



# List of Projects

## DETECTION HUB

### DETECTION HUB Workshop

Clustering innovative scientific approaches to enhance the detection of drugs, explosives and illicit goods.

**13** DEC  
2024

CETSE – Centro Tecnológico de Seguridad  
Madrid, Spain



Funded by  
the European Union

Funded by the European Union under GA of DRUG-DETECT No 101036225, MELCHIOR No101073899, PARSEC No 101073963 and BAG-INTEL No 101121309. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.





# Detection Hub



The Detection Hub Workshop: Enhanced innovative approaches detecting drugs, explosives & illicit goods is supported by the Detection Hub and is co-organised by the EU funded projects: DRUGDETECT, MELCHIOR, BAG –INTEL, and PARSEC, an initiative of the leading organisation Center for Security Studies (KEMEA). The workshop took place on the 13th of December, 2024 at Centro Tecnológico de Seguridad (CETSE) premises in Madrid, Spain.

Detection Hub is a collaborative dissemination and communication initiative of the following EU funded projects under the main thematic category of detection of drugs, explosives, and illicit goods. EU funded projects that comprise the Detection Hub are namely DRUGDETECT, BAG-INTEL, PARSEC, ODYSSEUS, I-FLOWS, UNDERSEC, EURMARS, MELCHIOR, COSMOPORT, SAUST, METEOR and RISEN.

The purpose of the Detection Hub is to discuss the challenges LEAs face as well as opportunities for introducing innovative and scientific approaches that will further target stakeholders' engagement and clustering activities, establishing strong synergies with multifaceted goals. The added value of the Detection Hub is that each EU funded project will be able to present its findings and objectives (up to the point of their development), identify common targets and exploitation capabilities, inform the market, and potential end-users from various sectors (Police and Custom Authorities, prisons, Agencies etc.).

**Find out more  
about the DETECTION HUB**



# **BAG-INTEL**

BAG-INTEL is a 3-year HE RIA, which kicked off in September 2023. By addressing the limitations and drawbacks of the current processes and without increasing the number of human resources involved in the process, the BAG-INTEL solution will enhance the effectiveness and efficiency of customs controls of incoming passenger baggage at airports through several features and capabilities, including:

- an AI-powered functionality for enhanced contraband detection in X-ray scanning of incoming luggage,
- an AI-powered risk assessment based on external data analysis,
- an AI-camera-based end-to-end reidentification of luggage, and
- a digital twin for system visualization and performance optimization.

Essentially, the aim of BAG-INTEL is to enhance customs control processes so that more contraband is detected and the cases of unnecessary manual inspections not leading to finding contraband decrease. The objective is to reduce false positives and flag only the bags containing contraband. Because the manual inspections will focus on all, and only, suspect luggage, more contraband will be captured without the need to involve extra human resources in the process. Furthermore, due to the fact that the proposed AI-camera-based luggage reidentification is non-intrusive, the drawbacks of the current methods, such as the need to place manual tags on suspect bags, will be eliminated.

**Find out more  
about BAG-INTEL**





DrugDetect is co-funded by the COSME program of the European Union and kicked off in January 2022 with 36 months duration. The DrugDetect consortium consists of 4 partners from academia, industry, and public bodies. The DrugDetect project procured an innovative solution for the automatic detection of a large range of drugs in correctional institutions and prisons, that would be available 24/7, would not cause delays in internal processes, would not require human intervention, and would be GDPR compliant.

DrugDetect promotes the use of public procurement for the development of innovative solutions. The public buyers in the consortium act as launching customers for innovative solutions to tackle their stringent needs for automatic, accurate and precise drug detection in a rapidly evolving drug market.

Following the identified needs and the market analysis, the DrugDetect Buyer's Group decided to pursue 3 Lots during the procurement procedure:

LOT 1 - Identification of drugs

LOT 2 - Detection of drugs inside packages/luggage and

LOT 3 - Detection of drugs on the body.

The consortium buyer's group conducted a competitive dialogue and through this process a contract was awarded in Lot 1. Lot 2 was cancelled because of lack of innovative solutions, while the tender was relaunched for Lot 3 with an open tendering procedure and a contractor was selected.

DrugDetect effectively promotes the use of public procurement, contributing to the development of innovative solutions able to tackle public needs in this sector. The DrugDetect results are encouraging other public buyers to make use of public procurement of innovative solutions.

