

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:

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From research to the Law Enforcement field: the fight against the illicit trafficking of cultural property

By the ENSP team involved in the projects mentioned hereafter

The looting and trafficking of cultural property, including archaeological heritage, is a vector for the financing of terrorism and investigators need new means to fight it more effectively. Since 2015 and with the support of the OCBC (French office for the fight against trafficking in cultural property), the Research Centre of the French National Police Academy (CRENSP) has been involved in scientific research of operational interest in the field of illicit trafficking of cultural property.

The research started in 2016 with [POLAR](#) (Police and Archaeologists Against Antiquities Trafficking), a national project to strengthen cooperation between art professionals and law enforcement agencies. The H2020 [NETCHER](#) project (NETwork and digital platform for Cultural Heritage Enhancing and Rebuilding) built on POLAR results to develop an exchange platform of nearly 300 archaeologists and investigators from all over Europe. At the same time, a mobile tool for detecting stolen objects and identifying looted objects (*Arte-Fact*) has been developed in the H2020 [PREVISION](#) project. Leveraging its knowledge and expertise in the field, the CRENSP is now involved in new projects aiming at supporting the training of Middle East investigators ([FSPI AGIR](#)), developing efficient marking of archaeological items through nanotechnology (NOSE project- Novel security ink for archaeological artefacts marking, funded by the French National Research Agency) and raising awareness on illicit trafficking of cultural goods in the educational sector (PITCHER, Preventing illicit trafficking of cultural heritage: educational resources, a Erasmus+ project). Protecting cultural heritage is key to preserve collective memory and history, so this research will be continued.

PORTRAIT OF A RESEARCHER ACTIVELY INVOLVED IN SECURITY RESEARCH

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The ILEAnet scientific coordination team met Wolfgang Jentner, a research associate at the University of Konstanz (Germany). He has been involved in several research projects and is currently preparing his PhD in Visual Analytics.

Can you tell us more about you?

I am a research associate and PhD candidate at the [Data Analysis and Visualization Group](#) at the University of Konstanz. Our research group focuses on ‘Visual Analytics’, which aims at combining machine learning and artificial intelligence (AI) technologies with interactive visualizations. We integrate the users and their domain knowledge (i.e., their expertise) into the analysis process. My research pivots on exploratory analysis of structured data using pattern mining.

Could you recommend one or two of your papers, which may be of interest for law enforcement practitioners?

The first paper I can recommend is [Making Machine Intelligence Less Scary for Criminal Analysts: Reflections on Designing a Visual Comparative Case Analysis Tool](#). This paper focuses on the design and development of a prototype that can find similar crime reports based on the Modus Operandi text. Thanks to a short text describing the case, the tool can be used to find cases similar to a specific case, or also find trends in criminal activities (such as new tools being used by burglars).

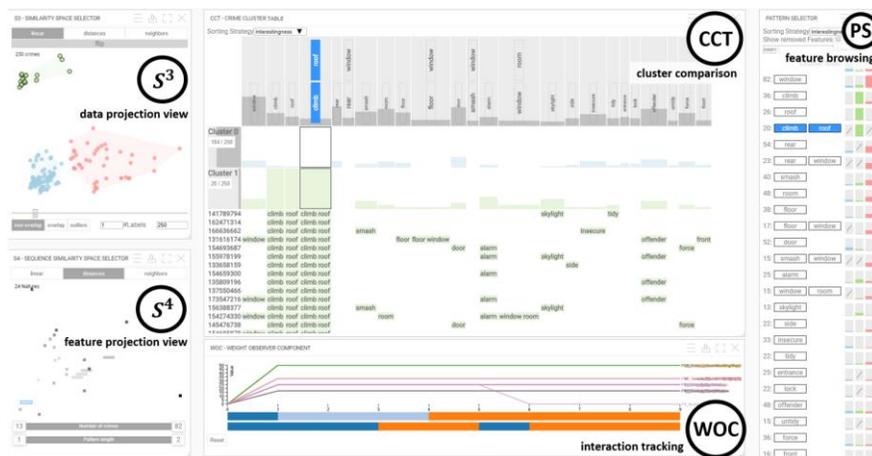
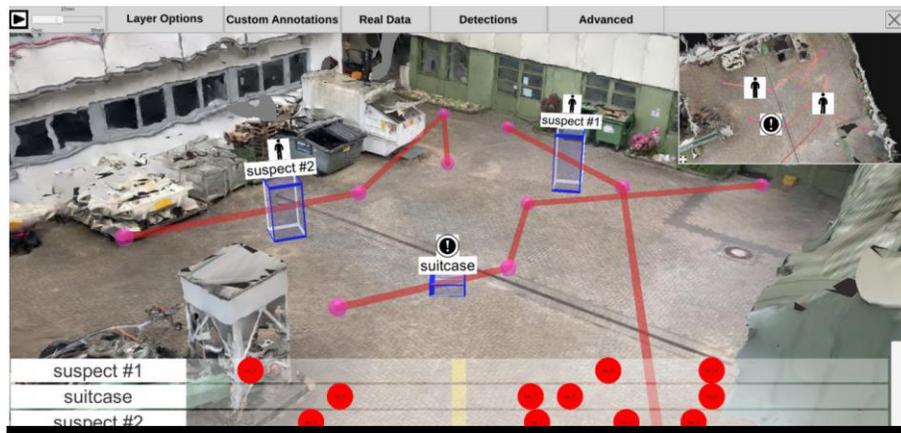


