EUCISE 2020
Industry Day
Brussels – 23.Sept.2015

Pierluigi Ritrovato

A.I. Tech

Artificial **I**ntelligence **Tech**nologies and Solutions

A spin-off company of the University of Salerno

The Vision of the Future. Now.

A.I. Tech
Company profile

A.I. Tech designs and develops intelligent audio and video analysis systems; **We help operators to identify and give a meaning to image provided by a surveillance system**

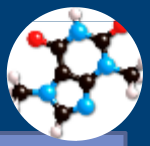
A.I. Tech was born in 2010 as a spin-off company of the University of Salerno, Italy, as the result of the activities of MIVIA lab

MIVIA lab is active from more than twenty years in the international research in the fields of multimedia signals interpretation, artificial intelligence and artificial vision

A.I. Tech

Expertise Areas

Video analysis for Behaviour Interpretation



Structural Pattern Recognition: graph matching

Audio analysis for Event Detection

Semantic Techonologies for Video Analytics

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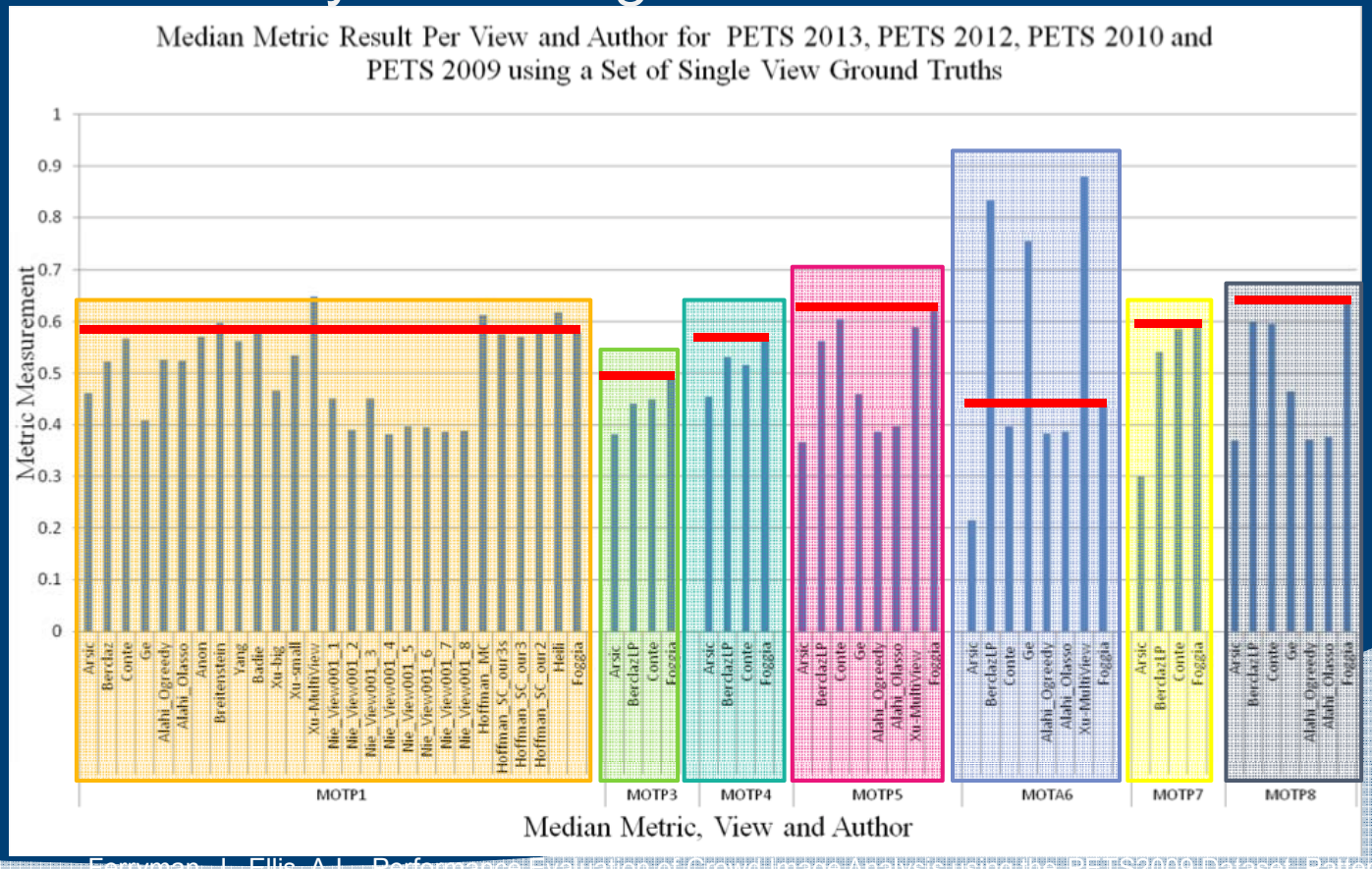
Expertise Areas

