



THE TENSOR CHRONICLE

Welcome to the sixth edition of the TENSOR chronicle!

ISSUE: January 2026 | VOL.VI

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Dear TENSOR Community,

We are delighted to share the latest updates from the TENSOR project as we have reached the final days of implementation. The past period has been marked by important milestones and achievements ultimately leading the TENSOR team to a strong finale.

We successfully concluded the 2nd phase of pilot iterations. TENSOR was also proud to contribute in scientific society 3 more publications. A second white paper is available including policy recommendations driven by the project's results and experience.

Our team remained active in the community by participating in high-profile events and proud to have hosted TENSOR's Final Conference, turning it to a major Cluster 3 event, reconnecting once again with 9 EU funded projects, **AVALANCHE, FLEXI-cross, ODYSSEUS, SafeTravellers, AutoBorder, IAMI, EINSTEIN, PopEye** and **ARMADILLO**.

Best regards,
The TENSOR Project Team

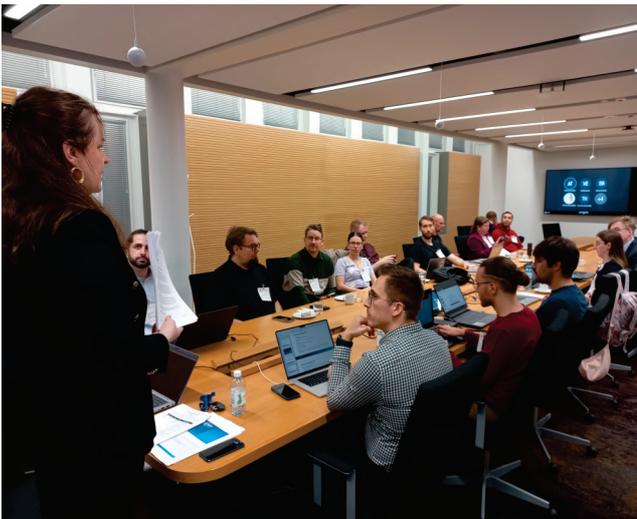


HORIZON EUROPE

TENSOR has been co-funded by the European Commission under Horizon Europe, the EU Framework Programme for Research and Innovation, under Grant Agreement 101073920.



TENSOR's 2nd Pilot Iterations Successfully Concluded in Oct, 2025



From July 2025 and the 5th Consortium meeting to early October 2025, the 2nd pilot iterations phase took place and was marked with success!

Use Case 1 in Czech Republic, Use Case 2 in Finland and Use Case 3 in Portugal and Moldova, attracted altogether more than 119 volunteer participants all eager to offer their insights in TENSOR's matured technologies.

Real-world testing is the cornerstone of developing effective and trustworthy biometric technologies. By applying

our solutions in real-life scenarios, we ensure that they address practical challenges, meet high operational standards, and align with ethical and privacy considerations.

These demonstrations marked a major milestone for TENSOR validating, the efforts undertaken to improve the system from last year's first iteration and end-users the opportunity to interact once again with the system, gaining hands-on experience with the various solutions that compose the TENSOR platform in its final form.



Use Case 1: Evidence Collection at Police of the Czech Republic



In collaboration with the Police of the Czech Republic, TENSOR integrated biometric tools such as voice, gait, and face recognition, into evidence collection workflows during a two-day pilot demonstration event that took place during 7-8 October 2025. This approach improved the identification of suspects using audio-enabled CCTV footage, enabling law enforcement to operate with greater accuracy and efficiency.



By leveraging modern biometric technologies, TENSOR seeks to significantly improve the suspect identification process through evidence gathered at crime scenes, such as CCTV footage. By streamlining workflows and increasing identification accuracy, TENSOR enables law enforcement agencies across the EU to conduct investigations more efficiently and effectively.



The participants had the opportunity to experience the advancements of TENSOR platform from the previous iteration, validate them and provide valuable insights for enhancements.