Figure 1: The Concept Explorer of the VALCRI project. The criminal investigator can find patterns in crime reports such as “climb roof”.

The second paper worth mentioning is: [Toward Mass Video Data Analysis: Interactive and Immersive 4D Scene Reconstruction](#). The described prototype allows criminal analysts to create a 4D scene (that is to say a 3D scene with a timeline) by simply using photo and video material of a crime scene. The

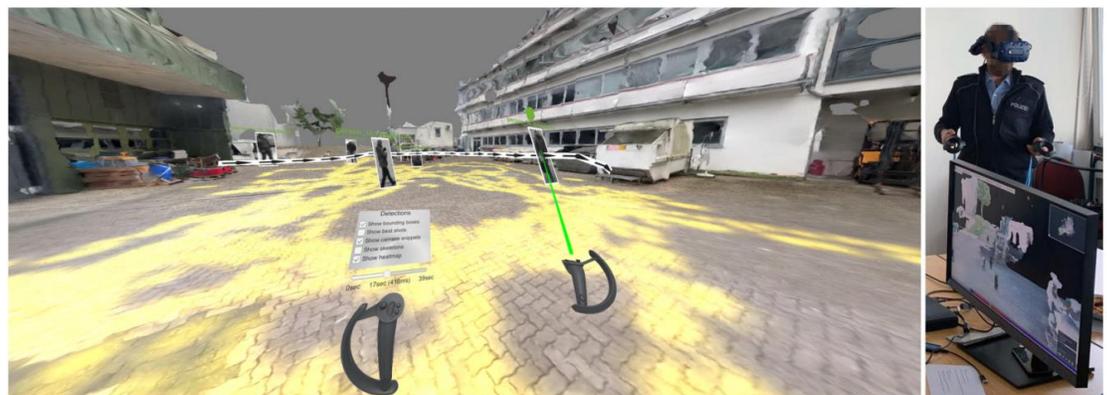


scene can then be animated to reconstruct the crime.

Virtual Reality can be used to put the user inside the crime scene, which is very resourceful for collaboration and also useful in court hearings. There is a [video on YouTube](#) showing and explaining the prototype.

Figure 2: The 3D scene can be annotated with objects and they can be animated using paths to reconstruct a crime (VICTORIA).

Figure 3: A law enforcement agent using virtual reality to immerse himself into the crime scene (VICTORIA).



You have been involved in several research projects. What do those collaborative projects bring to the Law Enforcement and research communities?

As a research associate I am heavily involved in EU and national projects, mainly in the civil security area. I was involved for instance in [VALCRI](#), [ASGARD](#), [VICTORIA](#) (all EU projects), as well as [FLORIDA](#), [PEGASUS](#), VIKING (national projects funded by BMBF, the German Federal Ministry of Education and Research). All these projects were conducted in collaboration with LEAs.

The advantage for LEAs to be involved in such national or European projects is to get in contact with people that work on state-of-the-art techniques. Furthermore, it allows them to shape these technologies towards their own needs. Even though this requires some involvement of the LEAs, it typically leads to much better outcomes than waiting for a commercial software developer to develop some tool, which will then be expected to fit perfectly into the LEAs workflow.

From our academic perspective, collaborative projects are helpful because researchers learn about real-world problems and sometimes even get to work with live data.

What is the impact of your research on LEA daily work?

