

The ILEAnet scientific newsletter provides scientific news in the security research area. Published every two months, it is intended to highlight and promote the scientific work in the field of technology, human and social sciences. The scientific coordination within the ILEAnet project is led by Professor Patrick Laclémence. In this issue, you will find:

[NEWS: ILEANET STUDY ON AGE DETERMINATION TECHNIQUES](#)

Find out more about the second ILEAnet study

[PORTRAIT OF A PRACTITIONER ACTIVELY INVOLVED IN SECURITY RESEARCH](#)

Discover active profiles in security research

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Find here a selection of recent scientific and technical resources extracted from the Knowledge Factory on the main themes of the ILEAnet project

eDNA AS A POTENTIAL TOOL FOR FORENSICS?

ILEAnet Scientific Coordination Team

Earlier this year, it has been demonstrated that Environmental DNA (eDNA) can be collected from air and used to identify mammals. It was already known that we leave DNA all over the place, and water has been much studied, but we also shed DNA in the air.

In the proof of concept study led by researchers of the Queen Mary University of London, researchers successfully recovered naked mole-rat DNA in air samples, but they also detected human DNA in their samples, likely reflecting the use of the room by humans. Hence, the researchers suggested forensic applications as potential outputs of their research, as most air samples contained human DNA. By adapting the methodology, it could be possible to perform DNA profiling, even when no physical traces have been left, in a non-invasive way.



Naked mole-rat

For further information about the study, consult Clare EL, Economou CK, Faulkes CG, Gilbert JD, Bennett F, Drinkwater R, Littlefair JE. 2021. eDNAir: proof of concept that animal DNA can be collected from air sampling. PeerJ 9:e11030 <https://doi.org/10.7717/peerj.11030>

NEWS: ILEANET STUDY ON AGE DETERMINATION TECHNIQUES

ILEAnet's mission is to stimulate LEAs' capacities to influence, develop and take up research, development and innovation (RDI) in order to help them tackle their daily challenges. Therefore, the implication of research, academia and industry is crucial to fostering and developing innovative solutions. ILEAnet represents a unique community, bridging very different worlds, building up a portfolio of RDI results and concepts, and destined to generate recommendations for future policies at the European level.

ILEAnet developed an analysis of LEAs' challenges and needs, which highlighted a pressing challenge mentioned by ILEAnet's community of law enforcement practitioners: the **review and analysis of the age assessment techniques in the context of migration**.



As a result, ILEAnet's Consortium agreed on the necessity of a **state-of-the-art investigation** on the solutions used to perform age assessment. It would allow the research world to share its most recent and innovative solutions, with the purpose of finding concrete solutions to LEAs' needs.



After **a call for tenders at the European level**, the second ILEAnet study began on June 29, 2021. For 7 months, the selected contractor is in charge of **reviewing the existing and emerging age assessment techniques**, in order to provide a **classification of the solutions** according to a range of parameters (reliability, ease of use, legality & ethics, portability, speed, cost, etc.). The final report should consist in recommendations that can easily nurture the European Commission's future projects, strategies and possible efforts for standardisation.

The first tasks consisting in reviewing the existing and emerging techniques are ongoing.



Should you have any questions regarding the study, please contact ensp-ileanet@interieur.gouv.fr

PORTRAIT OF A PRACTITIONER ACTIVELY INVOLVED IN SECURITY RESEARCH

LORENZO RINALDI



Senior Police Officer

Degree in Physics, PhD in Remote Sensing

Head of one of the four Divisions of the Italian Forensics Science Police Service dealing with Electronic investigations, Firearms Ballistics, Gunshot Residues, 3D crime scene reconstruction using Virtual Reality (representing a team of about 90 people)

Chair of the eu-LISA advisory group for EURODAC

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The ILEAnet scientific coordination team met the new Italian INC (ILEAnet National Contact), Lorenzo Rinaldi, head of one of the four Divisions of the Italian Forensics Science Police Service. With strong scientific and technical backgrounds, he leads technical investigations and drives the technical development of his unit.

