

## **Image processing** Cooperation offer

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(Research organisation)



## What technology and/or application field can we address ?

### ▶ Video Surveillance

- Safety & Security issues
- Marketing statistics


### ▶ Multimedia

- Content-Based Image Retrieval (CBIR),
- Dedicated image/video processing

### ▶ Machine Vision

- Archives/records digitizing and analysis (data extraction)
- Automated inspection and control of objects or processes for
  - quality assurance, sorting, optical gauging, defect detection
- Material handling, robot guidance, etc.

## Expertise in technology transfer to industries (SME, etc.)

- Partnership through national/Europeans collaborative projects
- Development of image analysis software/prototype (industrial projects)
- Building of  company (spin-off) for video surveillance applications

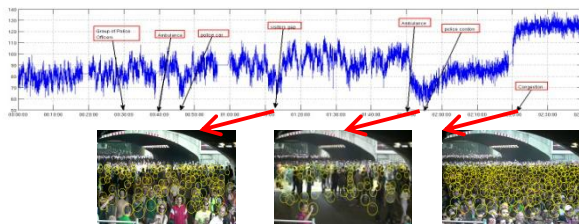
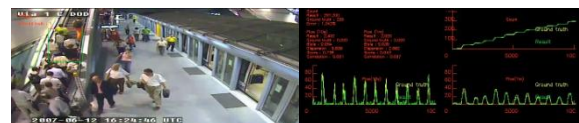


## Video Surveillance research topics

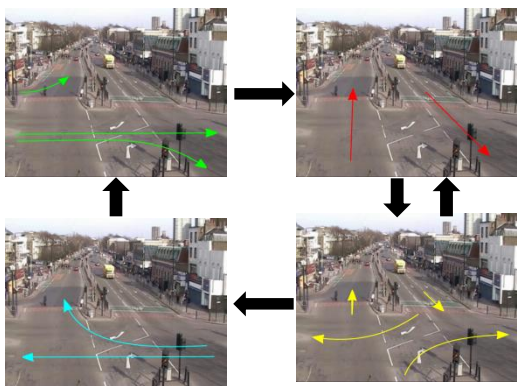
People counting  
Occupancy rate  
using standard CCTV

People flow in escalator

Occupancy rate of crowded areas



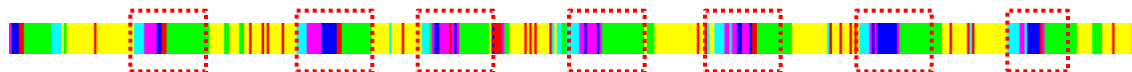
Activity discovery &  
anomaly detection



Models for selecting relevant video streams in control rooms

- ✓ Automatic discovery of normal activities
- ✓ Real-time recognition of normal activities
- ✓ Abnormal activities Anomalies detection

Cycle learned



Also interested in archives search, person re-identification, etc.



## Multimedia app. for SME

Automatic detection of corners in a document image



Processing chain development from scratch  
Performance evaluation metrics definition  
Optimised/Ported code under iOS

- ✓ Level 3: 90,98% & 1.3s.
- ✓ Level 2: 90,20% & 0.95s.
- ✓ Level 1: 87,45% & 0.8s.



Prototype for trademark image retrieval

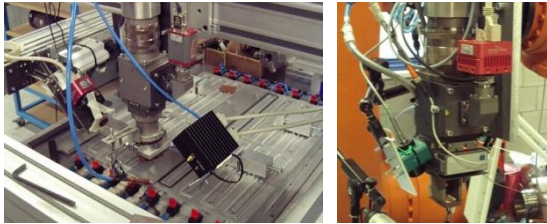
Reference scenarii creation  
Performance evaluation metrics definition  
Image retrieval module development and evaluation





## Machine Vision achievements

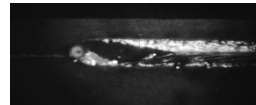
### Laser beam welding control and defect detection



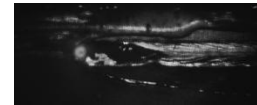
Method to detect /classify **defects** in **laser welding process**.

Image analysis for keyhole & melt pool characteristics extraction for

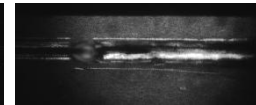
- ✓ start, end, normal (no defect), alignment, thickness and blister



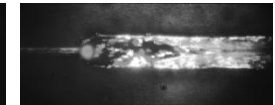
*normal*



*blister*



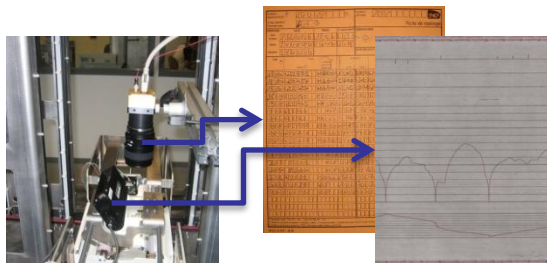
*thickness*



*alignment*

Evaluated using 20.000 images with recognition performance of 94%.

### Automated inspection of railway traffic recordings



Creation of a system for the automatic inspection of railway recordings

- ✓ Unwinding, **scanning of RS (Recording Strip)**
- ✓ **Extraction of speed, time and DE (Driving Events) from RS**
- ✓ Winding of band
- ✓ **Recto-verso scan of FC (Filling Card)**
- ✓ **OCR to extract FC data**

Evaluation on 15 RS, i.e. ~8000 km and 7000 DE (Driving Events)

- ✓ Detection of RS type → 100% detection rate
- ✓ DE extraction → MD of 0,28%, FA of 5,2 for 1000 km
- ✓ Stops extraction → MD of 1,2%, FA of 3,04 for 1000 km



## Contact details

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Visit <http://www.multitel.be/image/>

for more information

