

CYBER & SECURITY SOLUTIONS

Ganimede

AI-BASED AUDIO AND VIDEO
ANALYSIS PLATFORM

 **LEONARDO**

ARTIFICIAL INTELLIGENCE AT THE SERVICE OF SECURITY AND OPERATION

Artificial intelligence is becoming an increasingly pervasive component in every field, transforming the way we analyze data, make decisions, and manage daily operations.

Applied to cameras, it transforms them from simple surveillance devices into true intelligent sensors capable of interpreting what happens in real time.

This makes possible to improve security, automating the detection of critical situations, reducing costs and resources, and giving value to technological investments made over time.

The information obtained becomes a concrete support for operational decisions in various sectors: from urban security to analytics, logistics, and smart cities.

MAKING SENSE OF LARGE AMOUNTS OF DATA

It is estimated that there are over 1 billion surveillance cameras installed worldwide and over 400 petabytes of video data are generated every day.

Most of these videos are never watched or played due to lack of time or resources.

As a result, many security threats could be detected early, preventing critical situations and incidents; contextual analysis could be used to improve services, productivity, and operations.

Artificial intelligence-based video surveillance allows the system to be used proactively to:

- Real-time identification and recognition of specific events, behaviors, and situations
- Post-processing of video recordings for investigation or statistical and predictive analysis

GANIMEDE, THE INTELLIGENT VIDEO AND AUDIO ANALYSIS

Ganimede is Leonardo's platform for large-scale analysis of live and recorded data streams based on Deep Learning.

It is built by leveraging Leonardo's extensive expertise in video analytics and IT platforms, combined with the cutting-edge capabilities of Leonardo's centers of expertise specializing in Artificial Intelligence, Machine Learning, and Deep Learning.

Ganymede is developed according to the security-by-design paradigms that Leonardo applies to all its systems and “security for AI” to protect AI systems from threats, attacks, or manipulation.

KEY FEATURES

Ganimede is characterized by innovation and application simplicity, thus representing an effective analysis and operational and decision-making support tool capable of increasing situational awareness and transforming event detection and data analysis from a complex and resource-intensive operation into an automated and efficient process.

The solution was designed and developed to be:

- Highly scalable,
- Capable of delivering high performance
- Applicable to diverse contexts and purposes
- To safeguard and empower technology investments
- Unique and applicable to all video surveillance systems (brand independent)

FLEXIBLE ARCHITECTURE

Ganimede's general architecture includes as main components

- The Server Core Components for AI-based audio/video analysis
- The Database Repository and Registry for Software Components
- The Administration and Smart Viewer Operator Interface Modules

Its architectural features allow Ganymede to be deployed on commercial servers with standard GPUs and include a set of algorithms trained on convolutional neural networks defined in Leonardo's AI laboratories.

Ganimede's key value is its native integration with Leonardo's Physical Security Information Management (PSIM) platform (SC2), with parameterization and algorithm application capabilities for configured cameras and audio/video sources, easily accessible from the PSIM.

Ganimede is also integrated with Leonardo's other Global Monitoring solutions and can interface with external systems via dedicated APIs, providing associated metadata (timestamps, events, identified objects).

PLUG & PLAY APPROACH

Ganimede is a web-based platform that provides:

- A configuration module that allows to select from the configured audio/video sources and apply one or more algorithms. For each applied algorithm, the area within the scene to which the analysis should be applied is defined in a very intuitive manner.
- The remaining parameters characterizing the individual algorithm are then tuned.
- Once the setup is complete, the algorithms can be activated and suspended as needed directly from the Smart Viewer operating interface.



ALGORITHMS

Ganymede includes a set of algorithms that can be categorized into:

OBJECT RECOGNITION AND CLASSIFICATION

- Object detection (people, vehicles, weapons, specific objects)
- Object tracking (over time)
- Face recognition / body recognition
- License plate recognition (LPR / ANPR)

BEHAVIORAL ANALYSIS

- Anomaly detection (intrusions, suspicious behavior, gatherings)
- Complex actions (fight, man down, loitering, abandoned objects)

QUANTITATIVE ANALYSIS

- People or vehicle counting
- Flow and density estimations
- Queue analysis

ENVIRONMENTAL ANALYSIS

- Smoke and fire detection
- Monitoring of sensitive or perimeter areas (intrusion detection)

