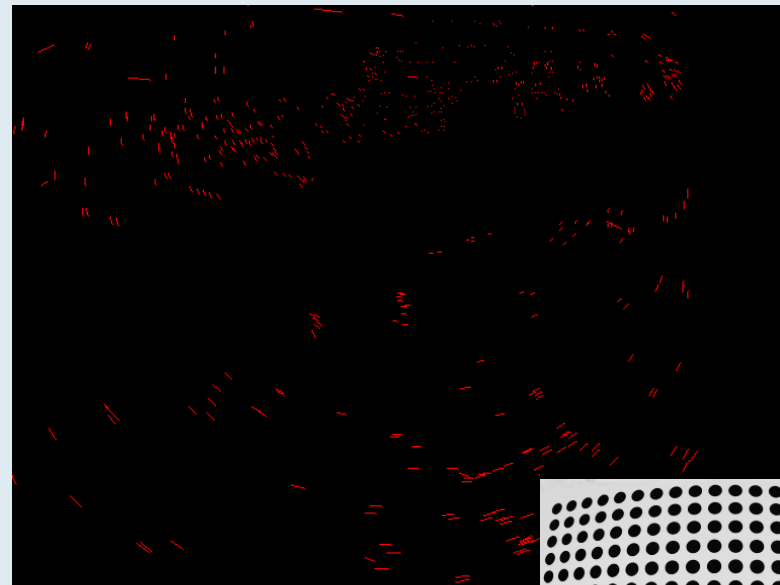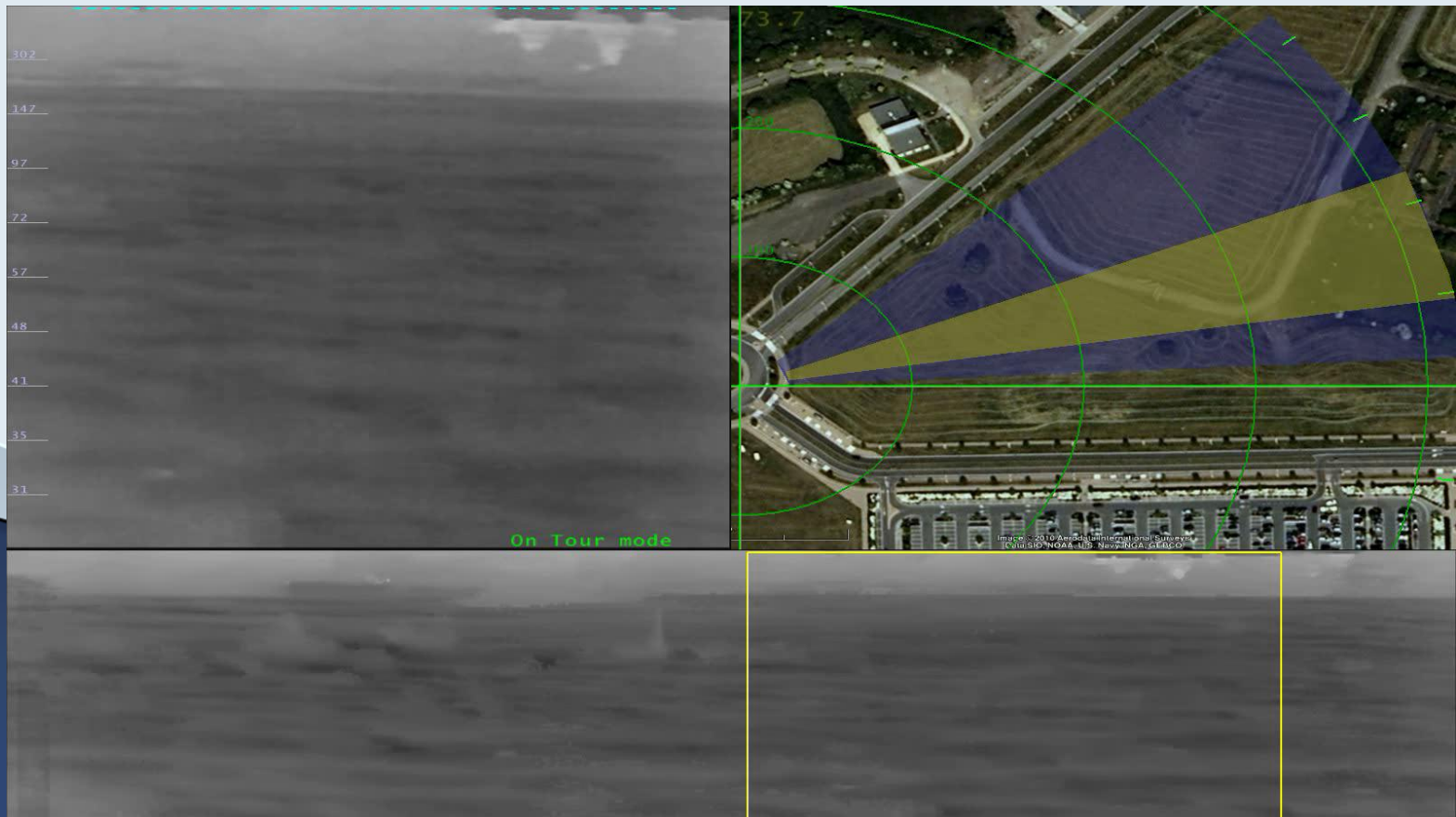# From research to product: MvPanoramaDetection

- For example, find geometric distortions using feature extraction and matching over consecutive images

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

200m

110°

ACIC
Video Analytics
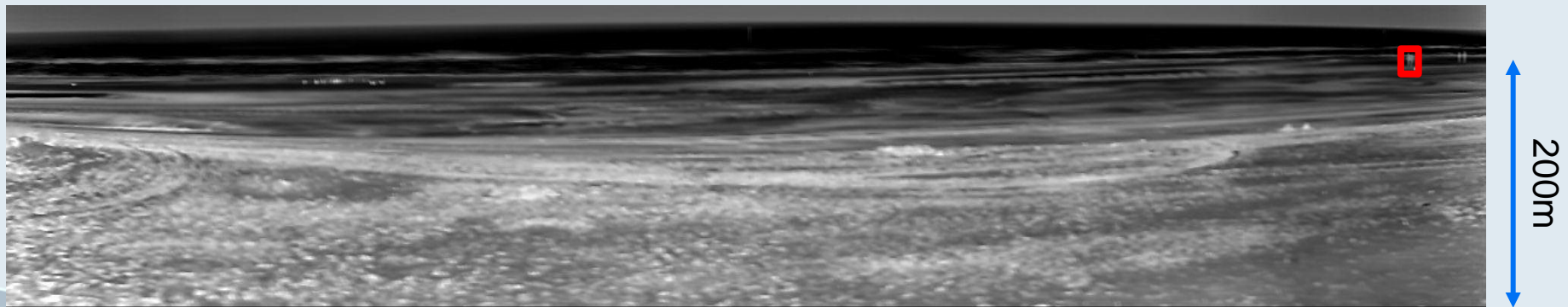
From research to products: move to real contexts

- 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

Feel free to contact us.

www.acic.eu
chaudy@acic.eu

28 Boulevard Inititalis
B-7000 Mons
Belgium

+32 (65) 394380

Questions?