

TESTUDO

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



www.testudo-project.eu



NEWSLETTER 1



SEPTEMBER 2024



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Dear Reader,

Welcome to the first issue of the TESTUDO Newsletter. We would like to introduce you to our project and its objectives, our team and first accomplishments after a year of the project implementation.

Our consortium is developing new tools and capabilities focused on enhancing the surveillance and protection of the European Critical Infrastructure, using autonomous systems and advance technologies to ensure their reliable and robust operation.

We believe that TESTUDO results will be a useful set of means for increasing the protection and resilience of CIs. If you are interested in updates on the project, please follow us on our social media channels, check the News section on our webpage and subscribe to the next issues of the Newsletter.



TESTUDO project team



About TESTUDO

TESTUDO is an international innovation project funded by the European Union under the Horizon Europe programme in Resilient Infrastructure addressing the **HORIZON-CL3-2022-INFRA-01-02 topic** (Autonomous systems used for infrastructure protection).

TESTUDO comprises an innovative approach that relies on autonomous assets both as market products and research outcomes, **to deliver a highly mature platform for continuous Critical Infrastructure monitoring** even at harsh environments and remote territories.

TESTUDO aims to enhance the surveillance and protection of the European Critical Infrastructure by accomplishing the following operational objectives:

- Providing **autonomous surveillance** via synergic operation of unmanned vehicles and fixed resources,
- Delivering **secure and efficient telecom networks** for remote areas and interoperable devices,
- Developing improved **AI-based cognitive models** for optimal surveillance,
- Incorporating **intelligence for prediction and coordinated response**,
- Ensuring **increased situational awareness** via **novel HMI** technologies,
- Validating the proposed solution via **large-scale and cross-sectorial demonstrators**,
- Enabling a **wider deployment of robotic technologies** within the European community **in the CI protection domain**.

TESTUDO consortium brings for collaboration an interdisciplinary team of individuals and organisations from **11 European countries** with a large experience in research on CI protection and autonomous surveillance, encompassing:

- **2 CI operators** (EYDAP, INTER)
- **8 RTOs** (CERTH, CENTRIC, CEA, PIAP, VICOM, SINTEF, DFKI, TEKN)
- **6 SMEs** (ACCELI, STWS, DRAXIS, ADS, DBC, T4i)
- **3 Large Industry** (NTTD-IT, ENG, PROS)
- **1 NGO** (LIF)



