



ATERMES : SURICATE

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ATERMES – Introduction

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ATERMES has been a preferred industrial partner for major defense contractors for over 35 years. Its expertise in "equipment and systems" allows it to offer high-performance and attractive solutions, from equipment design to their operational maintenance. Building on its recognized experience while maintaining its service activities, ATERMES is now a Mid-sized Enterprise by expanding its product line for export, specializing in tactical surveillance equipment while innovating with embedded AI and edge computing. Leveraging its innovative solution BARRIER™ and SURICATE among others, ATERMES aims to become a international strategic partner of defense and security players around the world by providing its cutting edge technology made for special harsh environment.





MONTIGNY LE BRETONNEUX

Headquarters, Engineering Center - 4500m²

- Research and development teams in Electronics, Mechanics, Optics, and Software
- Laboratories, design office, system architecture
- Prototype laboratory
- Cleanroom, anechoic chamber
- Vehicle integration and validation platform.



SALBRIS

Production center – 10 000m²

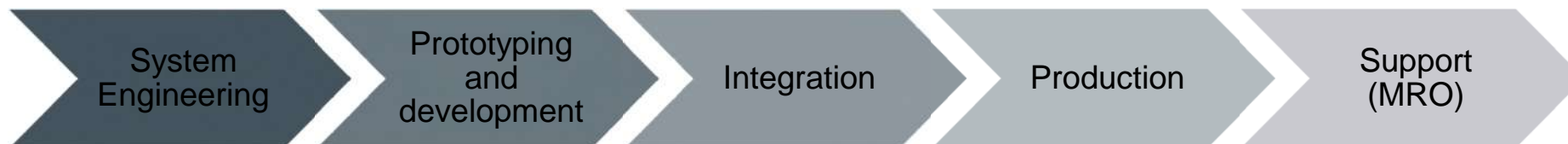
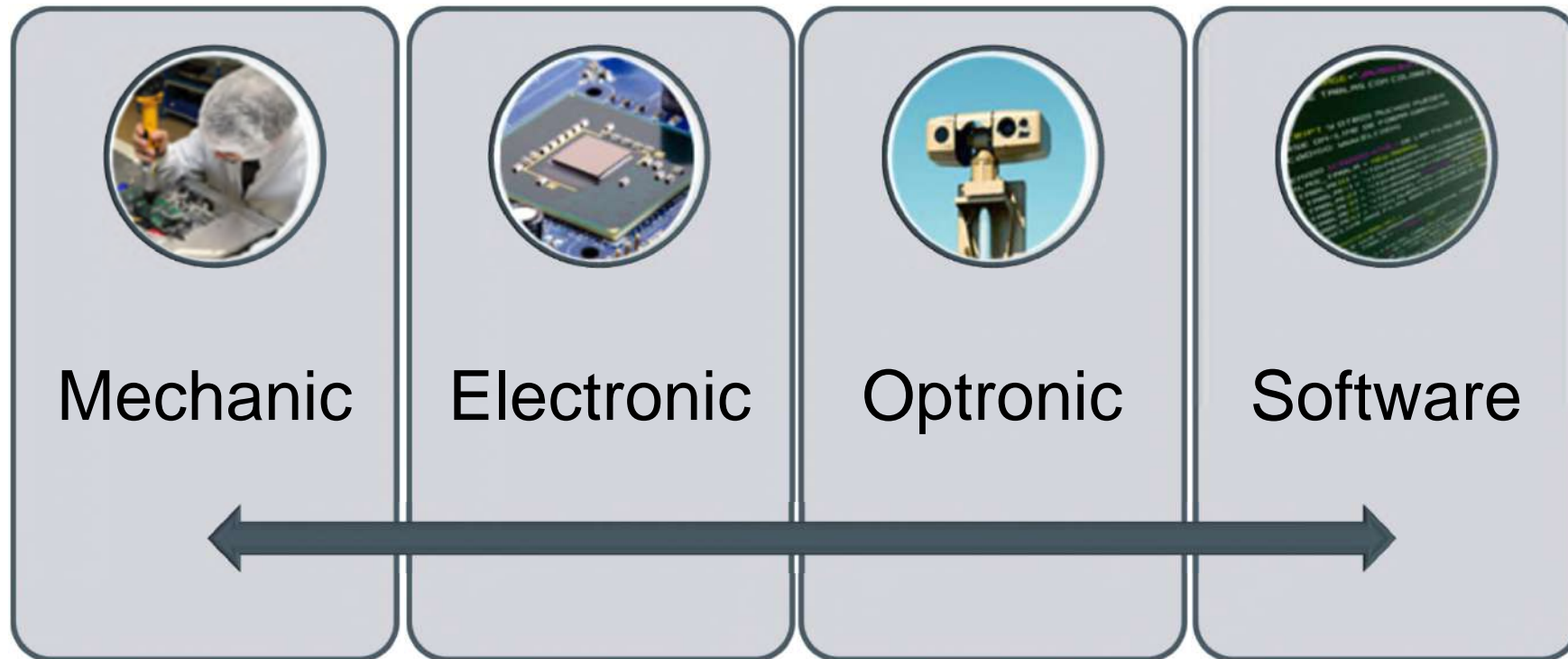
- Fully secured site
- Workshops and production lines
- Cleanrooms
- Testing equipment
- Radar and microwave competency center
- Validation, debug