It would be a lie to say that the prototypes we developed are already in daily use at the LEAs' premises. Our research is typically 3-5 years (or even more) ahead of what is being used in industry and as a daily tool for LEAs. One important aspect, however, is that the law enforcement practitioners understand what is possible AND where the limits are. For example, in the VALCRI project the criminal investigators joked that a "solve crime button" would be nice and save them a lot of time. Towards the end of the project, they understood how AI technologies can benefit their workflows and also where the shortcomings were. Most importantly, they learned that human expertise, steering, and decision making is inevitable. We went from an "AI Sherlock" that solves crimes on its own to an "AI Watson" that supports the user in their workflows but leaves critical decisions upon themselves when suggesting possible paths.

How do you perceive the future of your research area? What will be the impact of AI on Law Enforcement?

The future is bright as there is more and more data available and machine learning and artificial intelligence are necessary to handle these large amounts of data. Nevertheless, in law enforcement, the user must remain in control of these processes and must be included into the whole analysis process. Visual Analytics offers exactly this. It is always exciting to see the new emerging technologies from machine learning, human computer interaction (such as virtual reality, augmented reality), and finding new ways of combining these technologies using interactive visualizations to include the human in the process.

The EU strives to put rulebooks and checklists for transparent artificial intelligence systems together. I think this is quite essential to shape the future of AI in Europe, especially in law enforcement. AI, as every technology, can be exploited and misused. There are many cases of biased machine learning models, and transparent AI are one way to conquer this issue. This implies that the human remains in control and understands the decision processes of an AI and can intervene and steer at all times. The machine should not make critical decisions without the user.

What are the required skills to be a researcher?

One of the most important skills is the liaison between end-users, such as LEAs, and researchers. A common language has to be found that all participants feel comfortable with. We have written a paper about this aspect called "[Minions, Sheep, and Fruits: Metaphorical Narratives to Explain Artificial Intelligence and Build Trust.](#)"



Figure 4: A domain expert and a researcher find a common language through a metaphorical narrative. These narratives simplify complicated problems by using a simple and sometimes comical language to be more engaging.

Finding a common language also requires learning about the domain of each other, which is what I enjoy the most about our collaborations. These collaborations allow me to continue expanding my knowledge.

What can we do to improve the interactions between researchers and LEAs?

A good starting point is to have a common ground, meaning that the data should be as close as possible to what the LEAs are typically working with. This helps the users to better understand how this data is being processed. In my opinion, physical meetings are more effective to find a common language as they tend to be longer and involve social events such as dinners. I've experienced it a couple of times where the breakthrough in finding a common language and engagement happened during dinner rather than the official meeting. This is most likely due to the fact that such events are more informal and private where not the entire consortium is involved. The most effective meetings I've had were at the LEA facilities themselves, as it allows the law enforcement agents to showcase their daily work. Of course, this is not always possible due to privacy issues.

Your research group is part of the EACTDA (European Anti-Cybercrime Technology Development Association) and you are its primary representative. According to you, how could EACTDA make law enforcement practitioners better take up research outputs?

We are part of the EACTDA association and this is a great way for community-building between researchers, industry, and LEAs. It is essential for researchers to understand the LEAs' needs to create prototypes and research that provides a benefit to the LEAs. Initiatives such as EACTDA or ILEAnet are a great way to get in contact and are oftentimes the starting point for new ideas and projects.

Do you have any original research strands you would like to share with us?

I've worked in projects which were not related to the security area, such as the European projects [PRIMAGE](#) (Predictive in-silico multiscale analytics to support cancer personalized diagnosis and prognosis, empowered by imaging biomarkers), [IN2DREAMS](#) (INtelligent solutions 2ward the Development of Railway Energy and Asset Management Systems in Europe), or [DayDreams](#) (Development of prescriptive AnalytIcs baseD on aRtificial intElligence for iAMS).

Our research group has also voluntarily developed [CoronaVis](#), which allows users to analyze data from the ongoing Covid-19 pandemic including hospital bed capacities for every hospital in Germany. Furthermore, users can create custom dashboards for any region in Germany. I am the technical coordinator and lead developer of this app. We will soon release a version that has worldwide data coverage.

Thank you very much Wolfgang for taking the time to answer to our questions. We wish you good luck for your future projects! For further information about Wolfgang's work, please visit the university website or contact him directly.

RESEARCHER'S TOOLBOX: "WHAT ARE EUROPEAN UNIVERSITIES AND WHAT WILL BE THEIR IMPACT FOR SECURITY RESEARCH?"