- A.I. Tech solutions are based on some of the best performing algorithms in the research community
  - VF2 (by Vento and Foggia) is one of the most efficient algorithm for graph matching
    - Reference paper with more than 500 citations on google scholar.
    - Applied in several application fields: Social Network Analysis, Semantic Web, Search, Behaviour Analysis, Bioinformatics

A.I. Tech
Expertise Areas

- A.I. Tech solutions are based on some of the best performing algorithms in the research community - Tracking



Ferryman, J., Ellis, A.L., Performance Evaluation of Crowd Image Analysis using the PETS2009 Dataset, Pattern Recognition Letters (2014), doi: http://dx.doi.org/10.1016/j.patrec.2014.01.005

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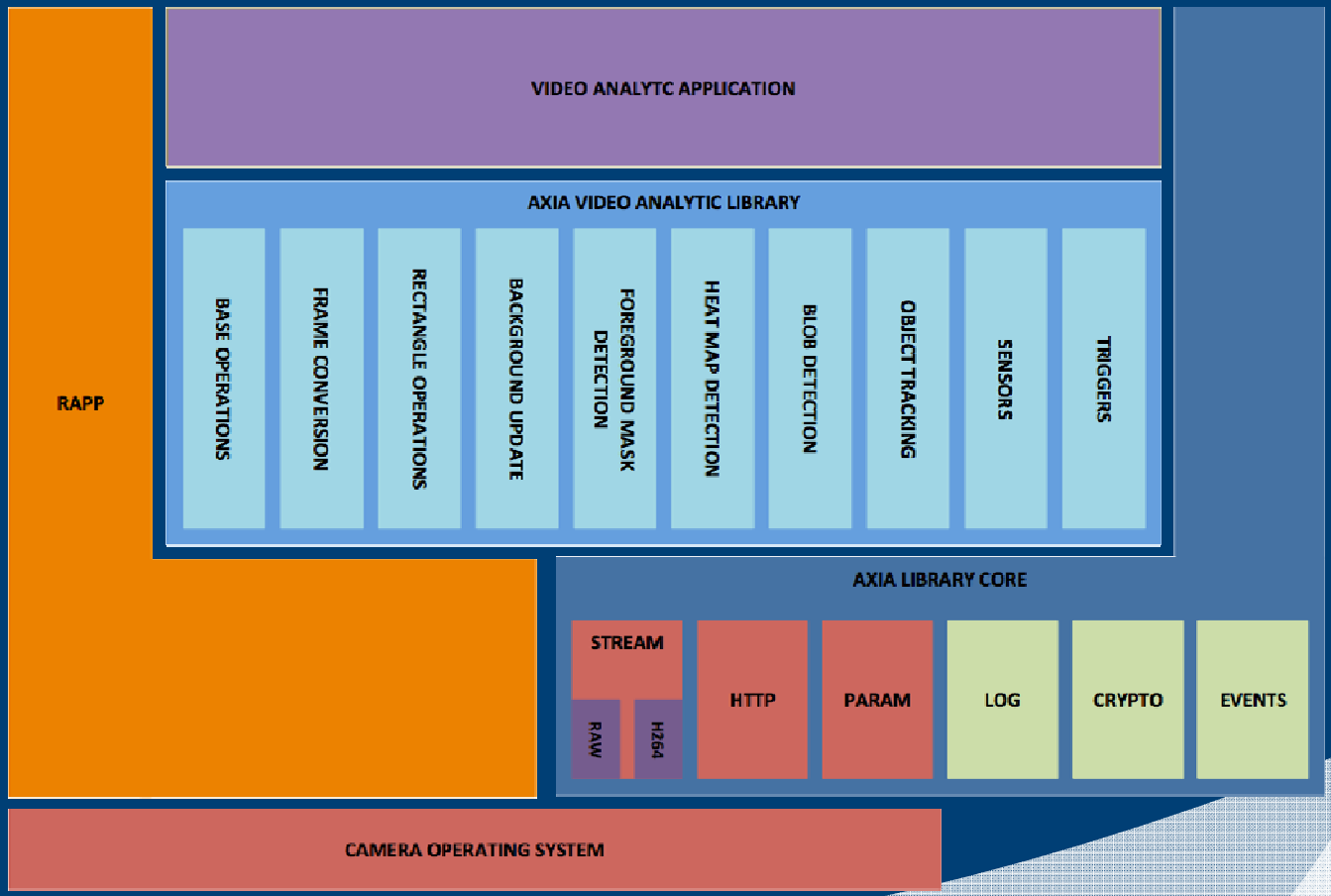
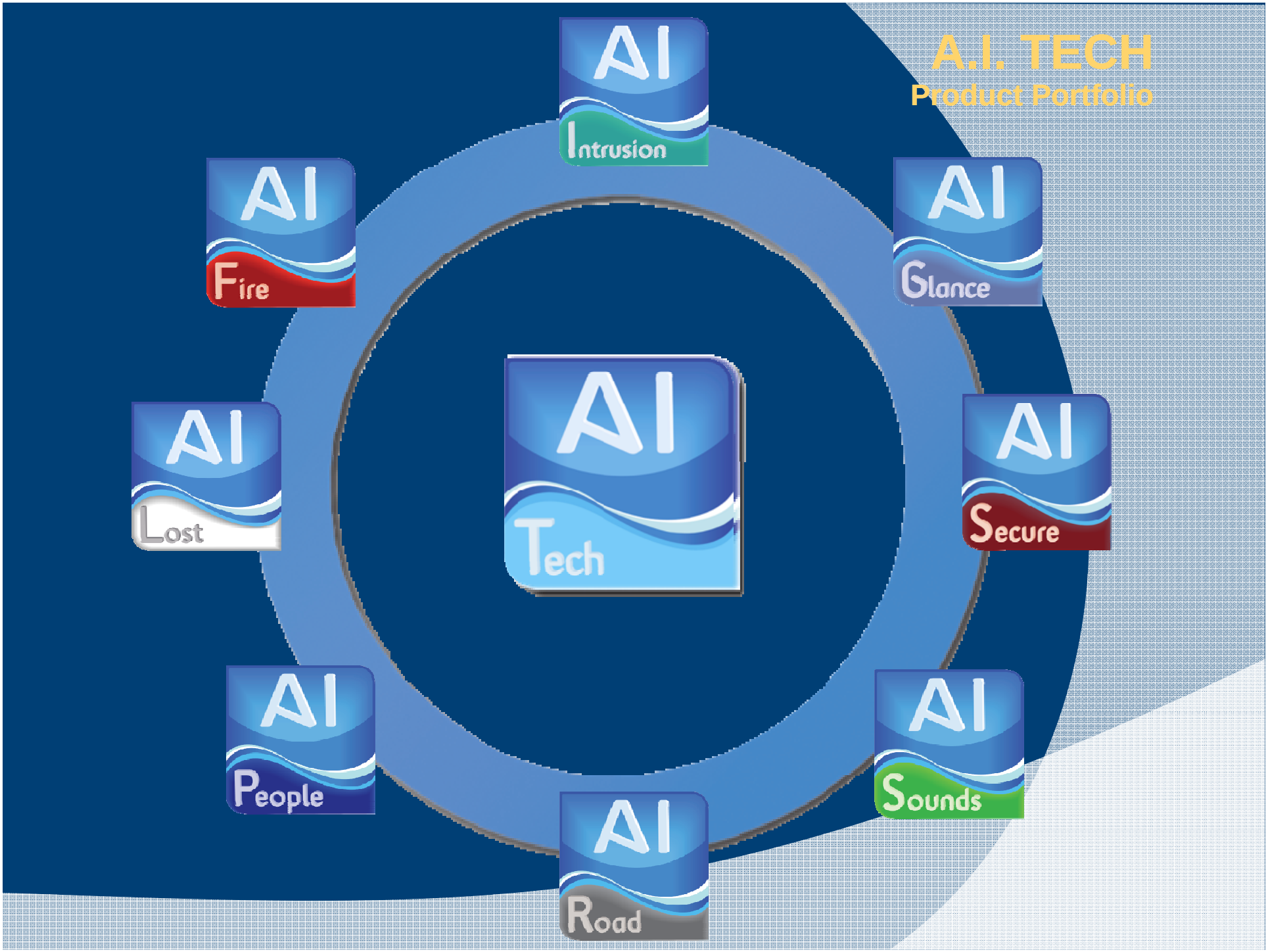
The technology

