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BM-01-01 ● BM-01-02 ● BM-01-03

BM Review Team

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BM SESSION – PRESENTATIONS

BM-01-01	Rita Nogueira	rita.nogueira@treetk.com
BM-01-02	Ivo Häring	ivo.haering@emi.fraunhofer.de
	Paulina Polko	ppolko@wsb.edu.pl
BM-01-03	Tobías Jochum	tobias.jochum@iap.fraunhofer.de
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SMI2G 2025

BM-01-01

HORIZON-CL3-2025-01-BM-01: Open topic on efficient border surveillance and maritime security

Presenters

Rita Nogueira   *rita.nogueira@treetk.com*

- *Rita Nogueira*
  - *rita.nogueira@treetk.com*
- *TREE TECHNOLOGY (Spanish SME)*

  - *Participation in > 30 EU projects*
  - ***10 on-going H2020/HEUR projects***
  - *Expertise in Big Data, AI, Computer Vision, and cybersecurity*

- Role: *WP leader, S/T provider*
- Topic to be addressed: ***HORIZON-CL3-2023-BM-01: Open topic on efficient border surveillance and maritime security***
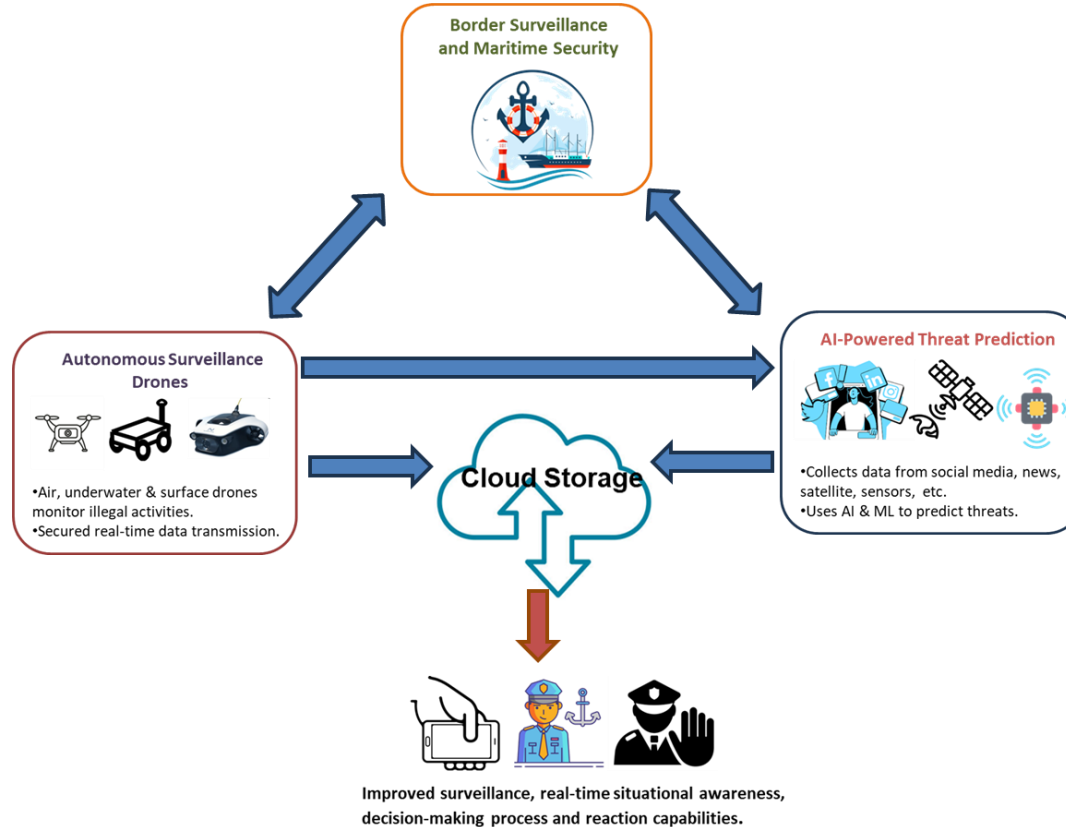
4

