

ictLab



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About us

- iCTLab was founded in 2016 as a spin-off of the University of Catania through the collaboration of the three founders.



Prof. Sebastiano Battiato

Founder & Scientific Advisor



Dr. Antonino Paratore

Founder & Digital Forensics Expert



Dr. Oliver Giudice

Founder

- OUR MISSION

iCTLab was founded with the awareness that professional services must be provided by **specialised professionals**, with a great predisposition about **future and innovation**.

Our team

Our team is **multidisciplinary** and combines scientific and technological expertise to mutually **improve** workflows



1 Scientific Advisor

Strategic guidance and specialized advice to ensure scientific rigor in every project



2 Digital Forensics Experts

Specialists in the recovery and analysis of digital evidence with certified and cutting-edge methodologies



8 Multimedia Analytics (di cui 2 Ph.D)

Experts dedicated to Research and Development, as well as to the creation of innovative solutions based on Artificial Intelligence with a particular focus on Computer Vision and Advanced Multimedia Analysis



3 Administration, HR and Communications

Integrated management of business processes, human resources and internal and external communication

iCTLab's Business lines

The **Digital Forensics** business line focuses on solving cases using cutting-edge technology to ensure thorough investigations and aims to **revolutionize forensic practices**.



The **Multimedia Analytics** business line includes the company's **R&D** division, which creates innovative products and software while excelling in the field of **A.I.**



IctLab

Digital Forensics

Device Analysis

Event Reconstruction

Data Recovery



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Digital Forensics

We detect, analyse, reconstruct and resolve.



We work with **prosecutors, lawyers** and **private individuals** providing forensic consultings to solve highly complex cases.



We use **innovative methodologies** and **state-of-the-art technology** to analyse crime scenes and to not overlook any potential evidence.



We reconstruct cases by exploring **millions of unknown possibilities** and re-enacting every detail in specially generated **3D environments**.



Forensic Analysis Services

Concerned about privacy, need to verify media authenticity, or recover data from blurred footage? We can help.



**Multimedia
Contents**



Devices



**Events
Reconstruction**



Web Data

Case Study: Uncertainty Simulation

Reconstructing the dynamics of an accident through multiple simulations

Client

Public prosecutor's office

The Case

An elderly lady is run over by a car while crossing the street.

Examined Evidences

Assessment of the impact points found on the car, the braking crawls on the asphalt together with the fractures sustained by the victim.

Findings

Following the reconstruction of the three-dimensional scenario of the locations, a series of simulations were carried out, trying to replicate all the unknown variables from the few certain variables. The ultimate aim was to understand whether the actors involved in the accident had adequate visibility and reciprocal speed to avoid the accident.



Case Study: Projectile Trajectory Reconstruction

Examination aimed at determining the moment of the shot, resulting in the identification of the projectile trajectory.

The Case

Analyze the position of Subject 1 at the time of firing at Subject 2 and determine whether the trajectory is direct or indirect.

Examined Evidence

Evaluation of video material contained in a usb drive and extracted from the surveillance cameras of a commercial activity.

Techniques adopted

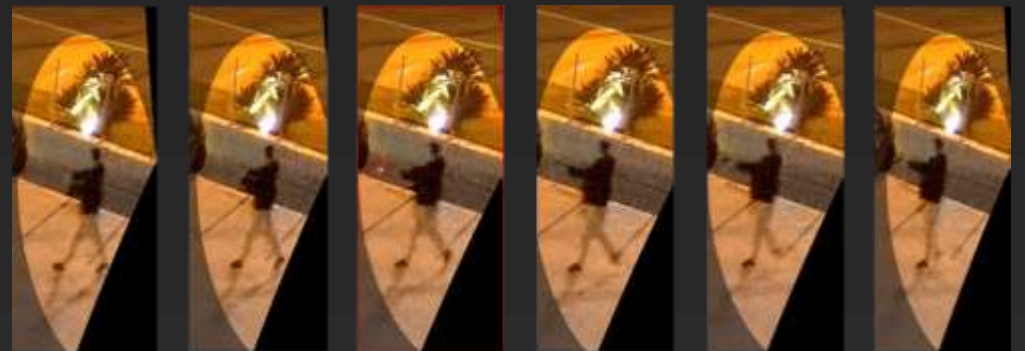
Video frames improvement through Amped Five software.

Findings

From the video sequence, the most significant frames were extracted, and through the Amped Five software, it was possible to enhance and the moment of the shot.

Analyses conducted on the improved frames revealed that the aiming line and the angle of the arm of subject 1 were not directly aimed towards subject 2.

Considering the positions of the two subjects involved, it was observed that the shooter's arm angle relative to the body of subject 2 and the aiming line were oriented towards the ground, causing the bullet to ricochet.



4301

4303

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4307

Case Study: Camouflage pattern recognition of a shoe

The case

Verification of the compatibility of texture and design of the shoes worn by subjects filmed in two videos recorded at separate times.