A key pillar of the European Education Area

European Universities are **transnational alliances of at least 3 higher education institutions** (from 3 EU Member States or other Erasmus programme countries). These alliances aim at developing a joint long-term structural and strategic cooperation for education and, where possible, links to research and innovation.

These European universities have to create a **European inter-university 'campus'** characterised by the following key elements:

- **Seamless mobility** (physical, virtual or blended) for students, staff and researchers to study, train, teach, do research, work or share services at cooperating partner institutions
- **Tackling of big issues** Europe is facing (such as climate protection, democracy, health, big data, migration) by transdisciplinary and transnational teams of students, academics and external stakeholders
- **Flexible curricula**, leading to a European Degree, for students
- **Entrepreneurial mind-set and civic engagement**, through practical and/or work-based experience.

"The European Universities initiative is a flagship initiative of the European Education Area. It will enable a new generation of Europeans to cooperate across languages, borders and disciplines, developing a strong European identity."

Thus, with the European Universities initiative, the **European Commission** aims at supporting the building of the universities of the future, having a structural, systemic and sustainable impact.

Why develop the European universities?

"The fast-changing labour market and societal transitions require higher education institutions to provide students, staff and researchers with the skills they need to navigate the **twin green and digital transition and build a resilient society**." As the demand for highly skilled people is increasing, future generations need to be empowered to find solutions to big societal challenges that Europe and the world are facing, and European universities need to better cooperate to accelerate the preparation of European young people.

The 3 core tasks of universities (**teaching, research and innovation**) and their central role will enable universities to address big societal challenges, foster cities and regions development and promote civic engagement.

How does the European Commission support the European universities initiative?

The European Commission launched two calls for pilots in 2018 and 2019 in order to **test different models for European Universities**. As of November 2020, 41 alliances were created, representing more than 280 higher education institutions from all over Europe. They were funded through Erasmus+, complemented by Horizon 2020 (up to € 5million from Erasmus+ and up to € 2million from Horizon 2020 per alliance).

A call for proposals for 2022 has been launched, representing € 272 million. Two topics were designed in this call to “support higher education institutions in gradually achieving their long-term ambitious vision towards becoming a fully-fledged European University”.

- the first topic will “provide support for already existing deep institutional transnational cooperation alliances including - but not limited to - the European Universities alliances selected under the 2019 Erasmus+ call for proposals”
- the second topic will “provide support for applicants wishing to establish new deep institutional transnational cooperation in a new ‘European Universities’ alliance”.

The deadline for applications submission is **22 March 2022**. Detailed information about the European Universities 2022 call is available on the Funding & Tender Opportunities Portal. You can rewatch the information session for the 2022 call for proposals.

What will be the impact on security?

Although security is not the primary objective of these new European universities, several key topics will be researched and taught in those universities, such as data science, artificial intelligence (including but not limited to natural language processing, visual recognition), digitalisation, cities’ transformation, etc.

Education

Students have access to **cross-sectoral and interdisciplinary curricula** and courses delivered by **innovative means**.

Research

Specific research **hubs** are being built to develop collaborative research between European universities. The promotion of **open science** practices and the creation of new **PhD** opportunities through European universities will indirectly benefit security research.

Industry

Collaborative links between research & industry are being developed.

Start-ups will emerge from the work carried out by European universities.

For further information about the European Universities initiative, please consult:

- European Commission. European Education Area: European Universities Initiative Available at: <https://education.ec.europa.eu/education-levels/higher-education/european-universities>
- European Commission. European Education Area: European Universities Initiative factsheet. 2021. Available at: <https://education.ec.europa.eu/document/european-universities-initiative-factsheet>
- European Commission. European Education and Culture Executive Agency: European Universities - Information Session for the 2022 Call for Proposals. 2021. Available at: https://www.eacea.ec.europa.eu/news-events/events/european-universities-information-session-2022-call-proposals_en
- An example of alliance is given by the European University of Technology (EUT+), encompassing 8 European partners, including ILEAnet related partners. Do not hesitate to contact them for further information.

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. Some resources are open access. All can be found in the [ILEAnet Knowledge Factory](#). ILEAnet collects the most recent or relevant publications in the following areas, but does not necessarily endorse their contents.