ATERMES : Our Offering

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ATERMES : Some of Our Products

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BARRIER™ : Border Protection



ASOS : ATERMES Operational Surveillance Solution



ARTEMIS 2G Hardened Computer



A-TOM550 Automatic Laser Bird deterrent System for airports



ATLANTIS Ruggedized Intelligent Interface



NOCTUA Gyrostabilised Surveillance Head



ARADO Land Surveillance Doppler Radar





ATERMES : our services

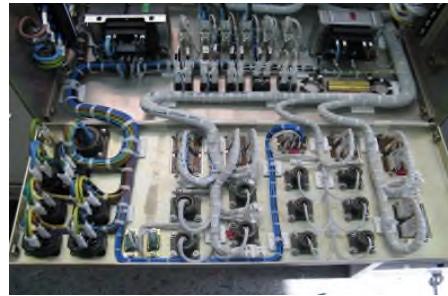
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Mechanical design office



Electronic Engineering



Software engineering



Maintenance, repair and operations



Customisation



On Site technical assistance



Production





ATERMES – FZ LLC

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To enhance our service in the Arab world, ATERMES has made the strategic decision to establish a commercial branch in the UAE, aimed at catering to the Middle East and North Africa region. The branch will be led by ATERMES President, Mr. Lionel Thomas, alongside Commercial Director, Mr. Walid Lahoud. This initiative will facilitate direct engagement with defense and security customers to address their current and future requirements. The incorporation process of the branch has been initiated and is expected to be operational within a month.

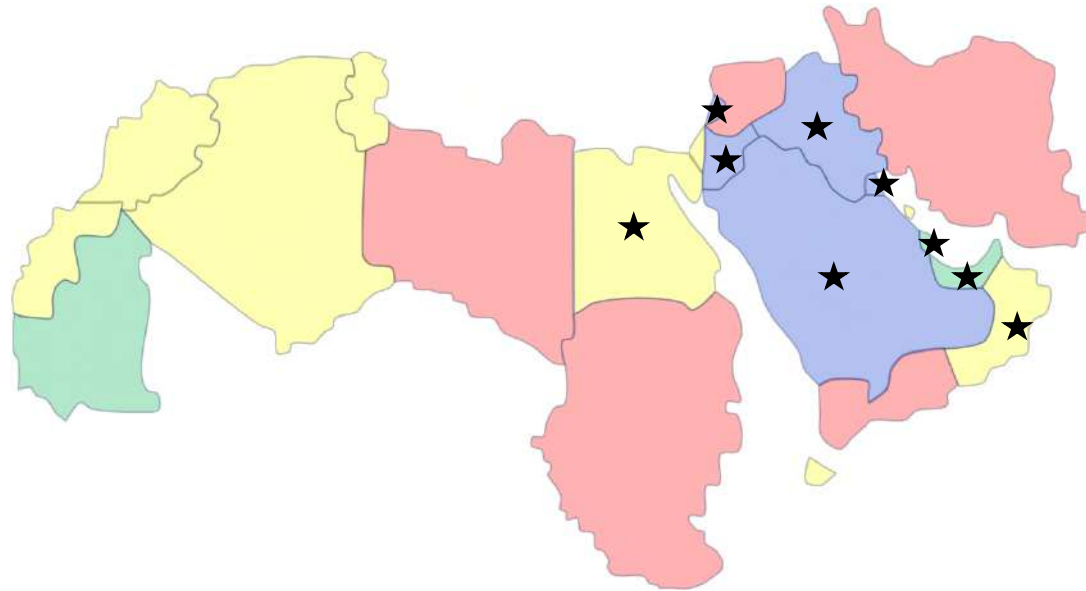
The branch will engage with different Value added resellers and local partners in order to better serve the local need