TESTUDO project partners



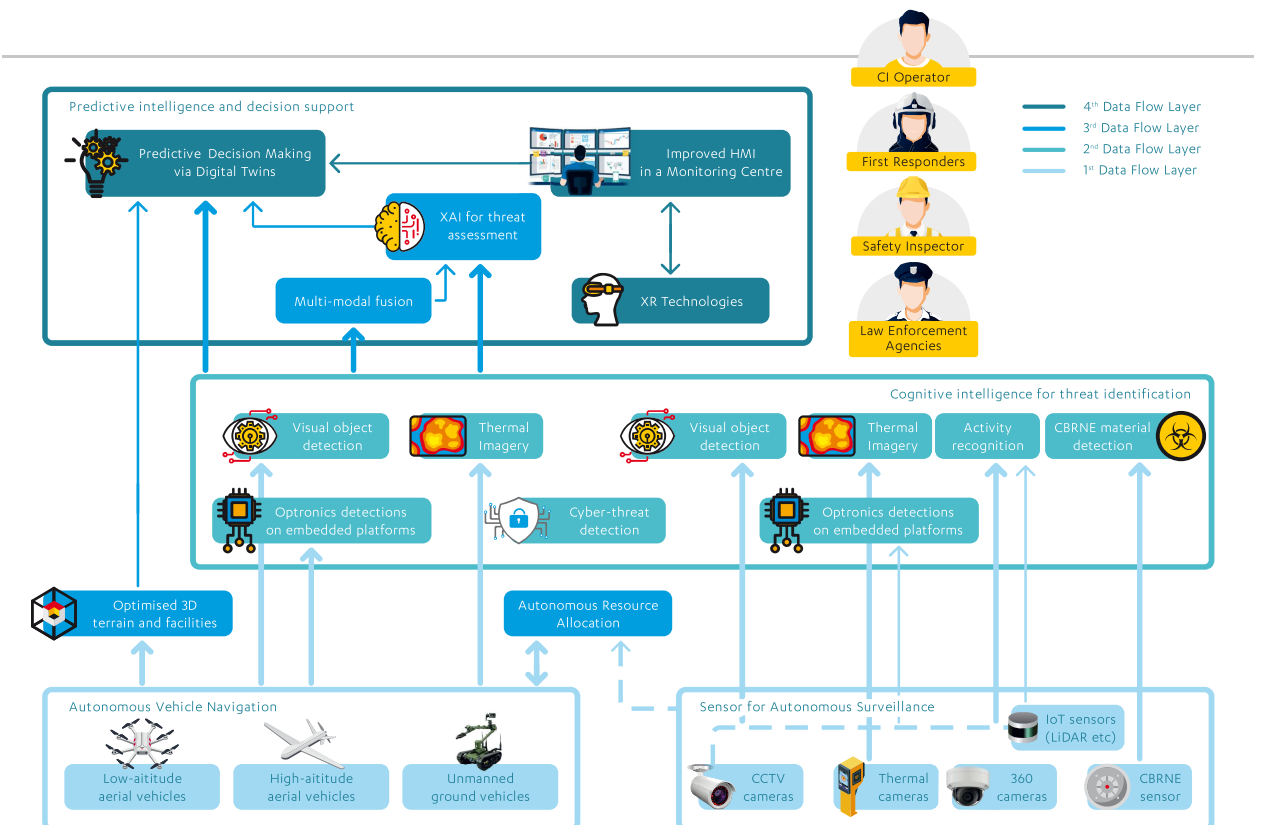
TESTUDO concept

TESTUDO will deliver a **novel data-driven and process-oriented surveillance and intelligence platform** for increased autonomy and improved situation awareness, incorporating:

- **innovative autonomous platforms** comprised by a set of unmanned vehicles and individual fixed sensors
- effective transmission of **heterogeneous multimodal data streams** to improve the critical issue for smooth operations and the integrity of CIs
- **advanced detection, monitoring and prediction tools** delivering pertinent information to the operator
- **virtual decision-making tool**

TESTUDO aims to equip CI operators and other relevant agencies with innovative technologies reinforced with research tools for optimal response and prediction/prevention, by employing:

- **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 for improved data representation
 - Threat assessment via XAI technologies
 - Predictive intelligence and improved HMI via Digital Twins
- **Short and long-term deployment for large-scale and cross-sectorial trials**



TESTUDO conceptual architecture scheme



Summary and accomplishments of the first project year

TESTUDO project has been **started in October 2023** with a kick-off meeting (KOM) hosted by its **coordinator Centre for Research and Technology Hellas (CERTH)** in Thessaloniki (Greece).

In addition to the project management tasks (WP1), activities in two work packages have been launched with the first month of the project (WP3 and WP11), while three other WPs were scheduled to start in the following months (WP4, WP6 and WP8).

The KOM was the first occasion for TESTUDO partners to meet in person and discuss in detail the scope of work in the project, the division of tasks between individual partners and the plan of their implementation.

The meeting was attended by the Project Officer from the Research Executive Agency (REA) and the representative of the EC's Directorate-General for Migration and Home Affairs (DG HOME).