**Find out more  
about DRUG-DETECT**





MELCHIOR is an EU funded Innovation Action project, which aims to improve substantially a novel technology for fast detection of drugs, explosives, weapons and illicit goods concealed on individuals and in critical cavities of the human body based on infrasound mechanical impedance interrogation, optionally complemented with other harmless and non-contact technologies.

Mechanical Impedance interrogation was validated in lab -TRL4- in the multiply awarded H2020 MESMERISE Project, detecting items concealed on trunk under clothes -including critical cases like warm molded materials that remain undetected to other technologies.

MELCHIOR aims to develop up to TRL7-8 blast-proof prototypes with detection capability extended to limbs and body cavities and improved sensitivity. Infrasound computer aided modelling improved Artificial Intelligence, altogether with improved new infrasound generators and sensors will enable an improvement in reliability and sensitivity. Combination with other non-contact technologies like low-cost mm waves and THz point echo sensors with no image formation will be explored.

**Find out more  
about MELCHIOR**





PARSEC delivers an ambitious set of solutions by developing, configuring, customising, and piloting innovative tools, services and security management views to fight the abuse of postal and express courier flows for criminal and terrorist purposes. The four PARSEC innovation areas and three “use cases” strengthen risk analysis and redefine threat detection and resilience capabilities of parcel service providers, customs authorities, police agencies, and other relevant stakeholders to fight crime and terrorism, put in place a stronger deterrent and to ensure safe and undisrupted postal and express services.

PARSEC seeks to find the optimal control setups (= least disruptive location, fast and reliable combinations of screening solutions, seamless operational procedures) for different threat types (drugs, explosives, CBRN and so forth). To achieve this, the project develops and tests solutions that have future potential to be integrated into the high-velocity, high-volume postal and express delivery process.

PARSEC seeks to provide law enforcement with a ‘360° view’ on cross-border traffic of parcels and letters by connecting customs data that come from different supply chain operations, support various business functions, and that become available at different points in the postal and express courier supply chain. PARSEC realizes the 360° view by connecting law enforcement partners to new data sources and by increasing their capability to exploit existing sources of information. PARSEC vision is to enable full integration of control operations and detection technologies into the flow of parcel delivery process at sorting centres, airport exchange offices, and customs facilities. Ultimately, this collaborative design and customization of the PARSEC architecture will contribute to seamless process integration, and a functional multi-actor ecosystem, that is a key requirement for high service quality and security excellence. The project will facilitate the exchange of risk-relevant data between postal and express operators, customs and police authorities.

**Find out more  
about PARSEC**





**ODYSSEUS**



The ODYSSEUS project aims to enhance the experience of border crossing for travelers and border authorities' staff while keeping secure and tracking the movements across external water and land borders of the EU. This initiative aims to protect passengers' fundamental rights while promoting the security and integrity of the European space by minimizing unauthorized cross-border movements of people and goods.

ODYSSEUS also intends to optimize the safety of customs and supply chain by improving the prevention, detection, deterrence, and fight against crime involving goods flows across EU external border crossing points and through the supply chain, reducing disruption to trade flows.

The new project is going to offer a comprehensive framework for improving border checks performed by authorities while also making travel easier for citizens who will be identified through multi-behavioral and biometric mechanisms which will make crossing borders quicker and simpler.

Furthermore, an innovative luggage and baggage check will allow citizens' vehicles and cargo vessels to be remotely checked for goods on the land border, speeding up border check processes in a safe and trustworthy manner. The ODYSSEUS platform will run in both land and water environments, in a road, in a port, and in a train. ODYSSEUS will be tested, evaluated, and showcased in three real operational scenarios.

ODYSSEUS is a 3-year, Horizon funded project that began in January 2023 and will last until December 2025. It involves 14 partners from Romania, Portugal, Greece, Cyprus, Belgium, Czech Republic, Italy, France, Bulgaria, Slovakia, Moldova, and the United Kingdom: SIMAVI, VISB, QBE, TEL, RAPI, ACCELI, SQD, THALES, ISIG, IGPF, CDBP, BBA, IGPF MAI and UIC. SIMAVI is leading the project consortium and activities, to successfully accomplish the project objectives and Key Performance Indicators.