ATERMES – FZ LLC : Our Area

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- international Blockade
- Advanced Discussion
- Active sales research
- Starting discussion
- ★ Existing partner

ATERMES has strategically chosen to establish its branch in the UAE due to its pivotal position as a nexus for all trade within the MENA region. Recognized as an unparalleled platform for both global and MENA-specific commerce, the UAE offers unparalleled opportunities.

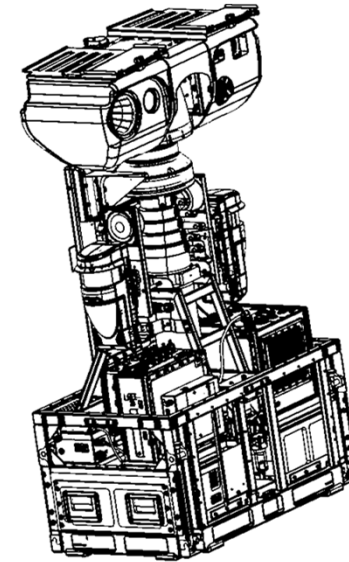
Our list of partners for each country is available soon on our website





ATERMES – SURICATE MR

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- Derived from BARRIER™, SURICATE MR integrates cutting-edge technology for efficient missions.
- Features include MWIR thermal camera, day camera, laser range finder, GPS, and integrated mission computer.
- Lightweight and compact design allows for easy vehicle integration.
- Equipped with cooled IR sensor, day vision sensor, BIVAN embedded computer, laser range finding, torch, and motorized pan and tilt platform.
- Versatile mounting options: watchtower or vehicle (e.g., Toyota Hilux, Nissan Navara, Ford Ranger).
- Detects human or vehicle intrusion and offers manual zoom for reconnaissance and identification.
- Operator can use range finder and inertial unit to locate threats on the map.
- Offers Visual DRI for manned operation and automatic detection for motion as small as 4 pixels.
- Can be controlled from vehicle control post or remotely from a situation room via high-data-rate radio link.





ATERMES – SURICATE LR

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- Traditional long-range surveillance combines costly RADAR and high-performance EO, but faces challenges in aiming and time-consuming scanning.
- ATERMES introduces the "Optronic scanning concept" using deep learning algorithms for instantaneous detection and classification.
- This all-in-one solution eliminates the need for costly RADAR and EO integration, providing efficient 360° panorama inspection within a minute.
- Operators can pinpoint threats accurately using the laser range finder and benefit from optimized scene preparation for rapid observation.
- The system's deep learning algorithm highlights scene details, aiding in threat identification.



