This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No740754
THE VICTORIA PROJECT IN A NUTSHELL

- EUROPEAN Project: H2020 Secure Societies programme
- Managed by the Research Executive Agency of the European Commission
- The topic: SEC-12-FCT-2016-2017: Technologies for prevention, investigation and mitigation in the context of fight against crime and terrorism
- 3 year project (1 May 2017 – 30 April 2020)
- 5 007 125 € in funding
- 14 partners from 7 countries
THE VIDEO DILEMMA

- Videos are very useful for Law Enforcement Agencies (LEAs) criminal and terrorist legal investigations.

- Amount of video data continuously increases.

- Time: a precious factor for LEAs.

- Exhaustivity/Accuracy: required for a complete judicial procedure.

- *Merah Case (2012)*: 35TB of video footages collected, 10,000 hours of recordings to analyse => 2 person-years.

- Need for efficient tools assisting LEAs in their daily video investigation tasks.
VIDEO ANALYTICS TOOLS

- Video analytics: a core technology for these tools…
- ...but only efficient in controlled environment with current TRL
- In LEA’s world, video environment conditions vary a lot!
- Need for analytics robust to camera characteristics, image quality, viewing angles, moving cameras, etc.
WHAT IS MISSING?

- Few investigation tools available: usually vendor-closed systems, error prone and counterproductive

- Innovation in video investigation tools remains limited

- No real commercial/existing products widely used by the LEAs community

- Lack of representative data needed for R&D

- Need for VICTORIA!
THE PROJECT AND ITS CHALLENGES

The main challenge is to develop technologies that meet the real operational needs of the end users (LEA investigators):

- **Operational scenarios**: 6 operational scenarios, representative of legal investigations: environment, events / persons / objects have been selected,

- **Analytic tools**: the video analytics to be developed are selected according to these operational scenarios, in order to be able to detect all targets,

- **Ground truth data video production**: a set of real and synthetic videos with ground truth data are produced to serve as reference for the developments and tests.

Moreover:

- **Creation of the Community of video-analysis-for-investigation (VAFI) experts**: An on-line platform is provided for hosting professional communities related to research and innovation domain: [https://www.victoria-project.eu/](https://www.victoria-project.eu/)
OBJECTIVES & EXPECTED RESULTS

- Develop a robust and accurate TRL-6 video analysis technology that will boost the LEAs' video investigation capacity.
- Increase significantly the usability of video analysis tools for legal investigations.
- **Sustainability:** Create a business model and ecosystem allowing the video investigation field to grow and prosper.
- **Train** LEA investigators in the use of advanced video investigation tools.
- Ensure that the VICTORIA tools are in line with EU Legal-Ethical-Privacy rules including GDPR (General Data Protection Rules, May 2018).
HIGH-LEVEL VICTORIA PLATFORM CONCEPT

IN
Massive video input:
- Multiple formats
- Camera metadata

Fully customizable, e.g. I18N, adaptation to specific legal environment

OUT
Investigation Reports

Additional Analytics (software / server)
LEA databases

VIDEO INGESTION MODULE
VIDEO and METADATA STORE
VIDEO ANALYTICS ENGINE
INTERFACE to EXTERNAL REGISTERS
ADMIN & REPORTING

USER INTERFACES
4D RECONSTRUCTION

Big data video processing
To manage huge quantities of video recordings and process analytics, LEAs need a Video Analysis Platform (VAP), with search capabilities, visualization and case management to simplify analysis.

Based on queries and filters, enrich investigations during the whole analysis by sending new queries on the basis of previous queries.

Administrative functions: logging, database administration, backups, hardware and storage supervision.

Manage all the different tasks of a video analysis: video integration, indexing and synchronization, visualization and reporting.

PROJECT TOPIC: USER SPECIFICATION & REFERENCE DATA

VICTORIA VAP

CASE MANAGEMENT

ADMINISTRATION

INVESTIGATION
SOFTWARE ARCHITECTURE

Software Architecture

**PROJECT TOPIC:**
**TECHNICAL ARCHITECTURE**

- **VMS:** Video Management System

![Diagram](attachment:image.png)

* **VMS:** Video Management System
PROJECT TOPIC: TECHNICAL ARCHITECTURE

- Hardware Architecture
Detection, tracking, representation and context of:

- Generic Objects
- Persons and Objects Related to Persons
- Vehicle Detection

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Audio Analysis, Indexing and Synchronization

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Computational Optimization and Parallelization
PROJECT TOPIC: 4D CRIME SCENE RECONSTRUCTION

- **First step (3D):**
  Reconstruction of a target area in 3D (or similar to 3D) given the video recordings available in this area.
Second step (4D):
Adding time to a 3D reconstruction to get a spatial-temporal context of the scene.
PROJECT TOPIC: VICTORIA Training
Installation of a one VICTORIA Video Analysis Platform (VAP) prototype at the premises of each of the four LEA partners and the assessment of the VAP on real world data.