A.I. Tech makes available advanced video analytics algorithms over heterogeneous platforms both edge and server side

AXIS COMMUNICATIONS
HIKVISION
SAMSUNG TECHWIN
arteco
milestone
The Open Platform Company

A.I. TECH
SW FRAMEWORK

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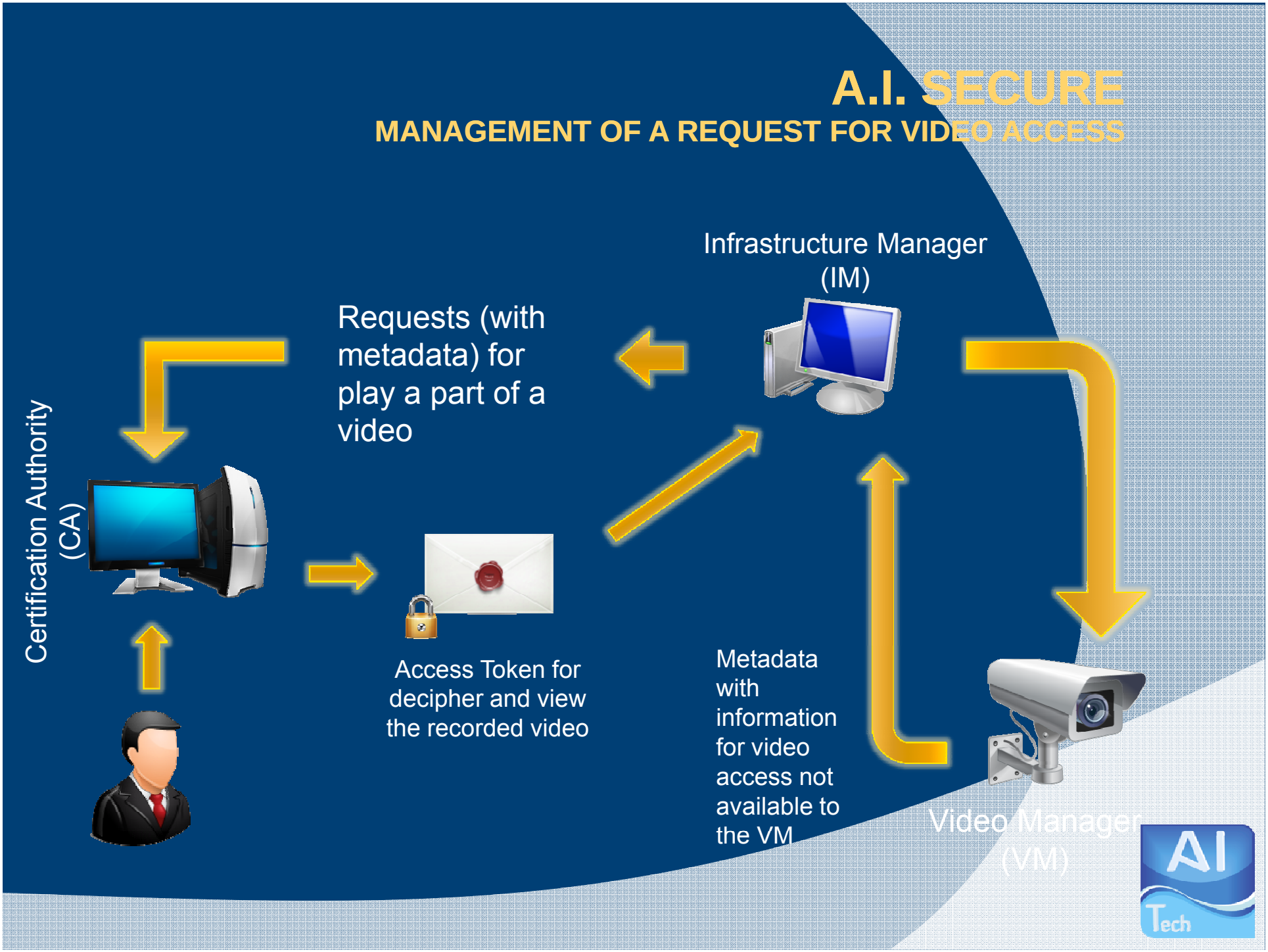
Product Portfolio
AI
Intrusion
AI
Fire
AI
Glance
AI
Lost
AI
Tech
AI
Secure
AI
People
AI
Sounds
AI
Road