- **MWIR thermal imager**
 - 3 μ m – 5 μ m
 - 500mm F/3
 - X14 optical zoom
 - 10 μ m sensor pitch
 - 1280 x 720 resolution
 - NETD <30mK
- **Day CMOS camera**
 - 600mm F/6,3
 - X3 optical zoom
 - 4,2 μ m sensor pitch
 - 9504 x 6336 resolution
- **Optional eye safe LRF**
 - 1,5 μ m
 - 0,35mrad divergence
- **Stabilized Pan & Tilt platform**
 - Nx360°
 - Pan & tilt rate 120°/s
 - Pan & tilt acceleration 150°/s²
 - 100 μ rad RMS stabilization
- **Embedded GPU computer**
 - 12 CPU @ 2,2GHz / 1 GPU @ 1,3GHz
 - 64Go DDR5 RAM
 - 275 Teraops/s





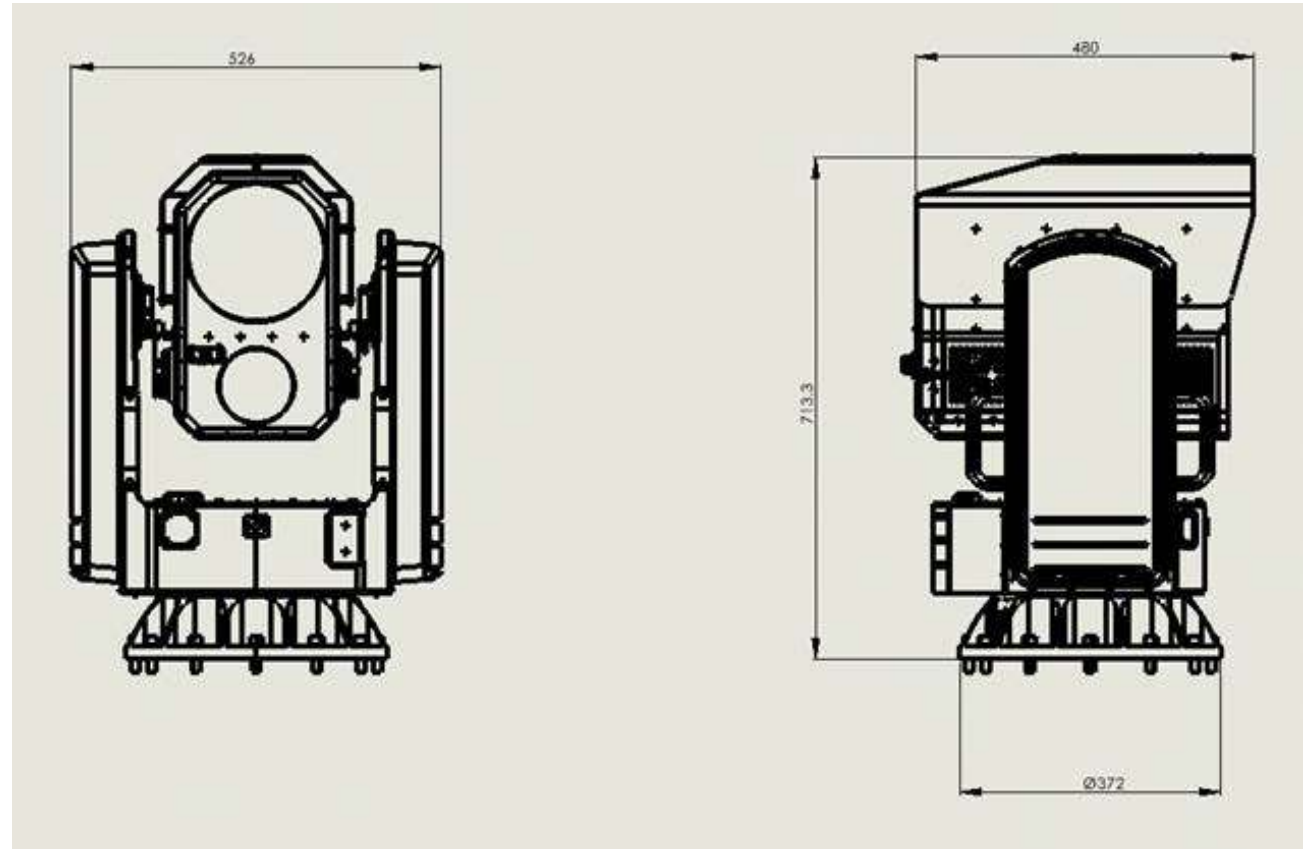
ATERMES – SURICATE Characteristics

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- Mechanical
 - Weight < 85kg
 - Size 480 x 526 x 714
 - Power 28VDC / < 80 W
- Environment
 - Operating -40°C + 65°C
 - Storage -46°C + 71°C
 - Vibration MIL-STD-810G
 - Shock MIL-STD-810G
 - Solar radiation MIL-STD-810G
 - Sealing IP67
- Interface
 - Giga Ethernet





ATERMES – Johnson criteria (DRI)

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The Johnson Criteria, proposed by John Johnson in 1965, provides a guideline for the minimum detectable signal in a communication system.