Could you tell us more about your professional career path?

I have a master degree in atmospheric Physics. I worked as physicist in international projects, performing many in-field campaigns to measure atmospheric components and to develop sensors detecting atmospheric particles, such as pollutants. My expertise in dynamic systems has proved to be very useful all along my career. Then, I successfully applied for a PhD in remote sensing area. Finally, after a tough competition due to the limited number of available positions, I had the chance to join the Italian Forensics Science Police.

What positions did you hold within the Italian Forensics Science Police?

I had various positions, always following the development of the biometrics. At the beginning I was in charge of the video and audio laboratory then, I moved to the fingerprint world and was in charge of the latent fingerprint sector. When the first migration crisis impacted Italy, I switched to “preventive identity” (mainly focused on the fingerprinting of migrants and asylum seekers). It was a very interesting field to work in because, at the same time, the EU was developing central systems (such as EURODAC and then SIS-AFIS) and fostering the cooperation of national databases and the increase in the exchange of fingerprints. I have also been responsible of the handwriting sector, another very interesting experience because there is a lot of physics and psychological parameters to study. Then, I started working on face recognition techniques. The forensics police is a very inspiring environment, with many experts who like the law enforcement applications!

What is your current position?

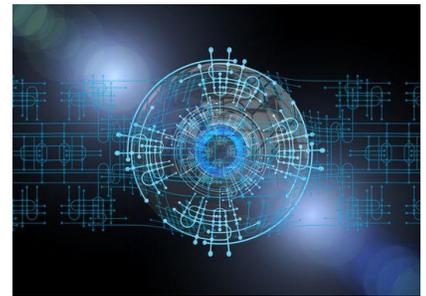
At present, I am responsible for the 4th Division of the Forensics Science Police which deals with lots of topics, ranging from electronic and ICT investigations, to ballistics and gun-shot residues analysis and 3D crime scene reconstruction. In the latest period, the main focus is, for sure, on face recognition and,

more generally, Artificial Intelligence applications for Law Enforcement purposes.

Since 2018, I am also the chair of the eu-LISA EURODAC advisory group, for the identification of applicants for international protection and third-country nationals irregularly crossing an EU external border.

What is the future of Forensics?

I am quite convinced that the challenge for Forensics in the next future is adopting Artificial Intelligence (AI). For examples, all IT systems I have been working on from 2004 are now approaching AI. I'm following the change both from a legal and technical points of view. The EU is working on an AI regulation, which will also deal with LEA applications, and it is a very challenging topic because an effective trade-off has to be found between LEAs' duties and the respect of fundamental rights. I am working on all the possibilities the AI may introduce in the field, such as data analytics. In this context, I am responsible of the Italian face recognition system used by National Police and its developments, and we are always checking for law-compliance, following the provisions of the national data protection authority.



What are your interactions with the security research area?

I have been involved in projects for a long time. Due to my scientific background, I currently drive the project activities of my unit. We are part of many projects, such as the EU Horizon 2020 [MAGNETO](#), an AI based project aiming to improve LEAs' capabilities for fighting and preventing crimes. The project is the result of a close collaboration between different Law Enforcement Agencies, Universities and Enterprises from all over EU. Having the end-user role in this project, first we helped in defining the technical requirements, then we provided guidelines for the management of the adoption of this new platform on LEAs' premises, and in the end we performed deep functional tests on the developed solutions on the basis of our specific use cases. In fact, the developed MAGNETO platform currently permits to analyse huge amounts of heterogeneous data coming from different sources, like CDRs, CCTV footages, text, mobile forensics extractions and other structured tables. The MAGNETO project is now having a wide resonance also among Institutions external to the original consortium, like Europol and other LEAs, confirming the relevance of the topic of I use in police activities.

How does your unit interact with academics and industrials?