**Find out more  
about ODYSSEUS**







iFLOWS aims to develop a novel framework for the effective and uninterrupted screening of postal/courier flows involving all actors across the transport chain. The main concept of iFLOWS is based on a multi-tiered approach to screening of letters and parcels, enhancing cross-organisation collaboration and intelligence and upgrading the threat, illicit material and dangerous substances detection process.

iFLOWS proposes a unique approach to assist customs, police and postal/courier services in preventing and detecting such crimes by improving operational readiness, enhancing situation awareness, reducing detection time, and achieving operational efficiency and superior mission performance.

## Project Challenges

- Identify CBRN (Explosives and Biological) threats inside envelopes and parcels, via imaging techniques and chemical analysis, without hindering the flow of packages
- Identify narcotics & fake pharmaceuticals inside envelopes and parcels, by performing throughparcel chemical detection, without hindering the flow of packages
- Identify fake identity documents & large amounts of cash in envelopes and parcels in real time without opening the post, taking advantage of novel security features embedded in said items
- Identify composite and polymer weapons and parcels, by performing through-parcel chemical detection, without hindering the flow of packages

**Find out more  
about I-FLOWS**





UnderSec project will develop a modular, holistic approach integrated, interoperable and cyber-secure Prototype System, to enhance underwater security operations of ships, ports and maritime infrastructures. The UnderSec system will consist of multimodal (i.e. optical, EM, acoustic) sensors, fixed and/ or integrated onboard robotic assets (i.e. ASV, LAUV), assisted by multimodal AI, ML, DL and Digital Twins techniques, Risk Assessment and Crisis Classification SW services for ships', ports' and maritime infrastructures' Underwater Security Situational Awareness, including early detection, recognition and classification of illegal packages with concealed drugs strapped/ attached to ships' hull, Common Operational Picture generation and distribution to all interested stakeholders, Decision-Making Support (to the users) SW service, with relevant Command/ Control/ Communication/ Response/ Reporting capabilities. Individual technologies will be tested, compared with each other and pre-evaluated in a controlled environment, while the modular components and the system as a whole will be tested and evaluated during real-life Pilot Use Case (PUC) demonstrations in real operational environments and two demonstrations series, resulting in the establishment of new knowledge, innovative and beyond the current State-of-the-Art solutions, advanced processes and eventually the underwater security operations enhancement along with relevant justified regulatory framework upgrade suggestions.

**Find out more  
about UNDERSEC**





EURMARS is an advanced surveillance platform to improve the EUROpean Multi Authority bordeR Security efficiency and cooperation. By integrating cutting-edge technologies like artificial intelligence (AI), advanced risk assessment tools, and real-time visualisation, EURMARS strengthens the EU's ability to monitor and protect its maritime borders. The platform utilizes state-of-the-art sensing technologies, including high-altitude platforms, satellite imagery, unmanned aerial vehicles (UAVs), and ground-based sensors, offering comprehensive surveillance capabilities.

The project primarily benefits national and EU-level Border Authorities (BAs) such as coast guards, customs, police, and environmental protection agencies. EURMARS addresses key challenges in irregular migration, smuggling, and trafficking networks, while also supporting search and rescue operations in line with international obligations at sea. Furthermore, it tackles environmental challenges such as oil spill observation and monitoring.

The core focus of EURMARS is fostering coordination between different authorities at the national and EU level. By bridging operational gaps, the platform enhances cooperation between agencies involved in border management, environmental protection, and maritime safety, ultimately contributing to a more secure and well-coordinated European maritime space.

**Find out more  
about EURMARS**





CosmoPort will develop the next generation of mobile scanner systems using Atmospheric Ray Tomography (ART), which are equipped with advanced Machine Learning-based risk assessment tools. As muon tomography itself is a technique already in use, we'll develop the first mobile solution combined with AI/ML tools to enhance material and object classification for the first time ever.

This novel approach addresses the increasing challenge of efficiently scanning the growing volume of goods and parcels shipped through various logistics channels. The project's ambition is to deploy the first mobile ART solution enhanced with AI/ML for improved material and object classification.

Spanning 36 months (Oct 2023 - Oct 2026), CosmoPort brings together a consortium led by GScan, including prominent partners such as Fondazione Bruno Kessler, various national customs and tax authorities across Estonia, Latvia, Greece, Finland and UK, as well as law enforcement agencies like the Hellenic Police. The project emphasizes collaboration across borders to tackle the challenges of modern logistics and security, setting a precedent in the application of cutting-edge technologies for public safety and customs efficiency.