It helps determine the signal-to-noise ratio (SNR) required for reliable communication in a given system. The key Factors are defined as follow

- Probability of Detection (Pd): The likelihood of correctly detecting a signal.
- Probability of False Alarm (Pfa): The likelihood of mistakenly identifying noise as a signal.

For reliable detection, the SNR must exceed a threshold determined by the desired Pd and Pfa levels. We should also well balance the trade-off between detection reliability and false alarm probability.

The criteria are widely used in radar, sonar, wireless communication, and other signal processing systems to optimize performance and minimize errors.

Johnson defined three criterias: Detection, Recognition, and Identification (DRI)

Detection: Detection means that you will be able to see the target. Specifically it means that the target is visible on at least two pixels, and that there is a good chance that the target is actually something of suspicion.

Recognition: Contrary to what you might think, recognition does not mean that you can recognize an individual. Recognition simply means that you are able to recognize an object's class (is it a human or a car, is it a truck or a tank, etc).

Identification: Identification of an object means that you are able to differentiate between objects. For example, being able to identify the type of vehicle not just its class SUV or Tank for example.

	Detection	Recognition	Identification
Human	 3.6 pixels by 1 pixel (Something is there)	 13 pixels by 5 pixels (A person is there)	 28.8 pixels by 8 pixels (The person looks like a soldier)
Vehicle	 2.8 pixels by 1 pixel (Something is there)	 13 pixels by 5 pixels (A vehicle is there)	 28.8 pixels by 8 pixels (The vehicle may be a humvee)
Boat	 4.5 pixels by 1 pixel (Something is there)	 18 pixels by 2 pixels (Some kind of boat is there)	 36 pixels by 4 pixels (The boat is a small inflatable)





ATERMES – SURICATE LR Technology

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High-Performance Optronics:

- Cutting-edge optical technology for exceptional performance: High-resolution CMOS-based daytime camera and "cooled" thermal MWIR imager.
- Optical zoom for capturing crucial details over long distances: Capacity of spotting humans at 15 km and vehicles at 22 km

Artificial Intelligence and Edge Processing:

- Advanced engine swiftly detects recognize and identify various objects and provides real-time information for quick decisions.
- Available Kit to classify objects in different family of objects

Intuitive Control:

- User-friendly interface for real-time visualization and control.
- Automated patrol paths enhance surveillance efficiency.

Performance Metrics:

- Detection: >95% accuracy for detection/false alarms.
- Identification: >75% accuracy for automatic object classification

Unique Selling Points:

- Compared to short and medium range Radar detection, Suricate offers a passive and undetectable surveillance. Opposite to radar Suricate can offer an immediate image of the threat and even allow to transmit instant images to the troops.
- Long range radar can still scan quicker than Suricate however those radars are the first target by enemy in case of military attacks
- Suricate is also unique because of embedded AI and edge computing (Edge AI). Opposite to competitors who still privileged separate solutions with different Hardwares, Suricate is a compact solution and its transmission to the control center do not require large bandwidth for data transportation
- With its Embedded GPU computer, Suricate system process images differently by fusing day and night results within the environment of its deployment. This method obviously gives a much better performance than the competition





ATERMES – SURICATE performance (D/R/I)