Types of analysis

Visual analysis of videos, use of filters and enhancements through Amped Five software, analysis of image pixels.

Evidence to be examined

Evaluation of videos obtained from two surveillance cameras. The review of the videos made it possible to identify subjects with camouflage shoes. In the first video, one of the two uncovered subjects wears shoes with camouflage print. In the second video, a hooded man wears similar shoes. A comparison of the shoes was made.

After the identification of the subjects, it was possible to recognize the brand of the shoes as "Adidas" thanks to the unique details.

Conclusions

The company has confirmed the uniqueness of the model, ruling out the possibility of producing two pairs with identical textures. The evidence indicates a high compatibility between the shoes, supporting the hypothesis that they belonged to the same individual taken at two different times.





IctLab

Multimedia Analytics

Machine Vision
Audio Processing
Image Analysis



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Multimedia Analytics

Multimedia has no secret for us.



We provide innovative products based on our **Artificial Intelligence**.



We are actively involved in **Research and Development** through collaboration with UniCT and other research institutions.



We process multimedia files of any **type** and in any **size**, easily cataloguing them thanks to our A.I.





VisuAlize

Turn visual data into **action**, from urban monitoring to industrial safety

VisuAlize is a **video-aware AI assistant** that analyzes video streams in real time, offering actionable insights via a conversational interface, acting as a watchful and intelligent eye.



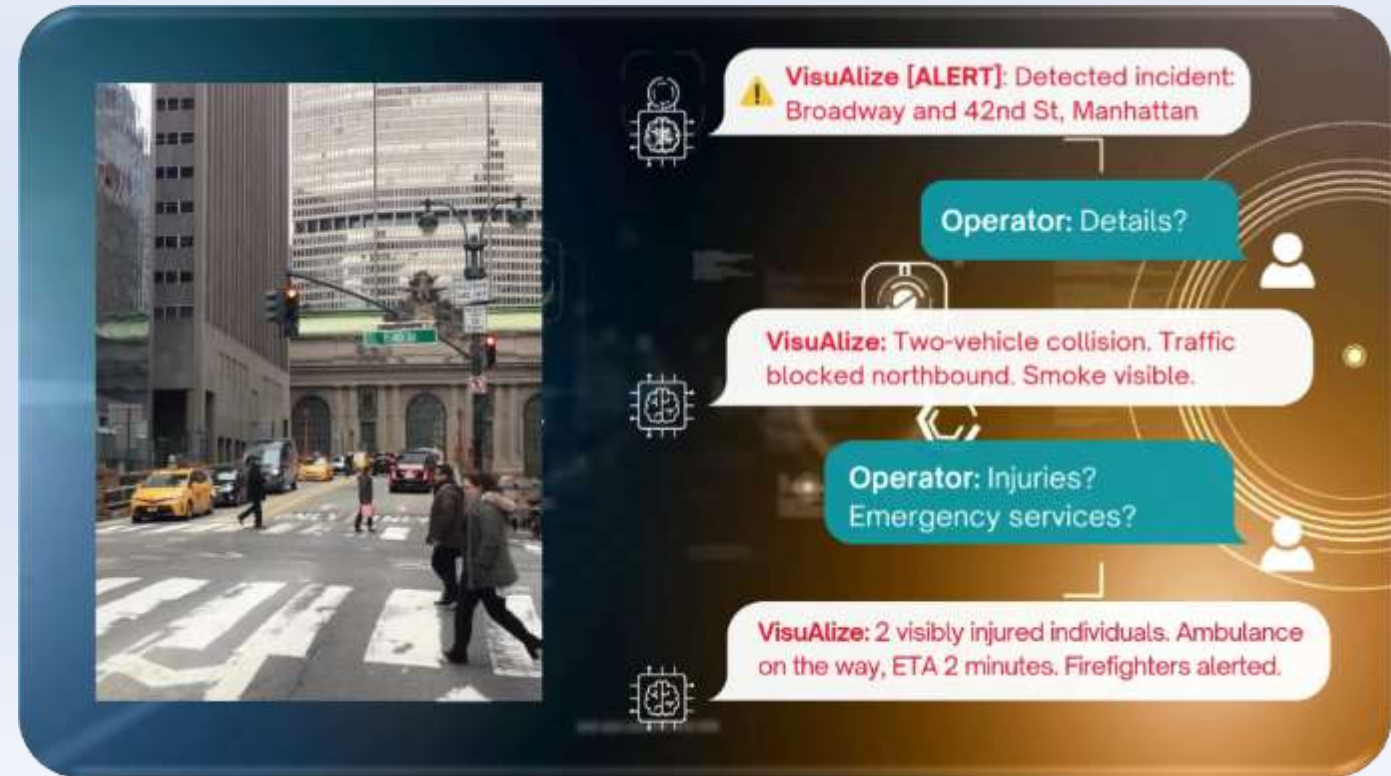
Real-time **analysis** of video streams



Intuitive conversational **interface**



Insights actionable for **data-driven** decisions





Lexlcon

Boost efficiency, **reduce** errors, **free** up time for high-value tasks

Lexlcon is an AI chatbot that answers complex questions in **natural language**, offering **precise answers** with timely quotes, acting as a tireless contributor.