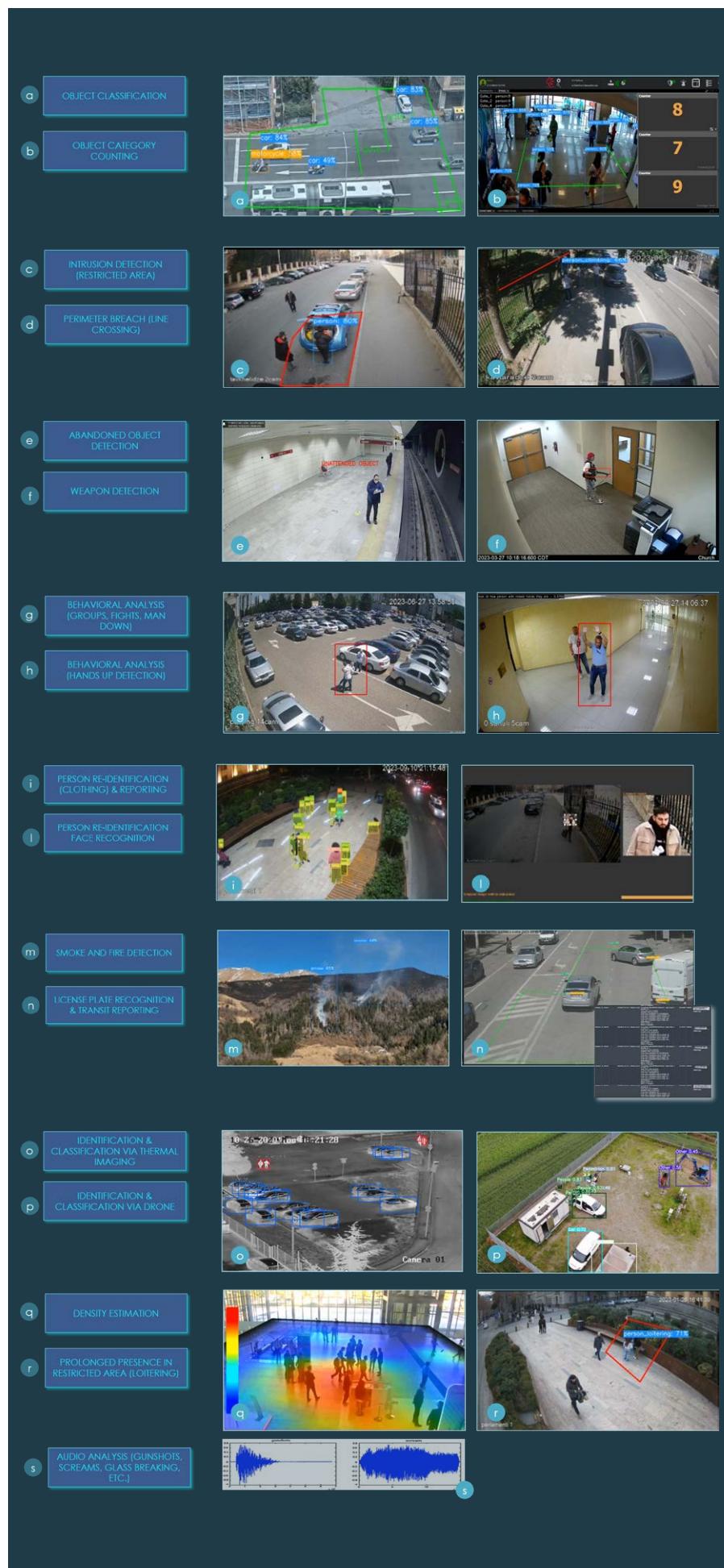
SOUND RECOGNITION AND CLASSIFICATION

- Gunshot / glass break detection
- Screaming

The identified algorithms are a subset of those potentially included in the platform.

One of the added values of the Leonardo solution is the ability to meet specific needs by implementing and testing AI-based multimedia analysis algorithms in our laboratories with high standards of reliability and security.

The implemented algorithms are also compliant with current regulations regarding privacy and use in specific contexts.



A STEP FORWARD IN SAFETY AND OPERATIONAL MANAGEMENT

PLUG & PLAY AI APPLICATION

- Enhance existing cameras and video streams by selecting the algorithms to apply

MULTI ANALYSIS ON A SINGLE STREAM

- Combined analysis with multiple algorithms executable on the same flow

SCALABLE OVER TIME

- Continuous addition of new algorithms developed and trained in Leonardo's AI Labs
- Proven performance on 10,000+ cameras with over 20 different algorithms and 99%+ required reliability

MORE THAN THE OTHERS

- Easier to use in daily operations
- One application for all brands and sources
- A central platform to ensure reliability and simplify configuration and maintenance
- Capability to perform retrospective analysis on existing video recordings

OUR GLOBAL MONITORING ECOSYSTEM DOES WHAT NO HUMAN CAN DO:

OUR EYES NEVER BLINK

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