**Find out more  
about COSMOPORT**





SAUST is an EU funded Innovation Action project, which aims to adapt current vapor detection technologies for the detection of narcotics, mainly cocaine, in the aviation sector, specifically in the baggage at the arrivals.

The SAUST concept is based on the technology developed by MION for vapor detection, specifically the technology DMA-MS with the capacity to detect vapor concentrations at the level of sub-ppq (parts per quadrillion) which has been validated for detection at container level with explosives and cocaine,

The project aims at the development of the SAUST baggage screening system up to TRL7-8 with the technical support of STAM and includes the validation at real airports in Spain and Greece with the support of KEMEA.

The project also includes performing the initial chemical characterization of NPS (New Psychoactive Substances), such as Fentanyl and precursors, for future detection using vapor techniques.

**Find out more  
about SAUST**



# RISEN



The RISEN project aims at providing fast and accurate responses in the initial phase of investigations and directly on-site (classic forensic scenarios and disaster sites), to allow directing the subsequent police activities towards the specific necessary tasks for capturing the responsible of a crime and preventing further offences.

The objectives of the RISEN project will be obtained by:

- Developing and demonstrating sensors, some of which contactless and automated for proximal measurements, to identify, select and label trace materials, with a consequent reduction of the time and resources in the laboratory;
- Processing and sending rapidly acquired in-situ data to a 3D Augmented Crime Scene Investigation (3DA-CSI) system to produce an interactive realistic 3D model of the crime scene, augmented with the position and labelling of traces and evidence resulting from on-site analyses, and allowing a fast exchange of information among LEAs.

The recreated 3D model of the crime scene will present sensor data, collected traces and identified points of interest in order to deliver a realistic and immersive visual environment for investigators, allowing them to conduct highly detailed investigations, and to have the acquired information available at any time for several purposes in the criminal justice system.

The identified traces will be digitally marked and inventoried, and a digitalised Chain of Custody will be established, implementing mechanisms that assure data integrity over its lifecycle.

The fusion of complementary and orthogonal analytical information in a system of systems will provide a better discriminating power of a wide set of chemical and biological materials of forensic interest and it will allow for the gathering of more informative profiles of the investigated traces.