Use Case 2: Transforming Digital Forensics in Finland



In collaboration with Finland's Ministry of the Interior (MOI), the second pilot phase of Use Case 2 was successfully conducted at the MOI premises in Helsinki on the 10th and 11th of September. The pilot focused on showcasing TENSOR's innovative solutions for identifying the owner of an orphan mobile device found at a crime scene. The event brought together 19 participants with diverse expertise in biometrics, law, data protection, information security, management, public administration, forensics, and crime investigation. Testing activities were carried out in small groups, allowing participants to fit sessions into their individual schedules and engage directly with the technical partners.

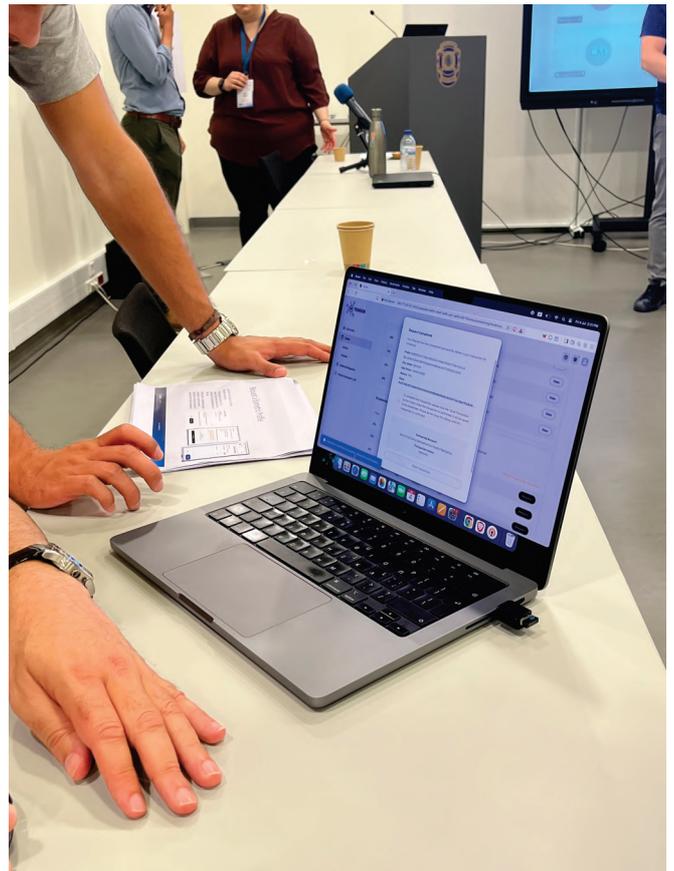
Throughout the two-day event, security practitioners took part in a series of interactive workshops and hands-on demonstrations that highlighted the technical components underpinning the Use Case 2 scenario. These practical sessions provided participants with a deep understanding of how each subsystem operates within the TENSOR platform. Following the demonstrations, engaging discussions encouraged participants to exchange viewpoints, ask questions, and contribute constructive feedback. Their input offered valuable insights that will support future improvements and ensure that TENSOR's tools continue to meet the operational needs of end-users across the security domain.



Use Case 3:

Securing Cross-Border Collaboration in Portugal & Moldova

TENSOR's Biometrics Dataspace at the premises of the Polícia Judiciária (PJ) on July 4th, 2025. Law enforcement participants worked through realistic investigative scenarios, gaining practical experience in secure biometric data exchange while complying with privacy and legal requirements. With support from technical teams, PJ representatives successfully identified a suspect using data from the General Police Inspectorate (GPI) of the Republic of Moldova, highlighting the platform's effectiveness for cross-border investigations. The demonstration confirmed the strong potential of data space technologies to enhance secure and trusted international cooperation.



A follow-up pilot took place in Moldova on 15–16 September using a hybrid setup, with technical partners providing remote presentations and support. Feedback from the Lisbon session informed improvements, including a streamlined local onboarding process. The pilot involved ten volunteer groups of five participants each, covering diverse operational contexts. Participants included judicial experts in biometrics and IT, police academy forensic science students, and criminal investigation officers, enabling a comprehensive evaluation of the platform.



Publications and Scientific Outputs

Over the last months TENSOR consortium partners have proceeded in additional 3 scientific publications!