A.I. SECURE

MANAGEMENT OF A REQUEST FOR VIDEO ACCESS



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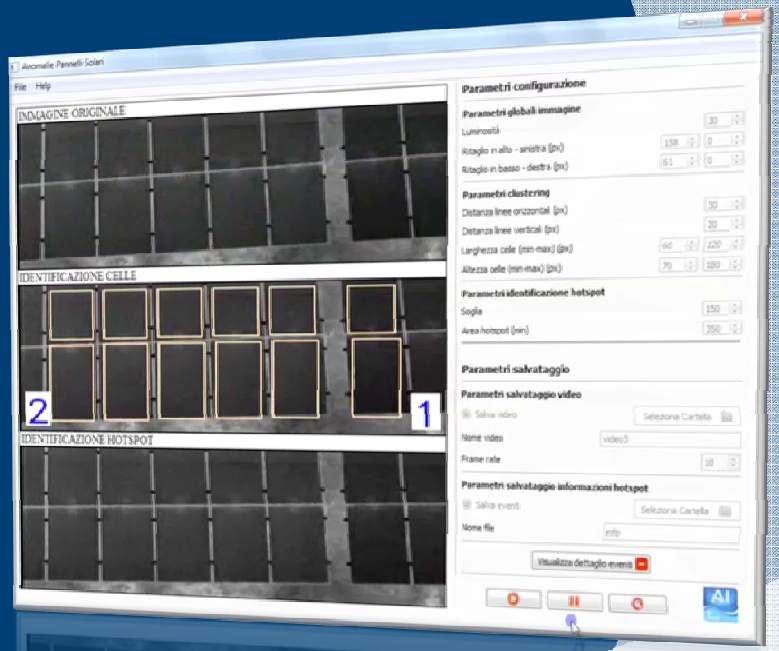
Customer Solutions: Maintenace of large photovoltaic Plants



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Semantic Technologies

- use of semantic web technologies for two different aspects …
  - Provide a fine representation of “situations” where traditional pattern matching or machine learning algorithms fails
    - Shadows according daily timing, background obstacles, background moving/floating objects (like tree, work in progress band, etc.), weather conditions (sunny, raining, etc.), …
  - Describe the context for
    - Driving detection algorithms
    - Collecting data (events) using a triple store to be queried via SPARQL
- … and implement a hybrid approach (integration of traditional bottom up with ontology based top down techniques) for improving object tracking and activity recognition in video analysis
- Aiming at
  - making existing video analysis solutions robust enough for operating in real case scenarios