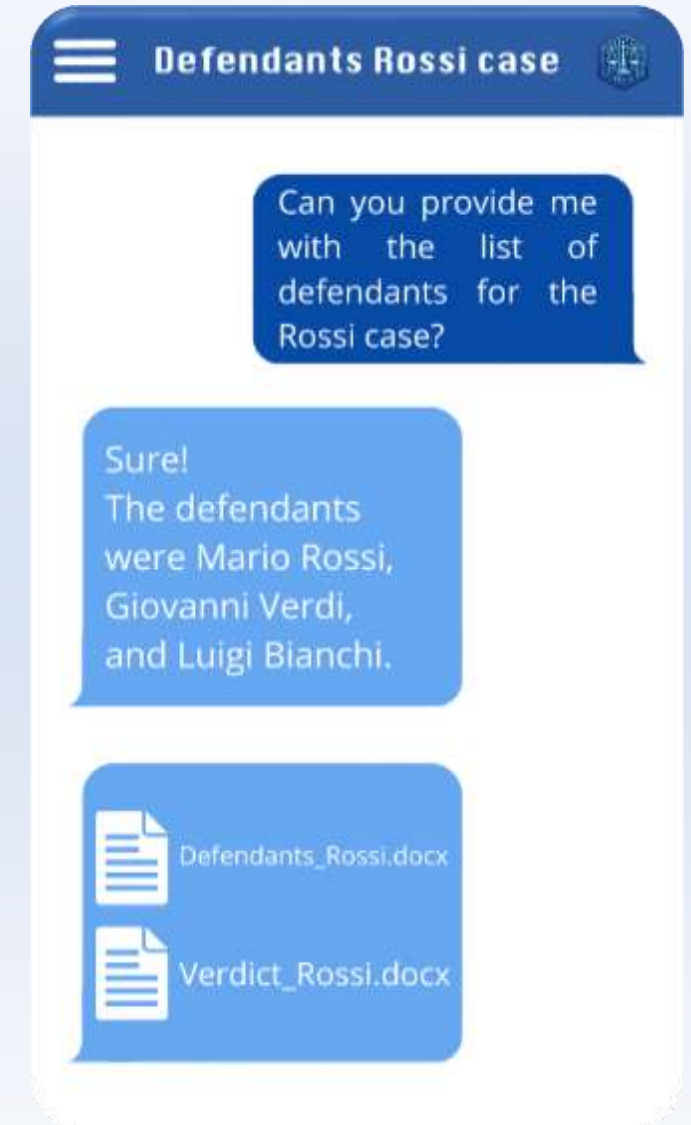
Rapid analysis of **vast data stores**



Precise answers to **complex** questions



Customized **strategy** recommendations





Our A.I. in continuous evolution

A circular button with a blue gradient and a subtle circuit pattern. The word "Clean" is written in a bold, white, sans-serif font in the center.

Clean

TO GET CLARITY
The AI for cleaning and
improving your content

A circular button with a teal gradient and a subtle circuit pattern. The word "Analyse" is written in a bold, white, sans-serif font in the center.

Analyse

TO EXTRACT
The AI to analyze your
contents

A circular button with a light blue gradient and a subtle circuit pattern. The word "Verify" is written in a bold, white, sans-serif font in the center.

Verify

TO TRUST
The AI to verify potentially
fake content

A circular button with a purple gradient and a subtle circuit pattern. The word "Explore" is written in a bold, white, sans-serif font in the center.

Explore

TO DISCOVER
The AI to explore and
find insights in big
databases

CAVE: 4 actions to extract value from multimedia data of
every **size** and for every **need**.



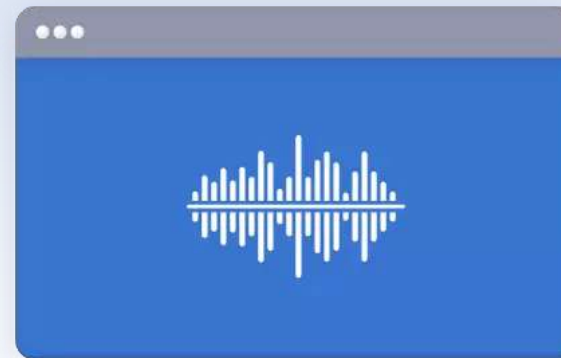
Our A.I. in continuous evolution

Clean is a customizable AI-powered suite for **multimedia enhancement**.

Its integration combines photo **noise removal**, video **stabilization**, and audio background noise **elimination**. This comprehensive toolset operates within a single platform.