- Liu, Dazhuang, Rui Wang, Kaitai Liang, and Georgios Smaragdakis. '**LADDER: Multi-objective Backdoor Attack via Evolutionary Algorithm**'. Network and Distributed System Security (NDSS), 2025
- Xu, Peng, Tingting Rao, Wei Wang, Zhaojun Lu, and Kaitai Liang. 2025. "**Power of Union: Federated Honey Password Vaults Against Differential Attack.**" Computers & Security 157 (July): 104592.
- Miniadou, Kyriaki, Eirini Kyriakou, Asterios Leonidis, Maria Korozi, and Constantine Stephanidis. "**A User-Centered Interface Enabling Secure Multimodal Biometric Search in Cross-Border Law Enforcement Operations.**" Paper presented at HCII 2025, Institute of Computer Science, Foundation for Research and Technology-Hellas, Heraklion, Crete, Greece, 2025.

Visit our website to explore more scientific outputs:

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Participation in events & conferences

ENFSI RDSC – News from the Lab workshop

Location: Online

Date: 22 September 2025

We are proud to announce that our consortium partner, ZITiS, has presented in ENFSI RDSC providing full details about the project and TENSOR Platform components, including insights from the published Joint Report of TENSOR as a result of the 2nd FCT&BM workshop. The session sparked interest and further content was requested for TENSOR to be featured in ENFSI newsletter on December 2025 and to be disseminated to all 72 organisations that are members of ENFSI.

European Association for Biometrics EAB Research Projects Conference (EAB-RPC 2025)

Location: Darmstadt, Germany

Date: 23-24 September 2025

For the third consecutive year, the TENSOR project was presented at the European Association for Biometrics EAB Research Projects Conference 2025. The conference featured keynotes from experts, including Dr Uwe Seidel (BKA), Ricardo Neisse (Frontex), C. Maxine Most (Acuity Market Intelligence), and Giulio Maria Mancini (European Commission, DG HOME), alongside presentations from innovative EU-funded projects such as TENSOR, ODYSSEUS project, EINSTEIN Project, NCI-ABIS, PRIVIDEMA Horizon Europe project 101167964, FF4ALL (Fondazione SERICS), IAMI Project, and ATHENE Center, as well as insights from our featured speakers, Wojciech Wodo (Identt) and Patrick Grother (NIST). TENSOR's advancements and findings were showcased focusing on age estimation by IDEMIA and gait recognition by FSAS Technologies – a Fujitsu company. Both topics sparked strong interest and lively discussion. For age estimation, questions focused on performance with minors and potential use in border management cases. For gait recognition, the audience raised points on accuracy and differences in performance across genders.





EABxCERIS: Biometrics in Action for Border Management & Fight Against Crime and Terrorism

Location: Darmstadt, Germany

Date: 23-24 September 2025.

TENSOR recently attended the EABxCERIS: Biometrics in Action for Border Management & Fight Against Crime and Terrorism. This event was a valuable opportunity to exchange insights with leading experts in biometrics, border security and digital identity. This event has also connected TENSOR with other EU projects such as EURMARS, CarMen, PopEye, IMPULSE and others oriented in security and identity research.



National Agency of Research and Development (ANCD) Horizon EU Event

Location: Moldova

Date: September 2025

The General Police Inspectorate (GPI) participated in an event organized by ANCD dedicated to Horizon Europe-funded projects, attended by researchers, institutions, and representatives from the European Commission and the EU Delegation. During the event, GPI presented the TENSOR project, focusing on the development and piloting of biometric technologies to support law enforcement in combating terrorism and organized crime. The participation provided an opportunity to share progress, exchange best practices, and strengthen collaboration with international partners in the field of public security innovation.





Data Privacy & Protection Conference 2025

Location: Athens, Greece

Date: 12 December 2025

SquareDev, participated in this conference with particular interest on in relevant TENSOR perspectives regarding processes of sensitive biometric information. AI was part of most of the discussions and a very important part of the conference was the EU AI Act and data protection in conjunction with AI. TENSOR prioritises privacy-by-design and ethical governance, and the conference offered the opportunity of staying updated on regulatory and policy developments. Alex Karvounis and Megaklis Vasilakis, members of Squaredev, had a chance to discuss with participants and promote TENSOR.