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Field of observation	Pedestrian				Vehicle			
	Detection	Recognition	Identification	Automatic Classification	Detection	Recognition	Identification	Automatic Classification
20°	1,6	0,7	0,4	0,4/1,3	3,3	1,1	0,6	0,5/2,0
14°	2,6	1,0	0,5	0,6/1,9	5,9	2,2	1,1	0,8/3,0
10°	3,6	1,3	0,6	0,9/2,6	7,7	3,0	1,5	1,0/4,4
6°	6,0	2,0	1,0	1,4/3,4	11,2	4,8	2,5	1,8/6,0
4°	8,0	3,0	1,6	2,2/5,0	14,5	6,7	3,7	2,7/7,0
2°	13,0	5,8	3,0	4,4/8,0	20,0	11,2	6,7	5,5/10,0
1.4°	15,0	7,2	4,0	6,3/9,0	23,0	13,7	8,5	7,8/11,0

- Distances are expressed in Km
- For the measures we consider detection using the MAP (Mean Average Precision) method better than 95% with objects present in its training database, whose size on the thermal input image is 30 pixels.
- Suricate demonstrates a detection performance with a human in the loop (a human observer watches Suricate's video) of 15 km for humans and 22 km for vehicles with a visible surface area of 2.3m² in optimal visibility conditions.
- Suricate demonstrates a recognition performance with a human in the loop (a human observer watches Suricate's video) of 7 km for humans and 13 km for vehicles with a visible surface area of 2.3m² in optimal visibility conditions.
- Automatic classification refers to deep learning multispectral shape detection as implemented in Suricate
 - known objects as tiny as 20 pixels are automatically detected and identified and then categorized in a static view the first value for dark night the second value for day time (slide 17)
 - Practically customer in the deployment environment can establish classes with strict criteria. Every object identified responding to these criteria will be classified and the machine will refer to it in this class. For e.g. in a certain environment customer decides that all two-wheeled vehicles are forbidden. A class called two-wheeled vehicles can be created. Practically the machine will identify bicycles, motorcycles, scooters etc. and will classify them in this class. An alert can be created
 - A special kit of classification and a workshop is organized for each customer to train on this classification