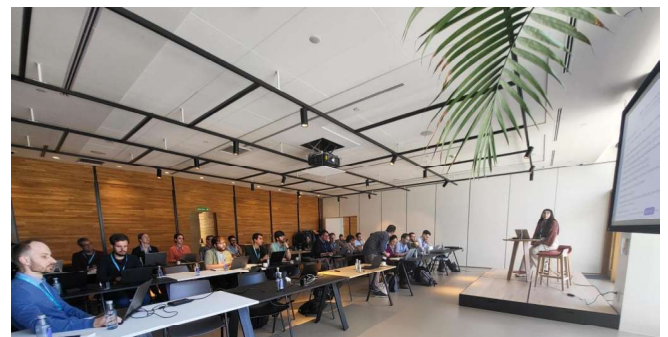


TESTUDO team at the KOM

In the first half year of the project implementation **three deliverables** have been produced and **successfully submitted to the EC within the planned schedule**, with the first one “Project management and quality assurance handbook”, completed in December 2023, followed by “Initial data management plan” and “Dissemination plan and communication materials” – all of them constituting a set of tools serving an efficient project execution and management of its outcomes. **Some of these outcomes will be publicly available on the project website** after they are approved by the EC services, during the first project review scheduled for end of March 2025.

Producing these results marked the **successful achievement of two project milestones**.

The first semester of the project has concluded with completion of the internal report from all active work packages, summarised additionally at the plenary consortium meeting in Donostia-San Sebastian (Spain) on 9-10 May 2024.



TESTUDO plenary meeting in San Sebastian

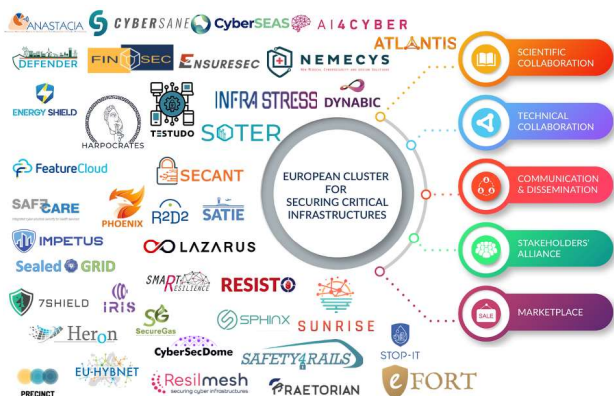
The research works of the various TESTUDO teams in the first year of the project implementation were primarily centred around WP3, covering the completion of physical and cyber risk analysis, the inclusion and handling of EUCI information and drafting the user requirements. All these efforts were targeted at producing three key project deliverables – two in June and one in September 2024.

These activities were supported by two important meetings focused on interaction with the end-users: PROS and STWS (WP3 partners) visit at EYDAP facilities in February 2024 and the first workshop with TESTUDO end users, hosted by DFKI in Berlin (Germany) in March 2024. These events covered discussions and semi-structured interviews with the end-user partners of TESTUDO (EYDAP and INTERBIAK) in order to gather an up-to-date information and details on the infrastructure, operational protocols, human resources and procedures that will define the development of the TESTUDO solution and preparation of the three trials planned in the project (WP10).



 TESTUDO WP3 meetings and workshops

Simultaneously, the works in other technical WPs (WP4, WP6, WP8) have been launched and continued, aiming at completion of their first deliverables for March 2025.



While TESTUDO progressed with all its technical goals, the consortium has also made efforts to spread the word to introduce the project to the wide audience.

In March TESTUDO has become a member of [European Cluster for Securing Critical Infrastructures](#), which main objective is to create synergies and foster emerging disruptive solutions to security issues via cross-projects collaboration and innovation.

April was the month of the [AUTOMATION and ROBOTICS EXPO 2024](#) in Athens (Greece), where the consortium was represented by one of the partners ACCELIGENCE LTD presenting the prototypes of their UAVs, which are utilised among different [TESTUDO assets](#): [CERBERUS](#) – a versatile octa-copter UAV capable of being equipped with a dedicated onboard processor and [DIOPTRA](#) – an electric fixed-wing aircraft with vertical take – off and landing capabilities.



 ACCELI at the AUTOMATION and ROBOTICS EXPO 2024

In May the Law and Internet Foundation (LIF) presented TESTUDO at the HEMUS Conference – a part of [International Defence Equipment and Services Exhibition HEMUS 2024](#) – the biggest annual defence and security event in the country of Bulgaria and one of the biggest in the region, with more than 200 registered participants, representing EC institutions, universities, research centres and military.