Digital Economy Forum 2025

Location: Athens, Greece

Date: 15 December 2025



The forum included sessions on digital transformation, artificial intelligence, cybersecurity, and public-sector digital infrastructures. Participants and event speakers ranged from private AI companies to the Chief of the Hellenic National Defence General Staff, the Minister of development and other high-ranking officials from the public and defence sector. These areas overlap with several horizontal aspects of TENSOR, particularly regarding AI-driven technologies, societal implications of digital systems, and the broader innovation ecosystem in which biometric and forensic solutions operate.

Stavros Theocharis, Head of Artificial Intelligence at Squaredev, participated as a panellist in a session regarding AI. He had the chance to discuss and share the experience of SQD regarding AI in Innovation Action programs and research activities, among other experiences. Along with Alex Karvounis, they had a chance to promote the work of SQD, as well as the TENSOR project.



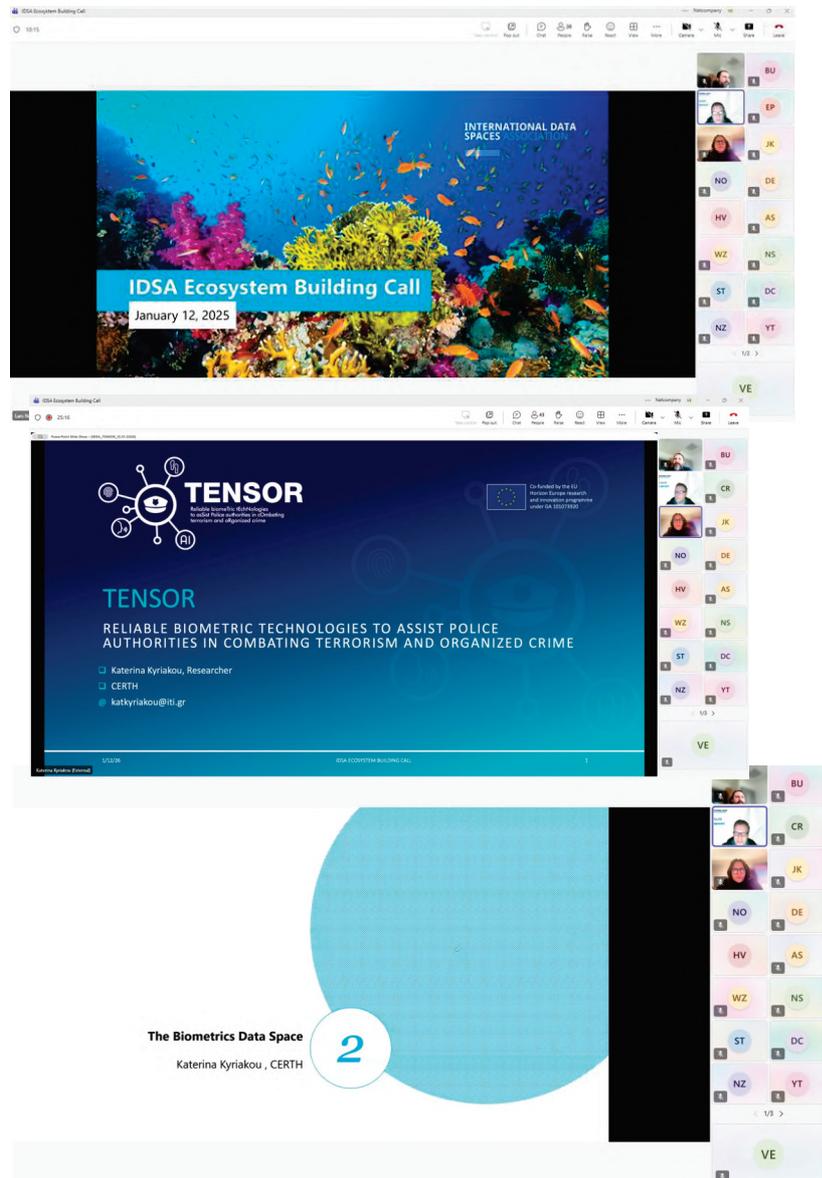
International Data Spaces Association (IDSA) Ecosystem Building Call