**Find out more  
about RISEN**





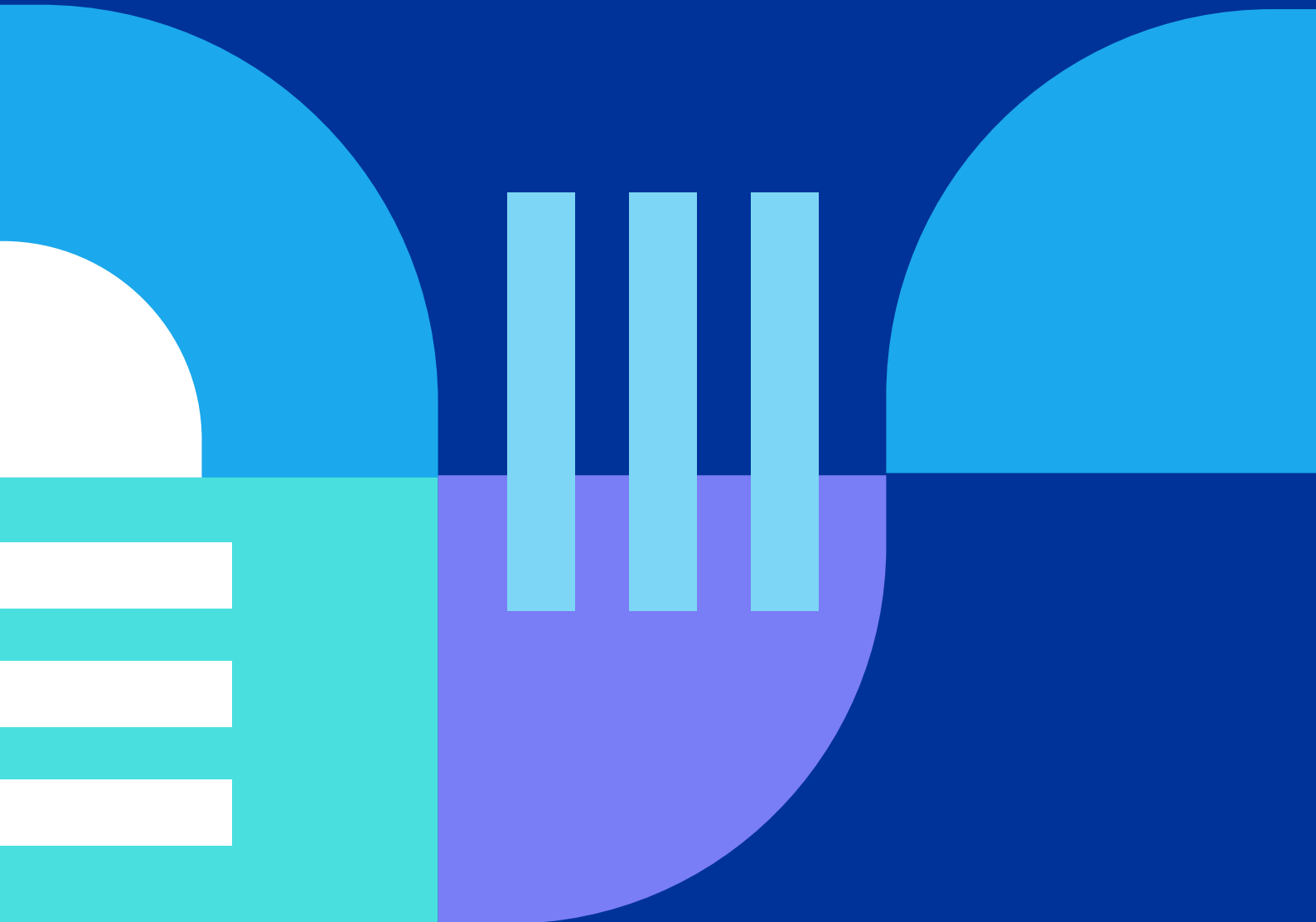
Presently, only a small percentage of shipping containers undergo inspection, a result of both the heightened container traffic and limitations in existing screening techniques, particularly X-ray screening, for the non-intrusive inspection of entire containers. A multi-layered approach is essential, ultimately enhancing detection capabilities and reducing the need for physical inspections.

METEOR (EU-Funded Project) aims to revolutionize cargo screening with innovative and efficient technology capable of delivering fast, reliable, and economical container inspections, to provide customs authorities with an effective screening solution to detect various threats and combat illicit goods trafficking, particularly illicit drugs.

METEOR utilizes vapour-based technology, achieved by collecting a sample of air representative of the container's interior and subsequently analyzing its chemical content. It is non-destructive, can be designed to be minimally intrusive and safer for the screener, and has the potential for complete automation, eliminating the need for human interpretation. This technology aims to enhance the efficiency of current screening methods, enabling customs agencies to inspect more containers, contributing to increased border security, and ultimately, safeguarding citizens and infrastructure.

**Find out more  
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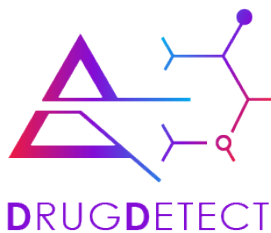


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**Website : [www.bag-intel.eu](http://www.bag-intel.eu)**



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The fusion of complementary and orthogonal analytical information in a system of systems will provide a better discriminating power of a wide set of chemical and biological materials of forensic interest and it will allow for the gathering of more informative profiles of the investigated traces.