Original Audio



A.I. Cleaned Audio



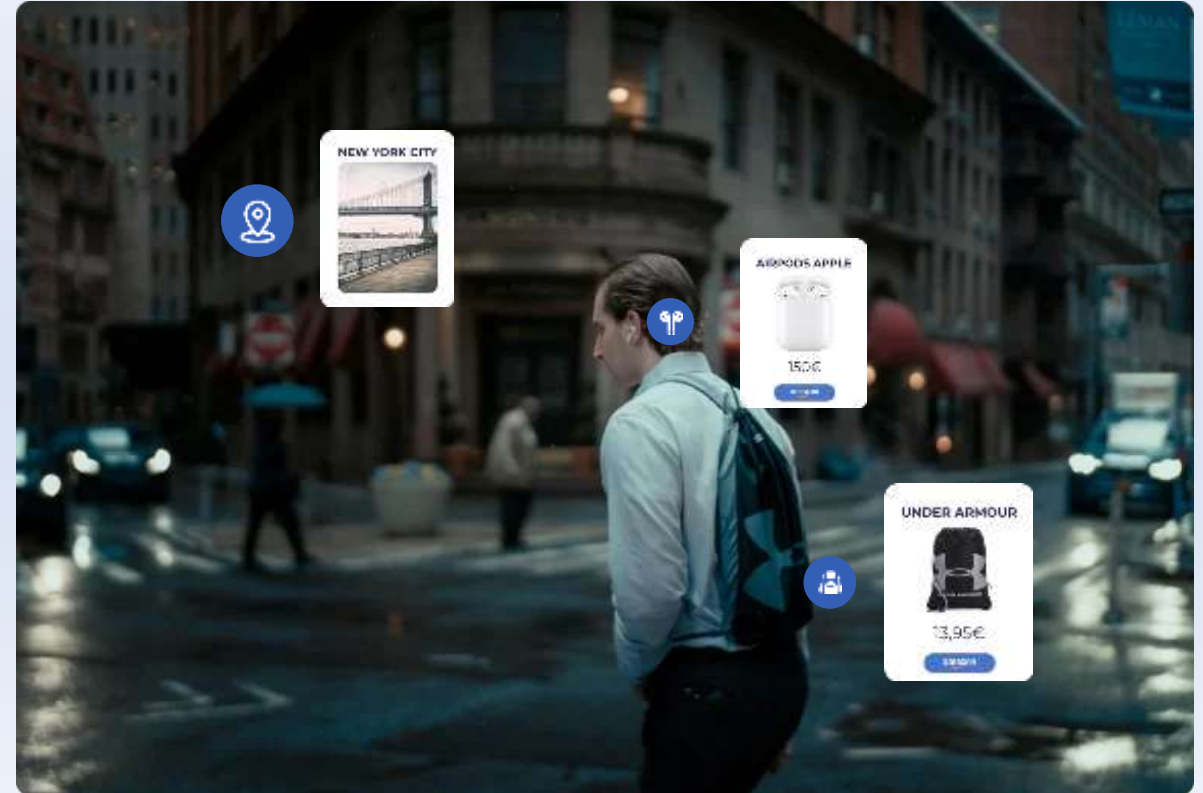


Our A.I. in continuous evolution



Analyse allows you to extract structured data from your media content enabling new application solutions.

Implement it easily on your media files and display extra information suitable for any purpose: location, marketing, subject identification.





Our A.I. in continuous evolution



Verify is the suite that analyses multimedia content to assess its authenticity and provenance, whether it is a news video, the content of a message or a suspicious voice recording.

Verifying the authenticity of such data is crucial to ensure the security of a country, a company or an individual.

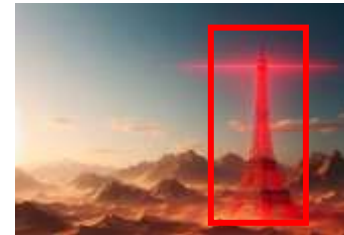
Audio

Analyze audio tracks with two or more speakers and identify their age or gender and certify the recording authenticity.



Images

Dispel any doubt about an image that seems tampered. Observe, locate and remove any feature that should not be portrayed in that photo.



Video

Verify a potentially fake video that depicts a public figure, a friend or an acquaintance. Avoid fraud and phishing attempts perpetrated through deepfake.



Deepfake Detection System



Aware of the constant evolution of **deepfake generation** techniques, Prof. Sebastiano Battiato and the iCTLab team have been dedicating themselves for years to cutting-edge research on state-of-the-art **deepfake detection** methodologies, developing innovative solutions to ensure the security and authenticity of multimedia content.