Location: Online

Date: 12 January 2026

The TENSOR project and its Biometrics Data Space were presented at the International Data Spaces Association (IDSA) Ecosystem Building Call, a weekly, business- and strategy-oriented forum bringing together IDSA members to present data spaces, use cases, and data-sharing initiatives, exchange best practices, and discuss the latest developments in the global data spaces ecosystem. During the Ecosystem Building Call held on Monday, 12 January 2026, with 44 IDSA members attending online from across Europe and beyond, Katerina Kyriakou from CERTH, one of the first organizations to join IDSA, presented the TENSOR project with a focus on the Biometrics Data Space framework.

The presentation provided an overview of the project's objectives and use cases, while highlighting the novelty and challenges of applying the data spaces paradigm to biometric data, which requires enhanced data protection. In alignment with IDSA principles, it detailed the data-sharing workflow and the adoption of IDS standards and components to support secure, interoperable, and sovereign data sharing. The presentation triggered several insightful questions, mainly related to the exploitation and sustainability of the Biometrics Data Space beyond the project's lifetime. Discussions covered its potential extension to additional Law Enforcement Authorities (LEAs), the role of open-source components for dissemination, regulatory compliance with EU frameworks, and alignment with the latest IDSA Data Space Protocol developments. Notably, interest was expressed in exploring a possible follow-up collaboration based on the presented use case.





TENSOR Final Conference

Location: Athens, Greece

Date: 5 December 2025

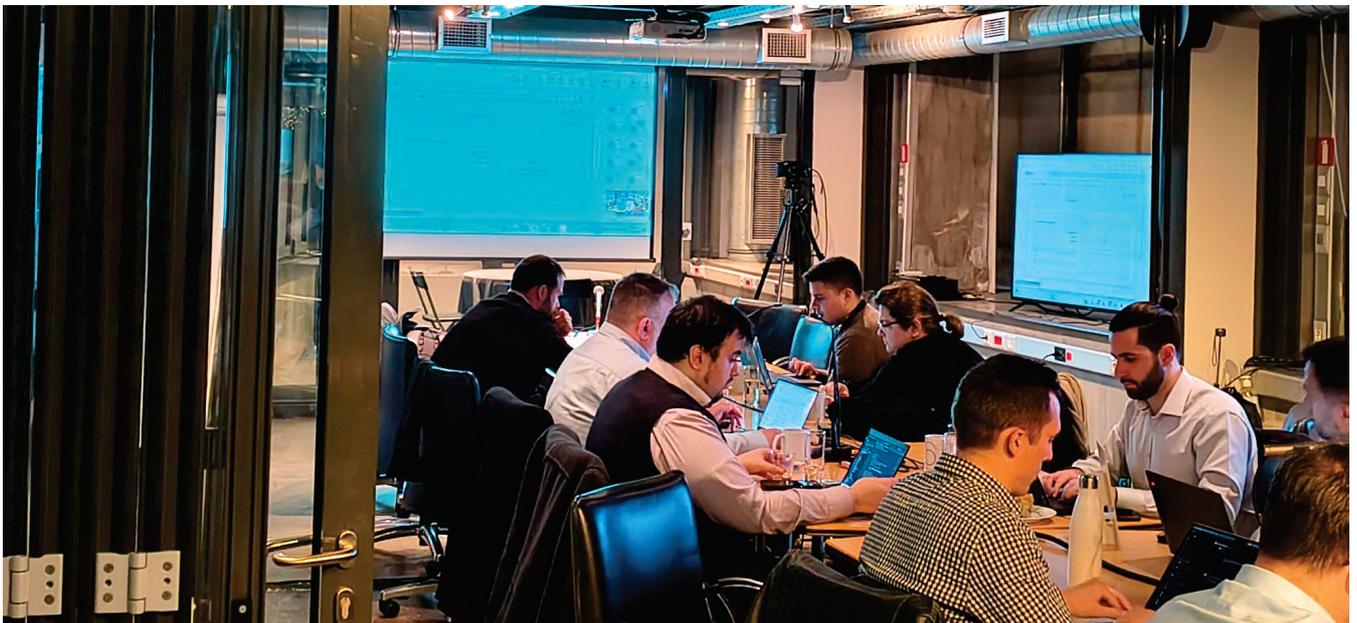
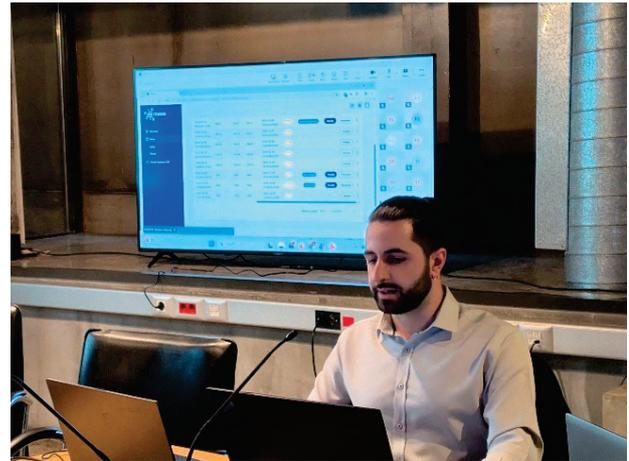
TENSOR project successfully held its Final Conference on December 5th, 2025, in Athens Greece. This full day hybrid event brought together more than 50 participants representing not only TENSOR project but also 9 EU funded projects, fostering a unique Horizon Europe Cluster 3 Session for the second half of the agenda activities!