**Website : <https://drug-detect.eu/>**

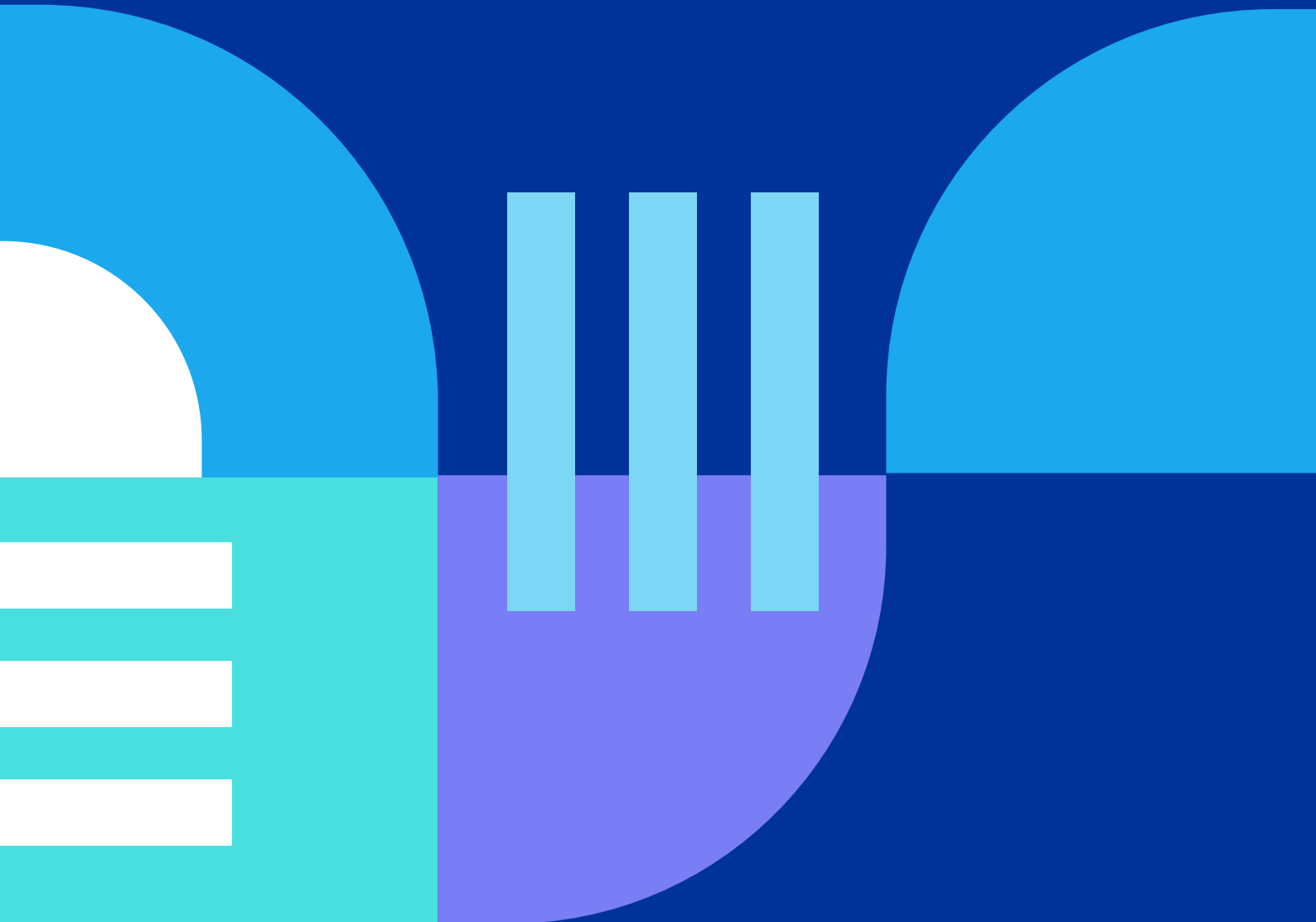


Presently, only a small percentage of shipping containers undergo inspection, a result of both the heightened container traffic and limitations in existing screening techniques, particularly X-ray screening, for the non-intrusive inspection of entire containers. A multi-layered approach is essential, ultimately enhancing detection capabilities and reducing the need for physical inspections.

METEOR (EU-Funded Project) aims to revolutionize cargo screening with innovative and efficient technology capable of delivering fast, reliable, and economical container inspections, to provide customs authorities with an effective screening solution to detect various threats and combat illicit goods trafficking, particularly illicit drugs.

METEOR utilizes vapour-based technology, achieved by collecting a sample of air representative of the container's interior and subsequently analyzing its chemical content. It is non-destructive, can be designed to be minimally intrusive and safer for the screener, and has the potential for complete automation, eliminating the need for human interpretation. This technology aims to enhance the efficiency of current screening methods, enabling customs agencies to inspect more containers, contributing to increased border security, and ultimately, safeguarding citizens and infrastructure.

**Website : <https://www.meteor-project.eu/>**



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