As Forensics Science Police, we have many Memorandums of Understanding with academia. We collaborate, for instance with the University of Roma "La Sapienza", the University of Turin and the University of Rome "Tor Vergata", which has a skilled material analysis lab. Indeed, Academia can help us with statistical studies, concerning for instance the false hit/non-hit rates which are crucial when using a biometric technology for law enforcement applications, or with signal analysis on electronic devices. Let me add that some of our most talented employees are invited speakers in university courses, international events and specialist trainings (like CEPOL) so there are lots of opportunities to discuss and to be aware of what academics are doing.

Furthermore, we are in contact with major technology providers, who keep us informed about the latest development and products. Most of the time we collaborate with our providers by sending feedbacks related to the operational use of their products, which helps them in keeping up with our specific market needs. Indeed, the technology developed by industrials has to be customized to our needs, and this is often specified in the contract.

Whenever possible, we test technologies developed by universities and systems produced by private companies in operational conditions, so we can make choice among industry's new products. In this way, we are driving industrials' efforts in development.

Can ILEAnet facilitate the interaction with security stakeholders?

When I was appointed INC in February 2021, I have been contacted by many Italian researchers who were part of the project and we exchanged very interesting information about their labs and their work. And together with my team, we succeeded in connecting our network with other Law Enforcement experts which were still "missing". With researchers and LEAs, we are creating a network to exchange expertise and ideas and I appreciate it very much. And I do think we will have results from that, because it helps create a stimulating environment.



ILEAnet could represent the right place in which experts from private and public entities could openly discuss about the relevant issues and latest needs for the specific fields they are involved in. This is the kind of network that could help the specialised sectors of police forces grow and bring positive changes.

How to better make researchers, industrials and LEAs collaborate?

Forensics brought a major added value in the Italian National Police, by merging the technical and operational expertises. We represent a crucial interface with academia: we are their skilled counterparts in the police institution to talk with and it is a way for LEAs to be open to the external world. We have a role of "expert filter", we are an interface between industry, technology providers and the operational National Police. This role is important, recognized, and appreciated. And in research projects too, the "dialogue" between LEAs, academia and industry should be reflected. It also means that LEAs have a duty: investing in initial and continuous training, in order to be in the research loop!

How do you keep up to date with the scientific and technological news?

We subscribed to scientific journals. Even though they are usually more focused on activities than products, it is a way to know where research is going. Furthermore, we are involved in drafting scientific publications. Last year, we published a few articles and I would like to increase this number because it keeps my team up to date! We are about to publish an article about Taser guns. Newsletters are also key to relaying information about what other LEAs are doing and to start the dialogue between experts. They do not need to be as long as research articles published in international journals, so LEAs should definitely use that communication channel to exchange information about their research strands.

Thank you very much Lorenzo for your time and for this very interesting exchange! ILEAnet members can connect with Lorenzo through the [ILEAnet Online Platform](#) or by email.

KNOWLEDGE FACTORY DIGEST

The ILEAnet scientific coordination team provides here a selection of recent scientific and technical resources related to the main themes of the ILEAnet project: cybersecurity, terrorism, organised crime and migration. Resources can be found in the [ILEAnet Knowledge Factory](#). If you want to share a publication, please contact us at ensp-ileanet@interieur.gouv.fr

ILEAnet collects the most recent or relevant publications in the following areas, but does not necessarily endorse their contents.

Cybersecurity

Pawlicka Aleksandra, Choras Michal, Pawlicki Marek, *et al.* A \$10 million question and other cybersecurity-related ethical dilemmas amid the COVID-19 pandemic. Business Horizons 2021. In press. doi : <https://doi.org/10.1016/j.bushor.2021.07.010>

Wright David, Garstka Krzysztof, Kumar Richa. Rising to the proliferation of cybercrime challenging LEAs across Europe. European law enforcement research bulletin 08/2021; 21: 81-98. Available: <http://bulletin.cepol.europa.eu/index.php/bulletin>