TENSOR project's Coordinator, Eleni Veroni (Netcompany), opened the proceedings with a welcome and a brief overview, followed by a detailed technical presentation from the Technical Coordinator, Apostolos Apostolaras (CERTH) on TENSOR's architecture, advancements, and key outcomes of the implementation strategies.



A live demonstration based on TENSOR's Pilot Scenarios, Use Case 1, Use Case 2 and Use Case 3 followed, led by Netcompany, CERTH and FORTH. This session showcased the practical application of TENSOR Platform including, evidence collection intelligence derived from physiological and behavioural biometrics based on CCTV footage, digital forensic extensions from orphan devices, cross LEA dataspace searches and secure biometric data exchange in cross-border scenarios. Consortium partner's experts, Anastasios Nikolakopoulos (Netcompany), Nikos Gousetis (Netcompany), Katerina Kyriakou (CERTH) and Kyriaki Miniadou (FORTH) guided the attendees step-by-step familiarizing them with an end-to-end TENSOR Platform experience.





A dedicated session on ethics and compliance, presented by Mariana Carvajal (ETICAS), addressed key challenges in security research, sparking lively discussions among participants and EU projects.

Pilot leader ZITiS represented by Dennis Wolf, alongside Helinä Tiura-Virta (Finnish Ministry of Interior), Alina Nitrean (General Police Inspectorate of the Republic of Moldova), João Ribeiro, (Polícia Judiciária) and Pavel Kolář (Police Presidium of the Czech Republic) shared their experience as TENSOR's end users, providing their operational insights, emphasizing TENSOR's value in real-world environments.



A highlight of the event was the interactive session “Cross-Project Reflections & Discussion”, bringing together ten EU-funded projects to exchange insights following an in-depth presentation of TENSOR. The discussion focused on shared challenges in security and biometric technologies, revealing strong alignment across projects on issues such as data acquisition, interoperability, bureaucracy, and privacy constraints.