Proposal idea/content

- *Motivation:*
  - *Current border security systems **lack interoperability**, making it difficult to efficiently track **illegal border crossings, smuggling, and unauthorized drone activities**.*
  - *Border authorities require **real-time, AI-driven data** fusion to improve **decision-making and rapid response** in critical situations.*

- *Solution:*
  - *Fuses **radar, acoustic, electro-optical, and AI-driven analytics** to provide a **real-time Common Border Picture** for security forces.*
  - *Border guards receive **filtered, refined, and intuitive** visual information, enabling **faster threat identification and response**.*

5

Proposal idea/content

Border Surveillance and Maritime Security

Autonomous Surveillance Drones
- Air, underwater & surface drones monitor illegal activities.
- Secured real-time data transmission.

Cloud Storage

AI-Powered Threat Prediction
- Collects data from social media, news, satellite, sensors, etc.
- Uses AI & ML to predict threats.

Improved surveillance, real-time situational awareness, decision-making process and reaction capabilities.

Rita Nogueira (*rita.nogueira@treetk.com*)

Project participants

- Looking for partners with the following expertise.
  - Final users: border authorities/coast guards
  - Experts in autonomous drones/sensors
  - Experts in mobile interfaces
  - Experts in communication/interoperability
  - Coordinator

- Which role do you prefer in a consortium?
  - Technical provider/WP leader
    - AI and ML
    - Computer vision
    - Cybersecurity

Rita Nogueira (*rita.nogueira@treetk.com*)

BM-01-02

HORIZON-CL3-2025-01-BM-02: Open topic on secured and facilitated crossing of external borders

Presenters

    Ivo Häring   *ivo.haering@emi.fraunhofer.de*

    Paulina Polko   *ppolko@wsb.edu.pl*

8

IDRobot: Robot for semi-collaborative identification of persons at Borders

- *Ivo Häring*
  - *ivo.haering@emi.fraunhofer.de*
- *Fraunhofer EMI*

- Role: *WP leader or Technical/Scientific coordinator*
- Topic to be addressed: **HORIZON-CL3-2025-01-BM-02**: *Open topic on secured and facilitated crossing of external borders*

- *Related similar past/starting projects:*
  XP-DITE, TRESSPASS, OnMoveID

9

IDRobot **interacts** **with traveller**
with biometric **in several** **iteratively**
capabilities: **modalities**
face, finger-
prints, iris ...

https://www.ekemp.com.cn/iris-scanner-with-dual-infrared-led

http://dx.doi.org/10.3390/biomimetics8080616

https://www.foxnews.com/travel/flight-passenger-106-says-airport-personnel-confiscate-bag-her-age-not-some-stupid-old-lady

Multi-Biometric Robot for person identification at borders that communicates verbosely and with bionic hand

Key ideas:

- *Conduct same checks as human border authority officer*
- *Ensure haptic interaction with physical ID documents*
- *Use ID document scanner device level multispectral cameras for document identification*
- *Offers fingerprint scanning device, and iris scan (if part of ID document)*
- *Engage traveler in conversation related to ID documents' contents*
- *Assume semi-collaboration, including collaboration as-if*
- *Robot may move around person, if part of person are obscured*
- *Ensure single person identification*
- *Focus on EU-wide accepted biometric traits only*
- *Robot in connected to border authority data management system*
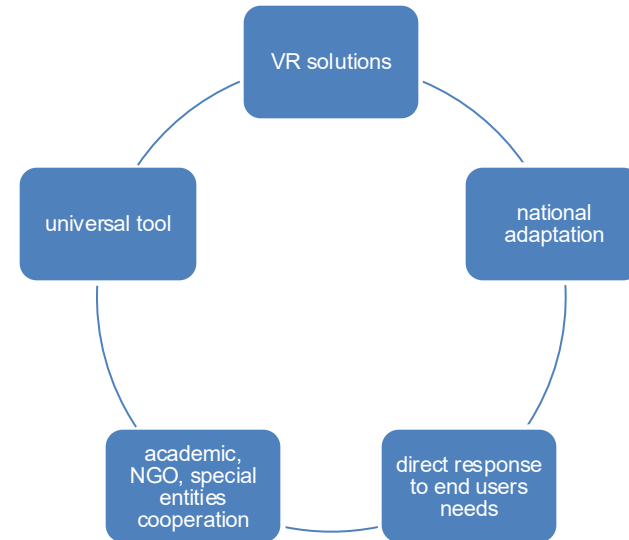
Unique selling points aimed at:

- *Only space needed corresponding to space for 2 persons to communicate, i.e. ca. 2x2m*
- *Fast scaling and movable solution*
- *Cable-based electricity supply, e.g. from ceiling*
- *No additional data storage and biometric data acquisition*
- *Adaptive robot-human interaction to increase certainty identification*

Ivo Häring, ivo.haering@emi.fraunhofer.de

Project participants

- **Existing consortium:**
  - Proposed coordinator: *Open*
  - RTO covering assessment of security, reliability, resilience of approach
  - RTO (or SME tbc) covering accurate localization and orientation of robot

- **Looking for partners with the following expertise/ technology/ application field (Large scale operators):**
  - Industry or SME: Expert regarding haptic interaction with humans, ID-document handling, "soft robotics"/"Robot hand", including system integration
  - ID document multispectral scanning and digital identity reading
  - Hardware/Sensor expert for face recognition, fingerprint and iris scanning
  - Industry or SME: Robot experts in the area of biometric identification of persons/interacting operators in industrial setting using face and iris recognition (and voice recognition)
  - SME Biometric experts for face recognition, fingerprint recognition, and/or iris recognition at Schengen borders
  - SSH/Legal expert to ensure compliancy
  - Company with experience in large scale identity document verification
  - SME ID Fraud identification expert
  - Custom authorities, police authorities

miVRation

- *Paulina Polko, PhD, DSc, Assoc. Prof.*
  - *ppolko@wsb.edu.pl*
- *WSB University*
- Role: *Proposal coordinator / WP leader*

- Topic to be addressed: **HORIZON-CL3-2025-01-BM-02: Open topic on secured and facilitated crossing of external borders**

13

miVRation: VR training scenarios on cross-border and migration security

- *As migration challenges create the necessity to enhance human resources for state border protection, including conducting border controls and combatting illegal migration, miVRation offers solutions for training border services to carry out border control activities controls.*

- *The project concentrates on situations involving border guard and migrant interactions, aiming to equip the services to manage the control process effectively, ensuring security requirements are met for both state and non-state actors.*

VR solutions

national adaptation

direct response to end users needs

academic, NGO, special entities cooperation

universal tool

14

Paulina Polko, PhD, DSc, Assoc. Prof.; ppolko@wsb.edu.pl

Project participants

- Existing consortium:
  - Proposed coordinator: *WSB University*
  - Partners / Other participants: *Universities and stakeholders from Q-Helix European University Alliance* https://www.linkedin.com/company/q-helix/

- Looking for partners with the following application fields:
  - *Academic partners ready to prepare VR scenarios based on the proposed methodology*
  - *End users – especially Border Guard – to test the tool*

BM-01-03

HORIZON-CL3-2025-01-BM-03: Open topic on better customs and supply chain security

Presenters

Tobías Jochum   *tobias.jochum@iap.fraunhofer.de*

Rita Nogueira   *rita.nogueira@treetk.com*

Ioannis Androulakis   *info@manibus-group.eu*

No more illegal goods?!