Terrorism

Europol. Online Jihadist Propaganda : 2020 in Review
Europol. 2021. 48 pages. Available: <https://www.europol.europa.eu/publications-documents/online-jihadist-propaganda-2020-in-review>

Kelejian Harry H, Mukerji Purba. Causal factors of terrorist attacks on countries, and corresponding spill-overs between them. European journal of political economy 2021. In press. Doi : <https://doi.org/10.1016/j.ejpoleco.2021.102092>

Organised crime

Parrilla Marc, Slosse Amorn, Van Echelpoel Robin, *et al.* Portable Electrochemical Detection of Illicit Drugs in Smuggled Samples: Towards More Secure Borders. Chemistry proceedings 2021 ; 3 : 1-7. Available: <https://sciforum.net/manuscripts/10612/manuscript.pdf>

Pastor Raquel, Mognet Franck, Mattes Tobias, *et al.* COPKIT: Technology and Knowledge for Early Warning/Early Action-Led Policing in Fighting Organised Crime and Terrorism. In : Technology Development for Security Practitioners 2021. Springer. 2021. 121-133.

Migration

FRONTEX. Risk Analysis for 2021. FRONTEX. 2021. 66 pages. Available: <https://frontex.europa.eu/publications/frontex-releases-risk-analysis-for-2021-MmzGI0>

You may also be interested in the following reports or articles:

Artificial Intelligence

Apostolakis Konstantinos C, Dimitriou Nikolaos, Margetis George, *et al.* Improving situational awareness of European law enforcement agents through a combination of augmented reality and artificial intelligence solutions (Darlene project). *Open research Europe* 2021; 1 : 87-103. Available: <https://open-research-europe.ec.europa.eu/articles/1-87>

European Parliamentary Research Service, Dumbrava Costica. Artificial intelligence at EU borders: overview of applications and key issues. EPRS. 2021. 41 pages. Available: <https://op.europa.eu/fr/publication-detail/-/publication/a4c1940f-ef4a-11eb-a71c-01aa75ed71a1/language-en>

United Nations Interregional Crime and Justice Research Institute. Towards Responsible Artificial Intelligence Innovation - report for law enforcement. UNICRI. 2020. 56 pages. Available: <http://www.unicri.it/towards-responsible-artificial-intelligence-innovation>

CBRNE

Kolencik Marian. CBRN-E crime and offenders' motives. What is it? Why people do it? In press. doi : [10.13140/RG.2.2.11835.34083](https://doi.org/10.13140/RG.2.2.11835.34083)

Crowd violence

Gkountakos K, Ioannidis K, Tsikrika T, *et al.* Crowd Violence Detection from Video Footage *International Conference on Content-Based Multimedia Indexing (CBMI)*. 2021. 1-4. doi: <https://ieeexplore.ieee.org/document/9461921>

Domestic violence

Machado Paulo, Pais Lucia G, Morgado Sonia, *et al.* An Inter-Organisational Response to Domestic Violence - The pivotal role of police in Porto, Portugal. *European law enforcement research bulletin* 08/2021; 21: 141-150. Available: <http://bulletin.cepol.europa.eu/index.php/bulletin>

Drone

Enemark Christian. Armed Drones and Ethical Policing: Risk, Perception, and the Tele-Present Officer. *Criminal Justice Ethics* 2021; 40(2): 124-144. Doi : <https://www.tandfonline.com/doi/full/10.1080/0731129X.2021.1943844>

Fake news

Kirchknopf Armin, Slipecevic Djordje, Zeppelzauer Matthias. Multimodal Detection of Information Disorder from Social Media. *International Conference on Content-Based Multimedia Indexing (CBMI)*. 2021. 1-4. doi: [10.1109/CBMI50038.2021.9461898](https://doi.org/10.1109/CBMI50038.2021.9461898)

CONTACT



You wish to publish? You are a researcher and would like to share your profile?
You would like to have information about the ILEAnet project and the scientific
coordination? Do not hesitate to contact us!

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