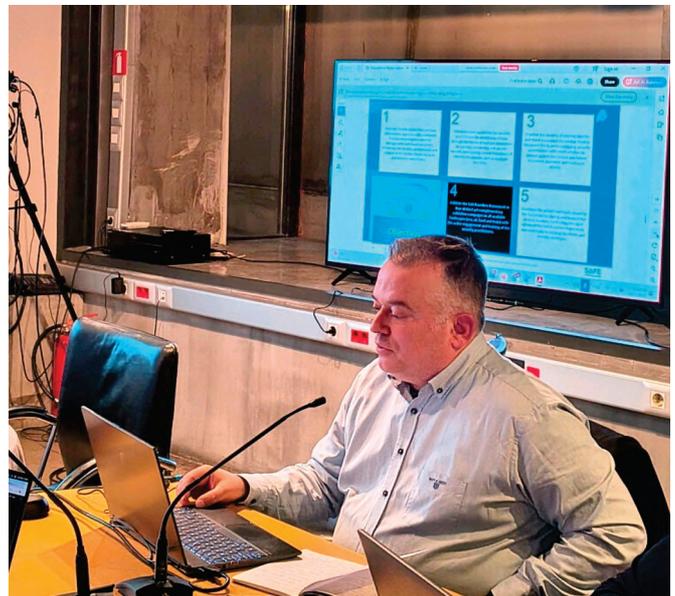
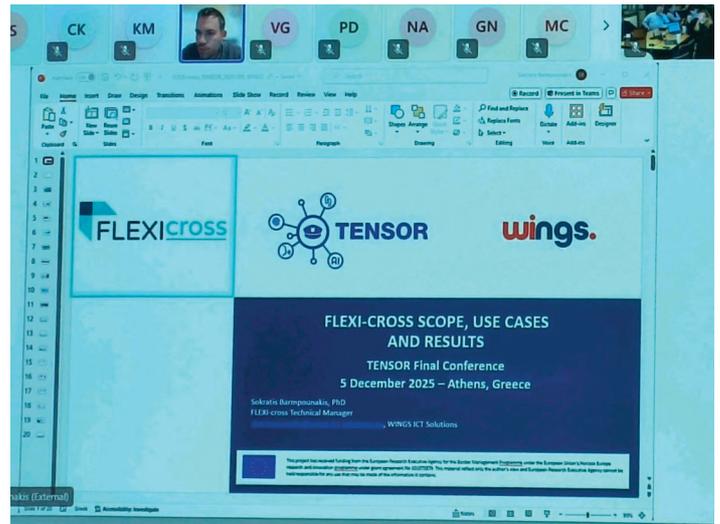
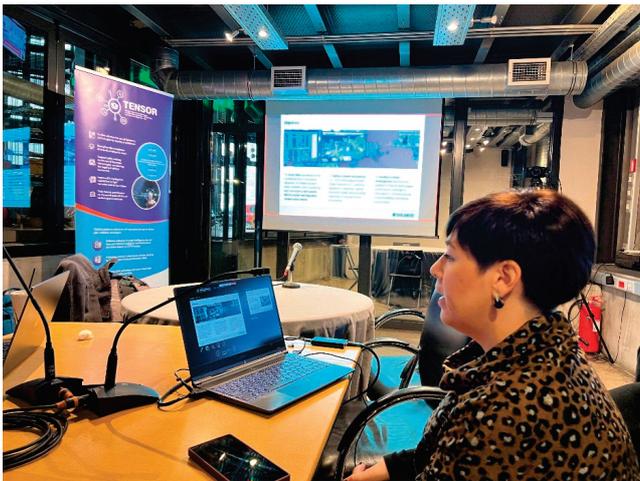
Participants explored promising synergies, including multi-modal biometrics, dataspace fusion, and advanced privacy tools like homomorphic encryption and blockchain. The dialogue underscored the need for shared infrastructures and stronger standardization efforts at the EU level, reinforcing the commitment to future collaboration under Cluster 3 research.