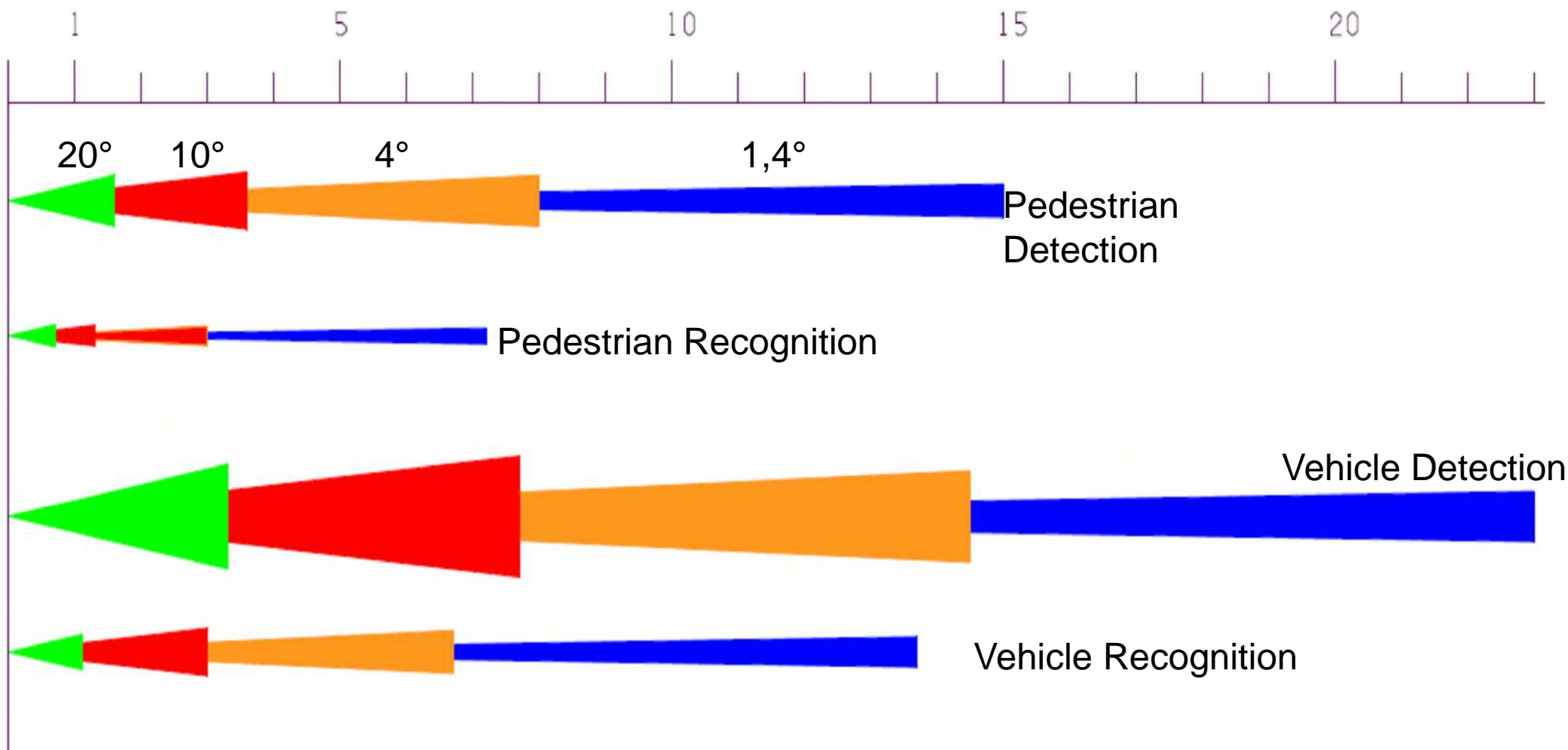




ATERMES – SURICATE Visual performance (D/R)

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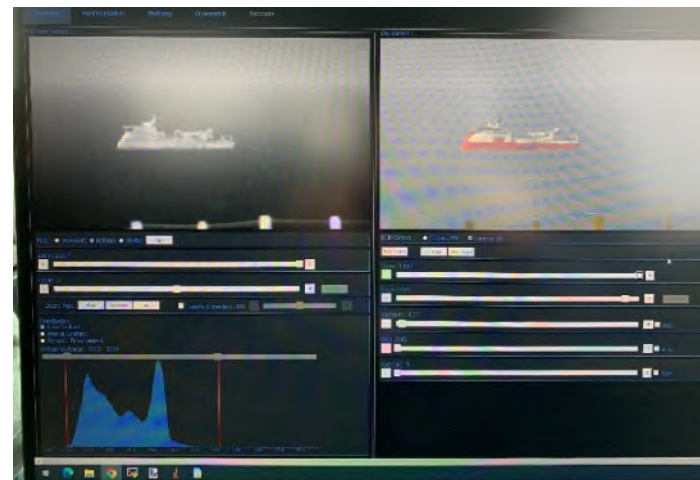
ATERMES – SURICATE Multi Spectral deep Learning

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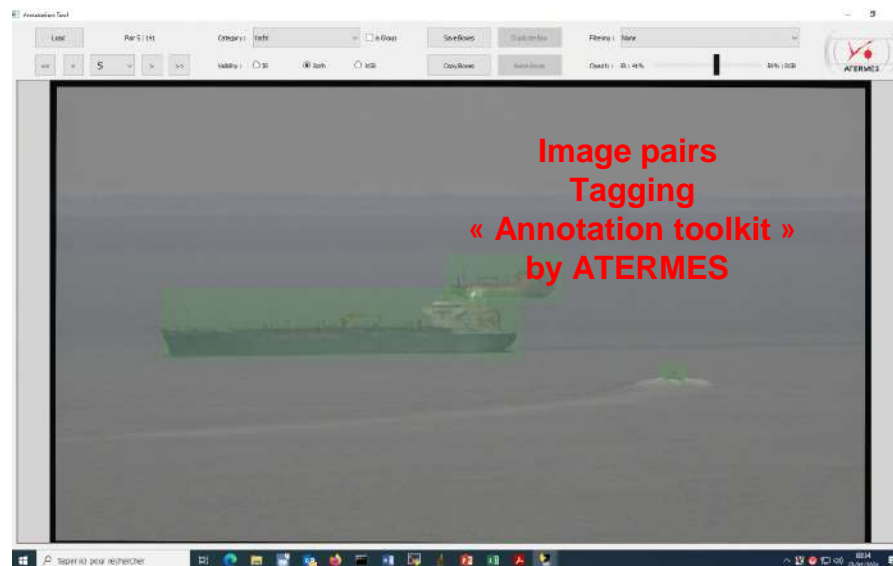
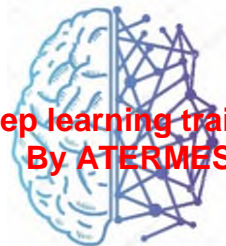
**Synchronized Image pairs
collection
with SURICATE
or dedicated head**