If you want to share a publication, please contact us at ensp-ileanet@interieur.gouv.fr

Cybersecurity

European Union Agency for Cybersecurity. Raising Awareness of Cybersecurity: A Key Element of National Cybersecurity Strategies. enisa. 11/2021. 53 pages. Available at: <https://www.enisa.europa.eu/publications/raising-awareness-of-cybersecurity>

This report seeks to assist EU Member States in further building their cybersecurity capacities by analysing best practices on raising citizens' awareness of cybersecurity.

Liu Marina, Yeoh William, Jiang Frank, et al. Blockchain for Cybersecurity: Systematic Literature Review and Classification. Journal of Computer Information System. Published online: 1 December 2021. <https://doi.org/10.1080/08874417.2021.1995914>

Using a systematic literature review of blockchain use cases for cybersecurity, the paper presents a classification framework and offer readers a comprehensive perspective of the potential of blockchain to enhance cybersecurity in different contexts.

Sturc B, Gurova Tatyana, Zelenkova Natalia, et al. Developing a System of Indicators for Clustering Financial Cybercrime. Journal of Applied Security Research. Published online: 13 December 2021. <https://doi.org/10.1080/19361610.2021.2013112>

This study aims to propose a system of indicators for dividing financial cybercrime into groups. Its results indicate absence of taxonomic indicators regarding clustering of financial cybercrimes and wide differences in approaches to the development of such indicators in relation to cybercrimes.

Terrorism

Campedelli GM, Cruickshank I, Carley KM. Multi-modal Networks Reveal Patterns of Operational Similarity of Terrorist Organizations. Terrorism and Political Violence. Published online: 14 December 2021. <https://doi.org/10.1080/09546553.2021.2003785>

The study proposes a novel computational framework for detecting clusters of terrorist groups sharing similar behaviors, focusing on groups' yearly repertoire of deployed tactics, attacked targets, and utilized weapons.

CEPOL. [Project presentation] CT INFLOW: The Counter-Terrorism Information Exchange and Criminal Justice Responses project. Available at: <https://www.cepol.europa.eu/projects/ctinflow>

The Counter-Terrorism Information Exchange and Criminal Justice Responses (CT INFLOW) project aims at contributing to prevent and disrupt terrorist networks and the activities of recruiters to terrorism, cutting off terrorist funding, and bringing terrorists to justice, while continuing to respect human rights and international law.

CEPOL. WB PaCT: Partnership against crime and terrorism in the Western Balkans. Available at: <https://www.cepol.europa.eu/projects/wbpact>

The Partnership against Crime and Terrorism project in the Western Balkans (WBPACT) aims at enhancing the capacities of the authorities in the Western Balkans to fight organised crime and terrorism including preventing and countering violent extremism by enhancing cooperation within the region and with the EU.

Europol, EU Internet Referral Unit. Transparency Report. Publications Office of the European Union. 2021. 13 pages. Available at: <https://www.europol.europa.eu/publications-events/publications/eu-iru-transparency-report-2020>

The 2020 European Union Internet Referral Unit (EU IRU) Transparency Report is a comprehensive summary of the EU IRU's main achievements in 2020. It provides a detailed account of the prevention activities and investigative support carried out by the unit, which aims at reducing the level and impact of online content promoting terrorism or violent extremism.

Open access Haugstvedt H. "It Gets a Bit Messy": Norwegian Social Workers' Perspectives on Collaboration with Police and Security Service on Cases of Radicalisation and Violent Extremism. Terrorism and political violence. Published online: 17 November 2021. Available at: <https://doi.org/10.1080/09546553.2021.1970541>

Social workers are a part of the prevention efforts against radicalisation and violent extremism in the Nordic countries. While multi-agency cooperation is not new in Norway, municipal cooperation with the police security service is. The consequences of this cooperation is researched in this paper.

Open access. Melhuish Francesca, Heath-Kelly C. Fighting terrorism at the local level: the European Union, radicalisation prevention and the negotiation of subsidiarity. European security. European security. Available at: <https://doi.org/10.1080/09662839.2021.2009458>

The study investigates how the EU mobilises a spatio-temporal imaginary of the "local" in its counter-radicalisation activities as a means of navigating subsidiarity principles and expanding its remit as a "holistic security actor". This research makes an original contribution by demonstrating how the EU also seeks to intervene "below" the level of the nation state.

Organised crime

Open access. Berlusconi G. Come at the king, you best not miss: criminal network adaptation after law enforcement targeting of key players. Global crimes. Published online: 09 December 2021. <https://doi.org/10.1080/17440572.2021.2012460>

This paper investigates the impact of the targeting of key players by law enforcement on the structure, communication strategies, and activities of a drug trafficking network.