LEAs trained staff, will use the VAPs with real world video data.

The LEA investigators will record their results, feedbacks and observations during the demonstrations. All technical partners will provide support during the trials and demonstrations, depending on questions or concerns raised by the LEAs investigators.
PROJECT TOPIC: ETHICAL, LEGAL & SOCIETAL ISSUES:
14 organisations, 7 countries

- France
- Austria
- Germany
- Spain
- Belgium
- United Kingdom
- Romania

**Industries:**
- IDEMIA (FR)
- THA (FR)

**Academic partners:**
- AIT (AT) UKO (DE)
- IRIT (FR) UPV (SP)
- FHG (DE) KUL (BE)

**LEAs:**
- FMI (FR) MIR (SP)
- UKH (UK) SPP (RO)

**SMEs:**
- ART (FR)
- MZL (FR)
## THE CONSORTIUM

<table>
<thead>
<tr>
<th>ORGANISATIONS</th>
<th>COUNTRY</th>
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<tbody>
<tr>
<td>IDEMIA Identity &amp; Security France (Formerly Safran Identity &amp; Security)</td>
<td>France</td>
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<tr>
<td>Thales Communications &amp; Security SAS</td>
<td>France</td>
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<td>AIT Austrian Institute of Technology GmbH</td>
<td>Austria</td>
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<td>Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.</td>
<td>Germany</td>
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<td>Université Toulouse III-Paul Sabatier</td>
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<td>KU Leuven</td>
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<td>University of Konstanz</td>
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<td>Ministère de l’Intérieur</td>
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<td>Spain</td>
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<td>Serviciul de Protectie si Paza</td>
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<td>MANZALAB</td>
<td>France</td>
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THE VICTORIA ADVISORY BOARD (VAB)

- The VICTORIA advisory board (VAB) will have the task of:
  - advising the Consortium
  - providing an independent Peer Review mechanism with regard to the project progress and plans
  - Continuous feedback throughout the project
    - Receiving input on requirements, constraints and future needs, in complement to those exposed by the Victoria partners
    - Providing feedback to the proposed solutions and contribute to the assessment of the usage cases.
  - Meet when there are any face-to-face meeting
## THE VICTORIA ADVISORY BOARD (VAB)

To be updated during the project lifetime

<table>
<thead>
<tr>
<th>ORGANISATION</th>
<th>DOMAIN OF EXPERTISE</th>
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<tbody>
<tr>
<td>BKA (FEDERAL CRIMINAL POLICE OFFICE OF GERMANY)</td>
<td>LEA user needs in video investigation</td>
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<tr>
<td>CITY OF NICE, FRANCE</td>
<td>End-user needs in video investigation</td>
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<tr>
<td>EUROJUST, THE NETHERLANDS</td>
<td>Data protection</td>
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<tr>
<td>EUROPOL, THE NETHERLANDS</td>
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<tr>
<td>NFI (NETHERLANDS FORENSIC INSTITUTE)</td>
<td>LEA user needs in video investigation</td>
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<tr>
<td>POLICE OF TURIN, ITALY</td>
<td>LEA user needs in video investigation</td>
</tr>
<tr>
<td>SERVICIUL DE PROTECȚIE ȘI PAZĂ, ROMANIA</td>
<td>Security Advisor / handling of sensitive project information</td>
</tr>
<tr>
<td>UNIVERSITY OF SZEGED - INSTITUTE OF INFORMATICS, HUNGARY</td>
<td>Image/video analytics</td>
</tr>
<tr>
<td>UNIVERSITY OF THE AEGEAN, GREECE</td>
<td>Legal issues</td>
</tr>
<tr>
<td>UNIVERSITY POLITEHNICA OF BUCHAREST, ROMANIA</td>
<td>Video investigation</td>
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</table>
PROJECT DISSEMINATION ACTIVITIES

- **Creation of an on-line community of video-analysis-for-investigation (VAFI) experts:**
  The place to meet for VAFI experts: end-users, suppliers, researchers and developers.
  [https://www.victoria-project.eu/join-the-victoria-community/](https://www.victoria-project.eu/join-the-victoria-community/)

- **Launching of the VICTORIA Analytics Contest:**
  VICTORIA will create visibility of the video investigation research field and create awareness of the specific needs.
  **3rd Year of the Project:** VICTORIA Analytics Contest Event.

- **End of the 3rd Year:** VICTORIA final event.
PROJECT DISSEMINATION ACTIVITIES

STAY TUNED!

www.victoria-project.eu

@H2020Victoria

https://www.linkedin.com/groups/12091342

https://www.victoria-project.eu/join-the-victoria-community
Thank you for your attention! Any questions?
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victoria-coordination@eurtd.com