**Life-time Sensor
engine upgrades
by ATERMES**



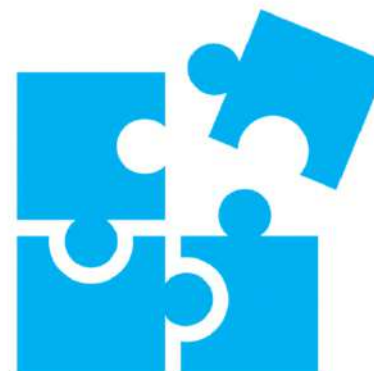
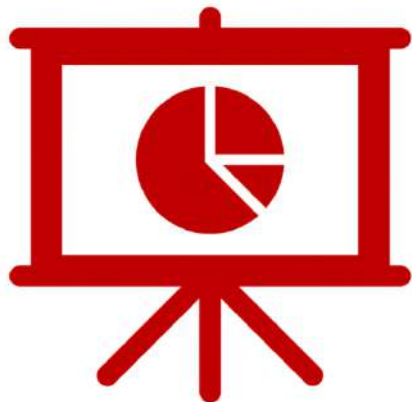
**Deep learning training
By ATERMES**





ATERMES – SURICATE Applications

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ATERMES – Border Surveillance

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How you want to control your border?

Events and threats

- Illegal immigration
- Smuggling
- Malicious infiltration



Actions

- Immediate spotting of people and vehicles
- Alerts and alarm
- Checkpoints mobilizations and patrol deployment



How to avoid smuggling on borders?

Events and threats

- Smugglers at border
- Suspicious containers
- Remote areas with difficult access

Actions

- Control of people and big objects at borders
- Discrete presence in remote areas
- Alarm and alerts



Can you control Fauna and flora?

Events and threats

- Species in danger
- Deforestations
- History preservation

Actions

- Direct and discrete control of species
- Equilibrium of flora
- Alerts and alarms



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Can you count how many people are in Camera view?

Events and threats

- Religious events
- Demonstrations
- Concerts and entertainments
- Sports

Actions

- Direct counting
- Alerts and alarm
- Checkpoints mobilizations



Can you spot dangerous items and Suspicious objects?

Events and threats

- International events
- Museums/exhibitions
- Concerts and entertainments
- Sports

Actions

- Before and after view with Gap analysis
- Alerts and alarms
- Direct messaging to patrols



Can you differentiate the flying objects even if very distant?

Events and threats

- Airspace surveillance
- Sensitive borders
- Sensitive industrial fields
- Nuclear and O&G sites

Actions

- Instant detection of flying objects and classifications
- Analysis of movement
- Alerts and alarms
- Direct messaging to air defense



You need to quickly detect Survivors and take them to hospitals

Events and threats

- Earthquakes and Tsunamis
- Bombed areas

Actions

- Instant recognition of people
- Day and night vision
- Thermal camera allows to detect below rabbles
- Alerts and alarms





ATERMES – Combat Mode

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Are you sure to capture most of your enemy movements?

Events and threats

- Combat field
- Mobile vehicles
- Terrestrial and naval field
- Defense and attack mode



Actions

- Instant detection of people and classification
- Instant detection of vehicle and classifications
- Alerts and alarms
- Direct messaging HQ





ATERMES – And

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