Example of Deepfake Detection



Here some scientific papers about the topic:

- Guarnera, L., Giudice, O., & Battiato, S. (2020). Deepfake detection by analyzing convolutional traces. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition workshops* (pp. 666-667).
- Guarnera, L., Giudice, O., Nießner, M., & Battiato, S. (2022). On the exploitation of deepfake model recognition. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 61-70).
- Casu, M., Guarnera, L., Caponnetto, P., & Battiato, S. (2024). GenAI mirage: The impostor bias and the deepfake detection challenge in the era of artificial illusions. *Forensic Science International: Digital Investigation*, 50, 301795.

Deepfake Detection System



Years of research in the field of Deepfake Detection have led iCTLab to accumulate experience and develop specific solutions for identifying false audio, videos, and images.



Deepfake and
fake Audio detection



Processing

Analysis Results:

Video output: **FAKE**

Audio output: **Authentic**

Log:

FakeDetect has detected that the following video call has a **91.2%** probability of being a **deepfake**.

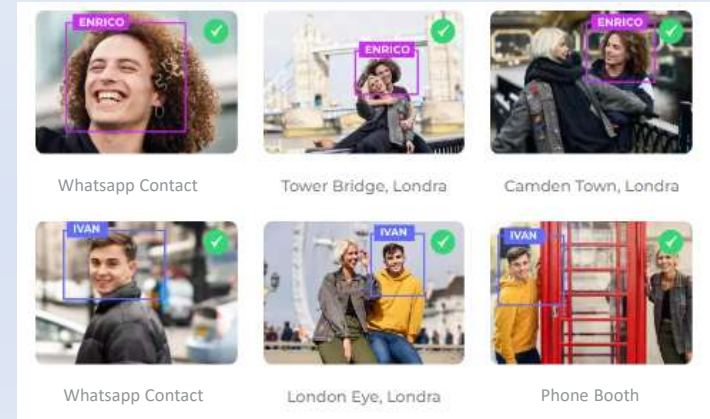
The speaker's voice has a **2.1%** probability of being fake.

EXPLORE allows you to easily find insights within large databases.

Big data is also **useless** data if I don't know how to find what I need.

Thanks to Explore's **advanced tools**, you can find information in large databases simply by asking common questions.

Who was I with in London in 2017?



100%

Research Results: In 2017 you were in London with Enrico and Ivan

How we operate

and define the goals to choose the best methods for helping you.

1. We need a group of photos, videos or audio files

We don't need it to be catalogued, we just need your request!



2. Our specialists will use the best algorithms

to create a new module for automated decision-making that will be used for your case.



3. When ready, your module will be integrated

in your workflow, your management software or inside our dedicated Multimedia Analytics platform.



Cy4Gate: Image Analysis

Automatically analyze images for automatic captioning and tagging

Request

Need to automatically analyze and categorize large volumes of images according to specific criteria.

Our solution

We have developed an AI system that combines two modules to:

- Image Captioning: Automatic description of the image content.
- Custom Tagging: Labeling based on a custom taxonomy.

Image Input



AI Processing



Output

Caption: Smiling arab man in the desert drinking from a white cup

Tags:

- Man
- Arab
- Desert

Xenia: Smart Digitalisation

Advanced scanning and browsing of digitalized documents



Request

Digitalize scanned paper documents, link footer references with body text, and build a content-based knowledge graph.

Our solution

Development of an AI system for:

1. Intelligent Digitization:

- Convert scans to digital text.
- Automatic linking of footnotes with the main text.

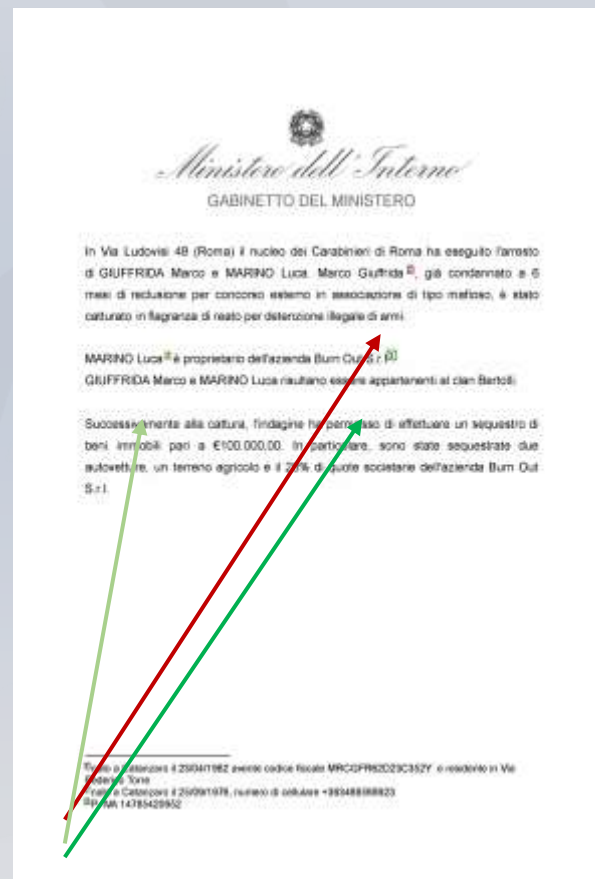
2. Creating a Knowledge Graph:

- Performing a Named Entity Recognition (NER)
- Linking entities to form a knowledge graph

Xenia: Smart Digitalisation

Advanced scanning and browsing of digitalized documents

Digitalization



Enhanced result

In Via Ludovisi 48 (Roma) il nucleo dei Carabinieri di Roma ha eseguito l'arresto di GIUFFRIDA Marco e MARINO Luca. Marco Giuffrida [nato a Catanzaro il 23/04/1962 avente codice fiscale MRCGFR62D23C352Y e residente in Via Federico Torre], già condannato a 6 mesi di reclusione per concorso esterno in associazione di tipo mafioso, è stato catturato in flagranza di reato per detenzione illegale di armi. MARINO Luca [nato a Catanzaro il 25/09/1976, numero di cellulare +393468568923] è proprietario dell'azienda Burn Out S.r.l [P. IVA 14785420952] 3. GIUFFRIDA Marco e MARINO Luca risultano essere appartenenti al clan Bertolli. Successivamente alla cattura, l'indagine ha permesso di effettuare un sequestro di beni immobili pari a €100.000,00. In particolare, sono state sequestrate due autovetture, un terreno agricolo e il 20% di quote societarie dell'azienda Burn Out S.r.l.

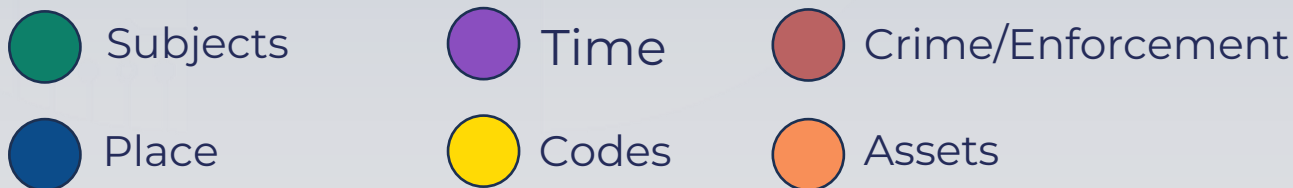
Xenia: Smart Digitalisation

Advanced scanning and browsing of digitalized documents



Knowledge graph construction

GABINETTO DEL MINISTERO [Ente o Autorità 1.0] In Via Ludovica 48 (Roma) [Luogo Specifico Nota 1.0] il nucleo [Ente o Autorità 1.0] dei Carabinieri [Ente o Autorità 1.0] di Roma [Area Geografica 1.0] ha eseguito l' arresto [Provvedimento 1.0] di GIUFFRIDA Marco [Soggetto Fisico 1.0] e MARINO Luca [Soggetto Fisico 1.0] . Marco Giuffrida [Soggetto Fisico 1.0] [nato a Catanzaro [Area Geografica 1.0] il 23/04/1962 [Riferimento Temporale Specifico 1.0] avente codice fiscale MRCGFR62D23C352Y [Codice Fiscale 1.0] e residente in Via Federico Torre [Luogo Specifico Nota 1.0] , già condannato [sf:status_giuridico 1.0] a 6 mesi di reclusione [Pena 1.0] per concorso esterno in associazione di tipo mafioso [Titolo del Reato 1.0] , è stato catturato in flagranza di reato [Provvedimento 1.0] per detenzione illegale di armi [Titolo del Reato 1.0] . MARINO Luca [Soggetto Fisico 1.0] [nato a Catanzaro [Area Geografica 1.0] il 25/09/1976 [Riferimento Temporale Specifico 1.0] , numero di cellulare +393468568923 [Numero di Telefono 1.0]] ? è proprietario [sf:ruolo_qualifica 1.0] dell'azienda Burn Out S.r.l. [P_IVA [Soggetto Giuridico o Attività 1.0] 14785420952 [Partita Iva 1.0]] 3. GIUFFRIDA Marco [Soggetto Fisico 1.0] e MARINO Luca [Soggetto Fisico 1.0] risultano essere appartenenti al clan Bertolli [Associazione 1.0] . Successivamente alla cattura, l'indagine ha permesso di effettuare un sequestro di beni immobili [Bene Fisico 1.0] pari a €100.000,00 [Bene Patrimoniale 1.0] . In particolare, sono state sequestrate due autovetture [Bene Fisico 1.0] , un terreno agricolo [Bene Fisico 1.0] e il 20% di quote societarie [Bene Patrimoniale 1.0] dell'azienda Burn Out S.r.l. [Soggetto Giuridico o Attività 1.0]



Neodata: Automatised Video Analysis



Request

Automatically analyze long-form videos (such as entire movies), generate text descriptions and tags for each individual scene.