Dr. Tobias Jochum (Role: Proposal coordinator)
- tobias.jochum@iap.Fraunhofer.de
- Fraunhofer Institute for Applied Polymer Research IAP

Topic to be addressed: **HORIZON-CL3-2025-01-BM-03**
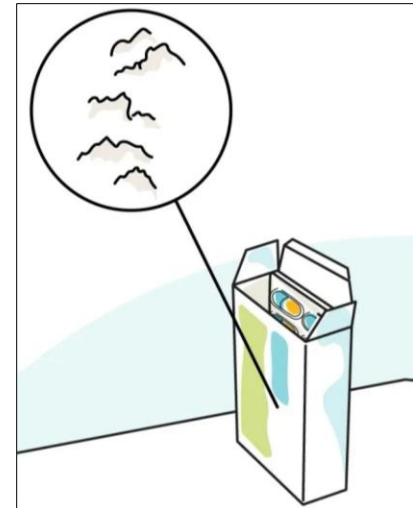Open topic on better customs and supply chain security

We are living in a connected world. Our supply chains need to be secure and transparent.
- Illegal goods, like counterfeits cost European companies **€60 billion/year**
- EU states also lose out on taxes **16.3 billion/year**
- **470.000 jobs loss/year** due to counterfeiting products

17

Proposal idea/content

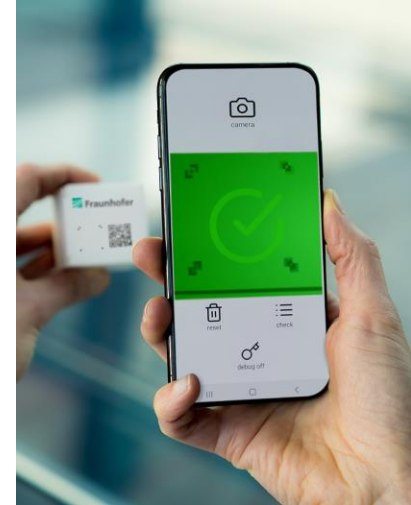Innovative technology solve the problem of illegal goods like counterfeiting:

- Every product/package is **unique**
  - Sub-micrometer surface texture creates an unique **fingerprint** (item level)

- Even **mobile phones** can detect this
  - **Everybody** can easily verify the product.

- Transform it into an **authentication tool**
  - **Securing the supply chain**

Proposal idea/content

This authentication tool:

- is incredibly **user-friendly** and **accessible** due to the use of cell phones

- is designed to match perfectly to the EU **digital product passport**

- is the only way you ensure **traceability, authenticity** and **value communication**

Use case
Securing the supply chain within EU borders and beyond – no more illicit or illegal goods for European citiziens.

Dr. Tobias Jochum // tobias.Jochum@iap.Fraunhofer.de

Project participants

Existing consortium

- Proposed coordinator: Dr. Tobias Jochum
- Partners/other participants:
  - Fraunhofer: technology
  - 1 German SME (confirmed): implementation
  - 1 French SME (confirmed): dissemination
  - German customs (requested): testing and validation | practitioners

Looking for partner with the following expertise/ technology/ application field:

- Partner with the human right, law and ethical perspectives on securing the supply chain (social sciences, lawyers, IP sciences)
- Customs authorities from different countries to get a perspective from security practitioners
- Partners with existing counterfeiting products and the urge to change this

- *Rita Nogueira*
  - *rita.nogueira@treetk.com*
- *TREE TECHNOLOGY (Spanish SME)*

  - *Participation in > 30 EU projects*
  - *10 on-going H2020/HEUR projects*
  - *Expertise in Big Data, AI, Computer Vision, and cybersecurity*