European Commission. Police Cooperation Code: Boosting police cooperation across borders for enhanced security. 2021. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6645

On December 8, 2021, the European Commission proposed an EU Police Cooperation Code to enhance law enforcement cooperation across Member States and give EU police officers more modern tools for information exchange.

Gerlat PY. Focus on SEEKER, an artificial intelligence model to fight against wildlife trafficking. 2021. Available at: <https://www.actuia.com/english/focus-on-seeker-an-artificial-intelligence-model-to-fight-against-wildlife-trafficking/>

SEEKER is a Microsoft AI research project that has been piloted at London's Heathrow Airport and has demonstrated its ability to detect illegal wildlife items hidden in luggage and cargo.

Skinninger MA, Wang F, Pasin D, *et al.* A deep generative model enables automated structure elucidation of novel psychoactive substances. *Nature Machine Intelligence* 2021; 3: 973-984. <https://doi.org/10.1038/s42256-021-00407-x>

The article presents DarkNPS, a deep learning-enabled approach to automatically elucidate the structures of unidentified designer drugs using only mass spectrometric data.

Migration

European Commission, Directorate General for Migration and Home Affairs. Responses to long-term irregularly staying migrants: practices and challenges in EU Member States and Norway. European Migration Network Study. 2021. 48 pages. Available at: https://ec.europa.eu/home-affairs/system/files/2021-07/00_eu_long_term_irregular_staying_migrants_study_en_0.pdf

This study aims to provide an overview of existing policies and practices in the EU Member States and Norway towards third-country nationals in a prolonged situation of irregular stay.

Open access. Migration strategy group on international cooperation and development, Bither J, Ziebarth A. Automating Decision-Making in Migration Policy: A Navigation Guide. Bertelsmann Stiftung. 2021. 41 pages. Available at: <https://www.bosch-stiftung.de/en/publication/automating-decision-making-migration-policy-navigation-guide>

This "navigation guide" examines three use cases in migration policy where automated decision-making is already being tested or employed: visa application processes, placement matching to improve integration outcomes, and forecasting models to assist for planning and preparedness related to human mobility or displacement.

Tjaden J. Measuring migration 2.0: a review of digital data sources. *Comparative Migration Studies* 2021; 9(59). 1-20. Available at: <https://doi.org/10.1186/s40878-021-00273-x>

"Big data" or "digital trace data" have emerged as new sources of migration measurement complementing 'traditional' census, administrative and survey data. This paper reviews the strengths and weaknesses of eight novel, digital data sources along five domains: reliability, validity, scope, access and ethics.

You may also be interested in the following information:

European Commission. The European Assistance for Innovation Procurement initiative (EAFIP). 2022. Available at: <https://eafip.eu/>

The European Assistance for Innovation Procurement (EAFIP) initiative supports public procurers across Europe in developing and implementing innovation procurement.

European Commission. Enhancing security through Research and Innovation. 2021. 24 pages. Available at: https://ec.europa.eu/home-affairs/news/enhancing-security-through-research-and-innovation-2021-12-15_en

The document describes examples of how law enforcement authorities, border guards and first responders benefit from EU security research projects promoting innovative technologies and knowledge sharing. The area of activities range from fighting crime and terrorism to border management and disaster resilience.

Open access Europol. SIRIUS EU Digital Evidence Situation Report 3rd Annual Report 2021. 2021. 76 pages. Available at: <https://www.europol.europa.eu/publications-events/publications/sirius-eu-digital-evidence-situation-report-3rd-annual-report-2021>

EU law enforcement and judicial authorities, as well as Online Service Providers (OSPs) faced challenges in the field of electronic evidence and had to adapt existing processes. This report looks back at 2020, presenting data that include surveys conducted with EU law enforcement and judicial authorities, as well as interviews with representatives from ten OSPs.

Universitetet i Oslo (UIO). Call for Papers for Special Issue on “Anti-Government Extremism”. 2021. Tore Bjørgo and Kurt Braddock are soliciting proposal abstracts for a planned Special Issue of Perspectives on Terrorism to be published in December 2022. Available at : <https://www.sv.uio.no/c-rex/english/news-and-events/news/2021/call-for-papers-for-special-issue-on-%E2%80%9Canti-governm.html>

This is a solicitation for proposal abstracts for a planned Special Issue of Perspectives on Terrorism to be published in December 2022.

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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