TESTUDO

**AUTONOMOUS SWARM OF HETEROGENEOUS RESOURCES
IN INFRASTRUCTURE PROTECTION VIA THREAT PREDICTION AND PREVENTION**

NOVEL DATA-DRIVEN AND PROCESS-ORIENTED SURVEILLANCE AND INTELLIGENCE PLATFORM FOR INCREASED AUTONOMY AND IMPROVED SITUATION AWARENESS IN CRITICAL INFRASTRUCTURES

Innovative Autonomous Platforms
- Unmanned ground and aerial vehicles
- Individual fixed sensors
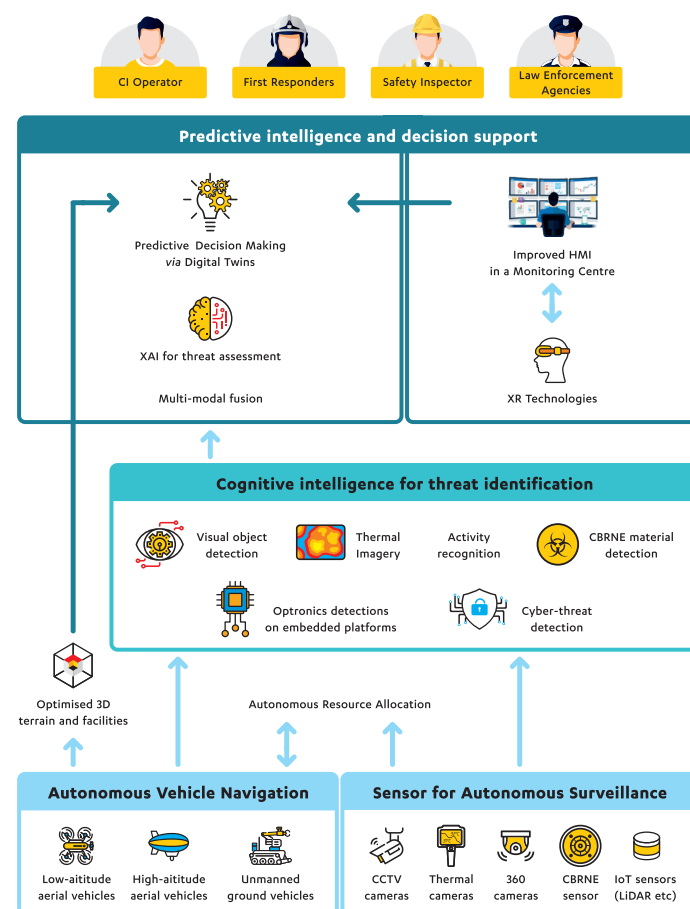
Autonomous Response and Cognitive Intelligence
- Optimal resource allocation
- Threat identification by processing optronics data
- Edge computing for limited connected unmanned vehicles
- CBRN materials identification
- Autonomous response on cyber-attack identifications

Improved HMI for critical infrastructure surveillance
- Optimized 3D terrain and infrastructure mapping
- Fusion schemes of numerous modalities
- Threat assessment *via* XAI technologies
- Predictive intelligence and improved HMI *via* Digital Twins
- Virtual decision-making tool

Short and long-term deployment for large-scale and cross-sectorial trials

TESTUDO ARCHITECTURE

CI Operator | First Responders | Safety Inspector | Law Enforcement Agencies

Predictive intelligence and decision support

Predictive Decision Making *via* Digital Twins

Improved HMI in a Monitoring Centre

XAI for threat assessment

Multi-modal fusion

XR Technologies

Cognitive intelligence for threat identification

Visual object detection | Thermal Imagery | Activity recognition | CBRNE material detection

Optronics detections on embedded platforms | Cyber-threat detection

Optimised 3D terrain and facilities

Autonomous Resource Allocation

Autonomous Vehicle Navigation

Low-altitude aerial vehicles | High-altitude aerial vehicles | Unmanned ground vehicles

Sensor for Autonomous Surveillance

CCTV cameras | Thermal cameras | 360 cameras | CBRNE sensor | IoT sensors (LiDAR etc)

**Use Case #1:
Disruptive online events in water reservoirs**

Cyber-threat detection – incident evolution visualisation based on the operator's decisions

**Use Case #2:
Chemical fire in tunnel provoked by an electric vehicle**

Mobile sensors for threat detection - situation awareness supported by Digital Twins, XR and HMI technologies

**Use Case #3:
Synchronized attack on water treatment facilities**

UAVs and UGVs for area patrolling - threat detection, assessment and visualisation

TESTUDO PARTNERS

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