- Role: *WP leader, S/T provider*
- Topic to be addressed: ***HORIZON-CL3-2025-BM-03: Open topic on better customs and supply chain security***
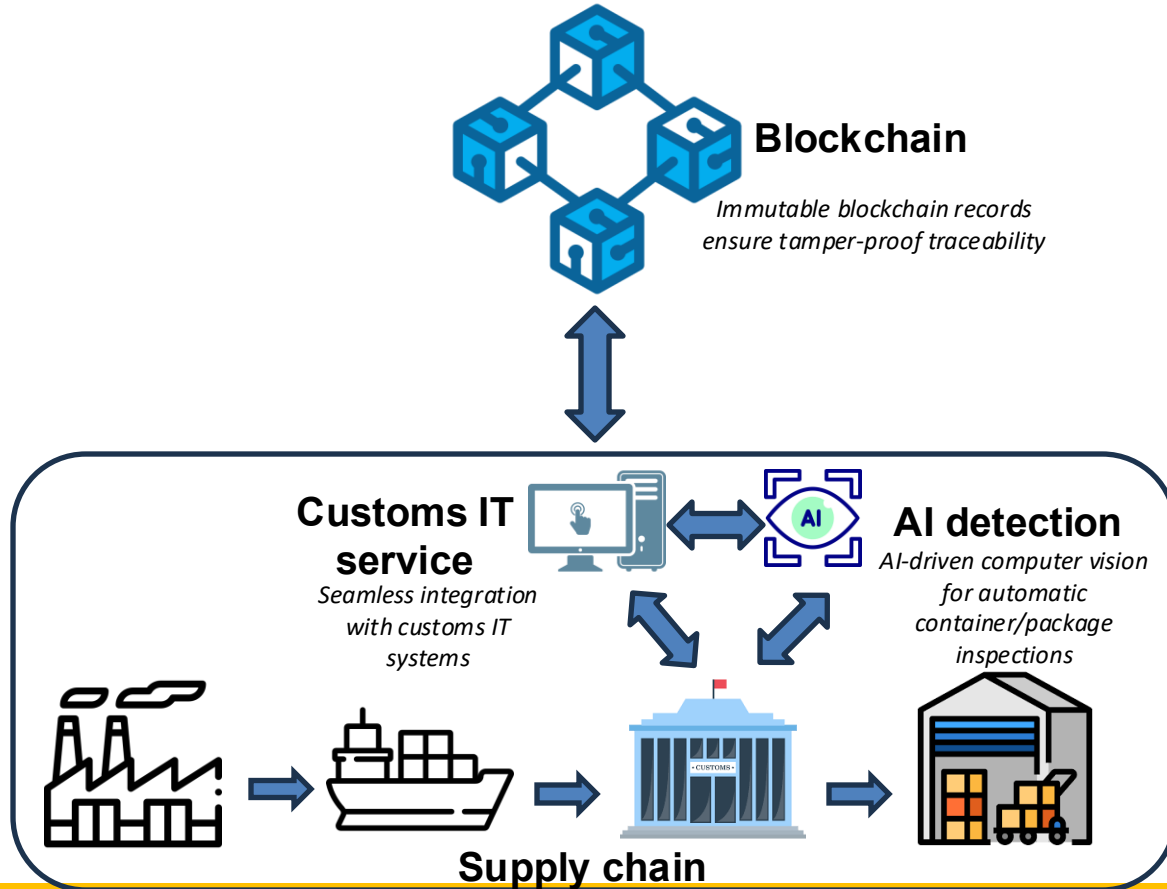
Proposal idea/content

- _<u>Motivation:</u>_

  - _**Rising threats**: smuggling, counterfeiting, illicit trade (CBRN-E, contraband, endangered species, etc.)._
  - _Current customs systems **lack transparency & interoperability.**_
  - _Need for **secure, real-time, automated tracking & verification** of shipments._

- _<u>Solution:</u>_

  - _**Enhance Supply Chain Security** – Leverage blockchain and AI to provide real-time traceability, transparency, and tamper-proof records for goods crossing EU borders._
  - _**Strengthen Detection & Prevention** – Utilize AI-driven automated inspections and anomaly detection to identify fraud, tampering, and illicit trade._
  - _Smart contracts **automate compliance verification & fraud detection.**_
  - _**Ensure Compliance & Efficiency** – Support customs authorities and regulatory bodies with seamless trade flow, and adherence to EU regulations._