Our Solution

Development of a special AI system for:

- **Automatic segmentation** of the video in distinct scenes.
- For each scene:
 - Generation of **video captioning** (textual description of the content).
 - Creation of relevant **tags**.
 - Production of a detailed report scene by scene, combining captioning and tagging.

Video Input



AI Processing



Enhanced Output

Caption: A man and a woman cook various haute cuisine dishes in a quick succession of scenes.

Tags: man, woman, food, kitchen

Fides: Advanced audio comprehension



Request

A debt collection company needs to analyze large volumes of phone recordings to extract key information, assess call effectiveness, and understand customer sentiment, all while maintaining the security of sensitive data and ensuring real-time processing.

Our Solution

Scalable, LLM-based on-premise AI system for:

Specifications:

- **Real-time transcription** of phone recordings.
- **Summary of conversations** and classification of outcomes.
- **Sentiment analysis.**
- **Secure and compliant** data processing.
- **Distributed architecture** for high-volume management.
- **Autoscale** to handle peak loads.
- **Containerized microservices** for operational flexibility.
- **High availability and data security.**

Request

A marketing company needs to automatically verify that the videos produced by creators are congruent with the scripts provided, ensuring adherence to the established guidelines.

Our Solution

Development of a Multimodal Large Language Model (LLM)-based system to:

1. Analyze Simultaneously:

- Video produced by the creator.
- Original brief/script.

2. Generate comprehensive feedback that includes:

- Approval or non-approval evaluation.
- Detailed reasons for the decision.

3. Automate the review process, ensuring consistency and speed

CreationDose: Compliance Checker



Request

A marketing company needs to automatically verify that the videos produced by creators are congruent with the scripts provided, ensuring adherence to the established guidelines.

Input



Brief:

1. Show the outer packaging, highlighting the logo and key specifications.
2. Open the box, listing all the included accessories.
3. Take out the vacuum cleaner, emphasizing the compact and modern design.
4. Demonstrates the ease of mounting accessories.
5. Turn on the vacuum cleaner, highlighting the power and quietness.
6. Conclude by mentioning the competitive price and 2-year warranty.



**Multimodal
LLM**



Result: Not Approved

Reason: The video does not discuss the main specifications, does not highlight the compact design and accentuates the noise of the vacuum cleaner instead of its quietness.

INNOVA: Innovating Video Analytics

INNOVA is a European Digital Innovation Hub (EDIH) dedicated to spreading knowledge and the potential of video analysis.

The initiative aims to create an innovation ecosystem where public entities, companies, and communities can explore, understand, and adopt advanced video analysis solutions.

Through research, practical demonstrations, and networking activities, INNOVA fosters collaboration between industry experts and end users, to develop specific solutions that meet the specific needs of territories and user categories.

We collaborate with **public entities** (municipalities, ports, defense) **across Italy**, offering support in adopting digital technologies and promoting a sustainable digital transition, in line with the OECD Recommendations on Digital Government Strategies.



INNOVA: Partners



**Università
degli Studi
di Palermo**



9iCtLab



BV'TECH



axians



**MOTOROLA
SOLUTIONS**



iCTLab in numbers

2017

- First contact with CY4GATE
- Development of a Chatbot for Levi's
- iCTLab develops the first proprietary solution for Facial Recognition
- Consultations provided for Tony Drago's case

2016

iCTLab
Foundation



2018

- Partnership with CY4GATE confirmed
- Partnership with Moxoff
- Agreement achieved with MYAV s.p.a. for the realisation of



2020

- ReSolar
- Huge increase in forensic consultation requests
- Beginning of research for Deepfake Detection



2019

- ICTLab participates to SMAU in Milan and MakerFaire in Rome
- ICTLab First Rebrand

2021



- Collaboration with L&T



2023



-R-PODID-



- Launch of the KDT-ARCHIMEDES and KDT-R-PODID projects
- Participation in MakerFaire 2023



2025

TWINLOOP

- Launch of the TWIN-LOOP European project



2022



- Record turnover
- Projects with UNICT
- iCTLab patents the VR Ballistic Analysis System