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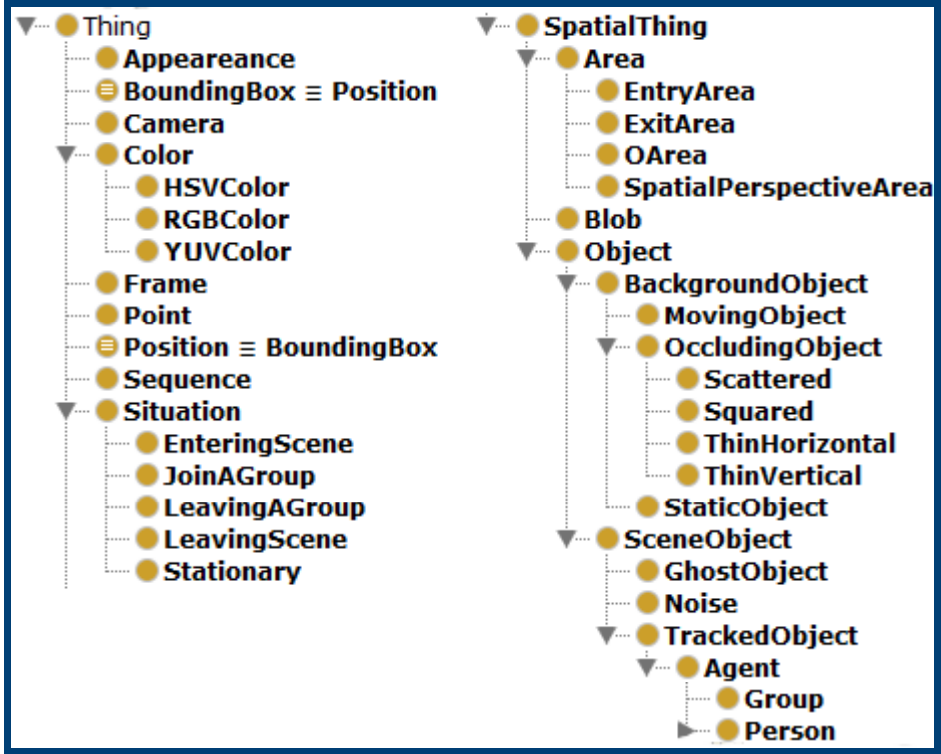
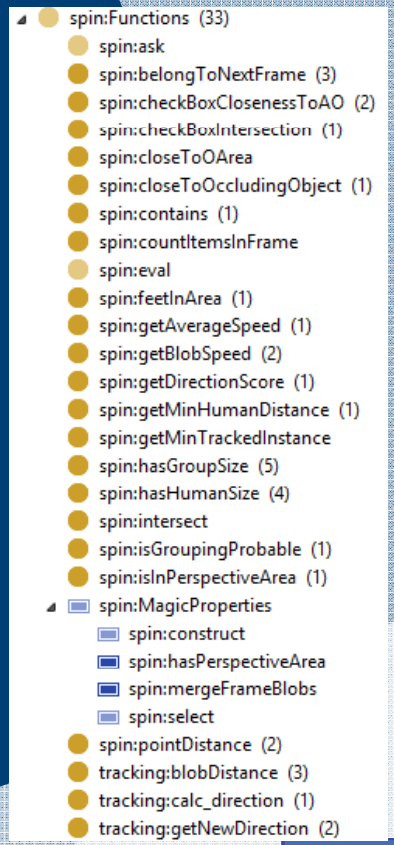
Semantic Technologies

MIVIA Ontology - Class



Properties and SPIN Functions



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Semantic Technologies

Example of big data analytics: Identify persons waiting in an area

Query Editor | Query Library

```
SELECT DISTINCT ?frame ?person ?xposition ?yposition
WHERE {
   ?person a foaf:Person .
   ?person tracking:blobMatch ?blob .
   ?blob tracking:belongTo ?frame .
   ?person tracking:hasAverageSpeed ?speed .
   FILTER (?speed = 0) .
#Ho filtrato tutte le persone ferme, quindi con velocità media nulla.
#Dopodiché individuo le coordinate per identificarne la posizione nel frame.
   ?blob tracking:hasBoundingBox ?bb .
   ?bb tracking:bottomLeftVertex ?bl .
   ?bl tracking:x ?xposition .
   ?bl tracking:y ?yposition .
FILTER ((?xposition>500) && (?xposition<800) && (?yposition>400) && (?yposition<600)) .
}
```

[frame]	person	xposition	yposition
tracking:Frame15	tracking:blob_ale_015_3_per...	712	403
tracking:Frame505	tracking:blob_ale_505_4_per...	719	575
tracking:Frame519	tracking:blob_ale_519_4_per...	724	452
tracking:Frame659	tracking:blob_ale_659_4_per...	702	418

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POSSIBLE CONTRIBUTIONS FOR PROJECT IDEA

- We can contribute on three different aspects:

1. innovative surveillance services development
   - We have research experience, knowledge and solutions for intelligent video analysis and video surveillance
   - Our technologies works on fixed and moving camera, on board and on server side
   - We are developing solutions for drone video surveillance
2. Use of Semantic Web technologies for
   - Harmonizing the data for facilitating sharing among systems
   - give a meaning to the data according to the different possible uses in the different areas
   - Support big data analytics
     - Enable new form of querying for extracting information and, most useful, KNOWLEDGE from data
3. Guarantee security of the system and secure transfer and access to contents

A.I. Tech
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