22

Proposal idea/content

Blockchain

Immutable blockchain records ensure tamper-proof traceability

Customs IT service
Seamless integration with customs IT systems

AI detection
AI-driven computer vision for automatic container/package inspections

Supply chain

Rita Nogueira (*rita.nogueira@treetk.com*)

6&7 May 2 025, Paris

SMI2G 2025

Project participants

- Looking for partners with the following expertise.
  - Customs Authorities
  - Supply chain security & logistics specialists
  - Experts in interoperability
  - Experts in human rights, law and ethics
  - Technical partners who can complement this idea
  - Coordinator

- Which role do you prefer in a consortium?
  - Technical provider/WP
    - Expertise for AI-driven fraud detection
    - Developing smart contracts & blockchain-powered compliance verification
    - Cybersecurity

24

ED-ASSI Project Proposal

Early Distant **D**etection and Early Warning of distinguished illicit/ dangerous transported goods, for focused/ prioritized cargo inspections, and Advanced **A**nalysis of **S**upply Chain **S**ecurity **I**ntelligence

- *Name of proposer/speaker: (Mr) Ioannis ANDROULAKIS*
  - *e-mail: info@manibus-group.eu*
- *Company/ Organisation: MANIBUS OOD*
- Role: *Proposal coordinator, WP leader*
- Topic to be addressed: **HORIZON-CL3-2025-BM-01-03: Open topic on better customs and supply chain security**

25

Description of the proposed project

Focused/ prioritized cargo inspections, at customs and cross-border check points, through illegal and dangerous cargo distant detection, tracking, early warning for cargo screening, saving valuable time, assets and resources, without disrupting the trade flows.

SMI2G 2025

26

ED-ASSI Proposal idea/content

Description of the proposed project

Operational Concept/ materialisation technologies

Real-time/ early/ <u>distant, from several kilometres</u>, detection and tracking of distinguished illicit goods (i.e. drugs such as cocaine and heroin) **and dangerous goods** (i.e. explosives such as TNT, T4, dynamite, etc.), **<u>and early warning,</u>** with the utilisation of suitable EM transceivers, exploiting the physical properties of substances at the sub-molecular level, the Poynting vector, and the EM flux properties and enforced EM bonds.

Real-time Illicit/ dangerous goods carriers' identification, through their ID data capturing on-the-go, data fusion, correlation with early warning findings, and analysis with AI

Legitimate cargo and false alarms exclusion, with local and transportation intelligence data, collection, fusion and analysis with AI

Criminals' Modus Operandi and operational patterns recognition, through big data collection, correlation with early warning and focused cargo inspections findings, and analysis with AI

27

ED-ASSI Project participants

- **Existing consortium:**
  - Proposed coordinator: *MANIBUS OOD / Operational Consultant / Bulgaria*
  - Partners / Other participants:
    - *Big Software House: Decision-making Support System and Integrator / Luxemburg (confirmed)*
    - *Software House / Multimodal Sensing and AI / No of partners: 2 / Greece (confirmed)*
    - *Non-Profit Organisation with SSH expertise to also call Third Parties for support during the project / Greece (confirmed)*
    - *Customs Authorities to facilitate demos / No of partners: 4/ Greece, Romania, Moldavia, Spain (To be confirmed)*
    - *Port/ Airport Authorities to facilitate demos / No of partners: 2 / Greece (To be confirmed)*
    - *Law Enforcement Authorities to facilitate demos / No of partners: 2/ Romania, Greece (To be confirmed)*
- **Looking for partners with the following expertise/ technology/ application field:**
  - *Customs Authorities / End Users to potentially facilitate/ host demos*
  - *Logistic Support Company / Freighter and cargo carrier to facilitate demos*

28

BM SESSION – THE END

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