2024

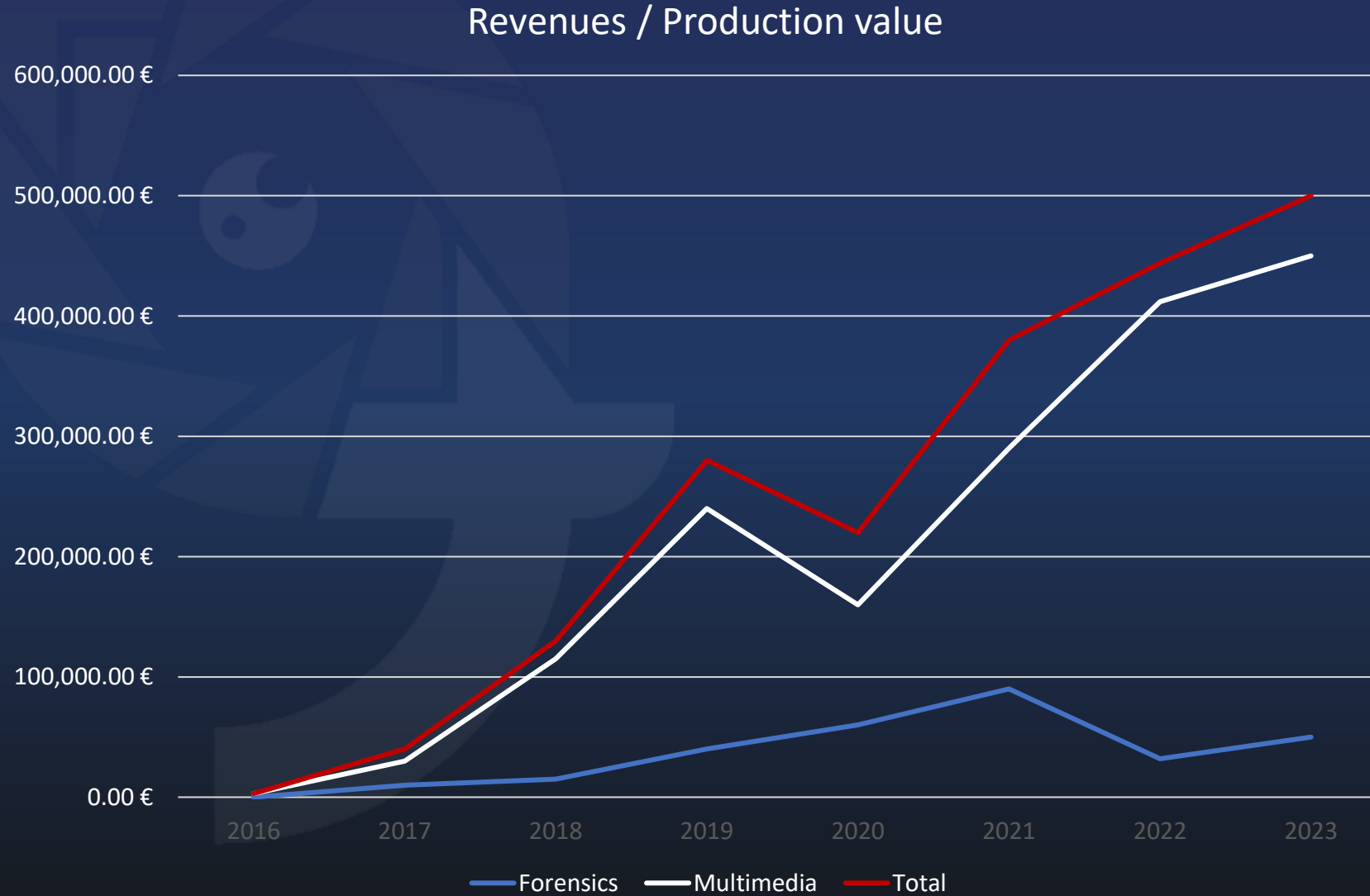
SMARTCITY
EXPO WORLD CONGRESS

INNOVA

- Patent for VR Ballistic Analysis System Officially Approved
- Participation in the SmartCity World Congress
- Launch of the INNOVA EDIH



iCTLab in numbers



EU AI Act ready

In compliance with the **EU AI Act**, we are rigorously ensuring that AI systems adhere to regulations, to subsequently release a **certification** of compliance to validate the **accordance** to these standards.

Our efforts are aimed at verifying the conformity of AI systems and their operations with the legal framework outlined in the AI Act.

We are committed to fostering **transparency**, **accountability**, and **ethical practices** within the artificial intelligence domain.



Events and Awards

In both 2021 and 2022, iCTLab was ranked in the **TOP 3** at the **Legal Tech Awards**, in which 80 legal-tech companies were evaluated on the basis of their economic-financial fundamentals, long-term growth potential and corporate income.

In 2024 iCTLab has been awarded with the “**Technological Innovation Award**” during the 6th Edition of the Forensics Awards



Events and Awards

Furthermore, iCTLab was included in the First Legal Tech Report by 4cLegal and Gruppo 24 Ore.

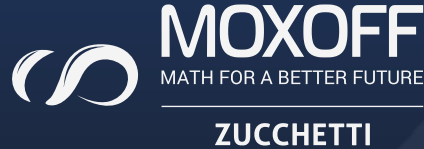
The report presented the **LexIcon**, **iOCR**, and **CAVE** solutions as innovative tools in Digital Forensics and Legal Tech, confirming our commitment to technological excellence in the legal sector.

[Link to the report](#)

4cLegal

GRUPPO 24 ORE

Our clients



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di Catania



Università di Foggia



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