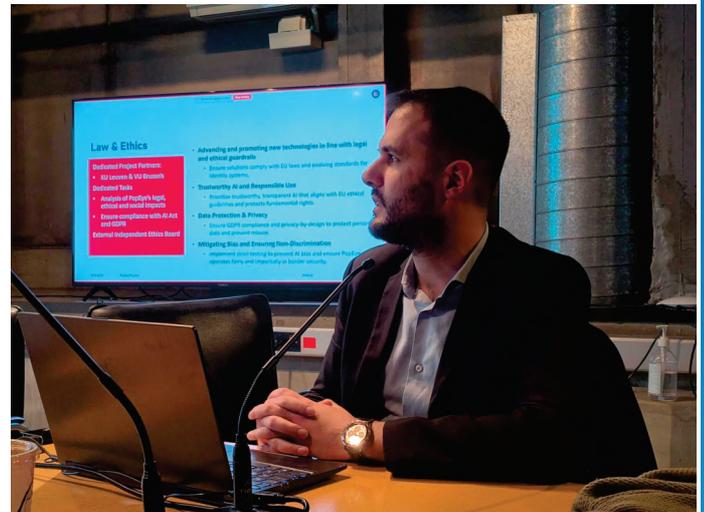
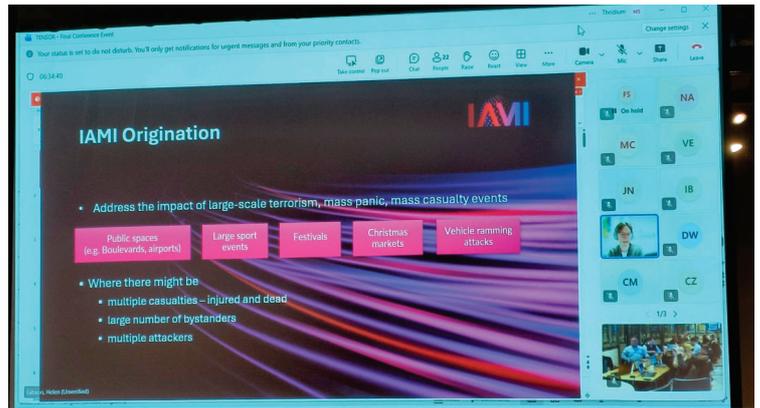


We are thrilled and honored that 9 EU funded projects under Cluster 3 accepted our invitation and joined TENSOR Final Conference!

This special clustering session brought together experts and researchers from **AVALANCHE, FLEXI-cross, ODYSSEUS, SafeTravellers, AutoBorder, IAMI, EINSTEIN, PopEye** and **ARMADILLO** to further discuss topics related to security, biometrics and identity verification, each one presenting their own perspectives, valuable experience, making this session remarkably insightful.

We extend our heartfelt appreciation to all representatives, for joining our activities and making this day a truly remarkable one!







TENSOR's Key Exploitable Results in Horizon Results Platform

TENSOR delivers three flagship Key Exploitable Results (KERs) that turn cutting-edge biometric research into practical tools for real investigations. Together, they help European law enforcement and forensic experts work faster, share data more securely, and build stronger, court-ready digital evidence. **Visit TENSOR website to find out more!**



KER 1: TENSOR Multi-Modal Biometric Identification Platform

The TENSOR Platform, a multimodal biometric identification and investigation system validated in realistic law enforcement scenarios.

The platform integrates traditional biometrics, including fingerprints and facial recognition, with emerging modalities such as voice, gait and behavioural biometrics. A fusion engine combines and dynamically weights biometric evidence based on context, data quality and investigator input, producing transparent confidence scores within a human-in-the-loop decision framework. The platform includes explainable AI, natural language interaction, and automated investigative reporting, reducing analytical complexity and supporting decision-making.



KER 2: TENSOR Biometrics Data Space

TENSOR Biometrics Data Space delivers a privacy-preserving solution that enables cross-border biometric searches without sharing or centralizing raw data. It allows law enforcement and forensic authorities to securely query distributed biometric repositories, using encryption and usage controls that preserve data sovereignty and comply with GDPR and EU legal frameworks.



KER 3: Behavioural Biometrics Identification Engine

Quadible provides law enforcement agencies with a pioneering AI-driven behavioural identification platform that attributes "orphan devices" to suspects by analyzing unique patterns like typing rhythm and touchscreen gestures. This forensic-grade, GDPR-compliant tool turns passive digital signals into supporting actionable evidence, supplementing traditional biometrics to accelerate forensic investigations.



Thank you for your continued support!

Stay tuned for more updates on TENSOR's transformative journey in the realm of biometrics technologies for seamless identification and identity verification.

For any inquiries or feedback, please feel free to reach out to us at

info@tensor-horizon.eu.

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TENSOR is co-funded by the EU Horizon Europe research and innovation programme under GA 101073920