TESTUDO at HEMUS'24 Conference

The next month has brought two occasions for the consortium to communicate about the project.

First, on 17-21 June TESTUDO was presented at the stand of Sieć Badawcza Łukasiewicz – Przemysłowy Instytut Automatyki i Pomiarów PIAP (PIAP) during the [EUROSATORY](#) event – the largest international exhibition for the land and air-land defence and security industry, organised biennially in the Paris-Nord Villepinte Exhibition Centre in France. The event brings together more than 100,000 professionals working with defence and security and managing crisis situations: businesses, governments, military staff, institutions and private bodies as well as supranational organisations.

A week later, on 25-26 June, TESTUDO represented by CERTH and DBC, has taken part in the [Projects to Policy Seminar](#), organised annually by the REA and DG HOME. Each year the event welcomes the coordinators of all the newly launched EU-funded security projects with an aim to raise awareness among the relevant policy DGs on the new initiatives as well as to provide the projects with a guidance on the policy-related outputs that the policy DGs are interested in.



EC's Projects to Policy Seminar

At the beginning of July, before the peak of holiday period, NTT DATA had the opportunity to present TESTUDO to the representatives from the Sapienza University of Rome. A group of researches and professors visited the NTT Data office in Rome with a keen interest in public sector initiatives and projects.



TESTUDO presentation at NTT DATA office

During the meeting, the TESTUDO partner introduced their service line of innovation & advanced technologies, particularly focusing on Digital Twin and its applications in urban planning, infrastructure and city development. The presentation was well-received and the stakeholders engagement was a positive indication of the project's relevance in the public sector.



TESTUDO Stakeholders Community

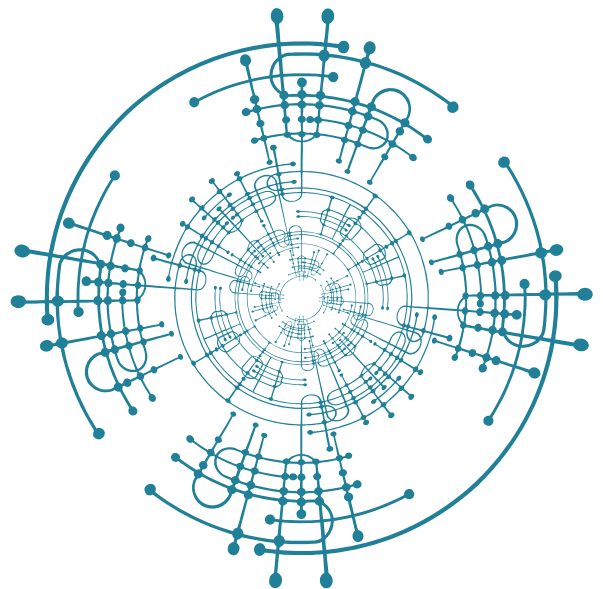
One of the goals for the TESTUDO consortium is to establish a **broad dialogue with all the stakeholders of the project on the solutions developed and collect feedback on expectations as well as on the results.**

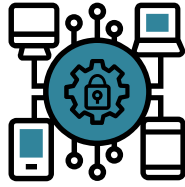
We are aiming to build a large community around the TESTUDO project that will encompass various end-users and stakeholders interested in **being informed on the progress of the project, its conclusions and results as well as in active engagement and support for different project activities.**

For that reason the **Stakeholders Forum** has been established and is coordinated by one of our project partners T4i engineering under a dedicated project task.

The following stakeholders have been initially identified:

-  **Tunnel construction companies and tunnel operators**
-  **Fire Brigades**
-  **Police**
-  **UAV providers**
-  **Chemical industries (refineries)**
-  **Traffic monitoring centres**
-  **Key players of the technologies developed in the project**





TESTUDO



Start date	01/10/2023
End date	30/09/2026
Call	HORIZON-CL3-2022-INFRA-01-02
GA no.	101121258
Partners	20
Countries	11
Project Coordinator	Centre for Research & Technology Hellas (CERTH)



Partners



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