4 Networks Conference

Cooperation in strengthening environmental enforcement

Rome (IT) 28-29 September 2023

Co-funded by the European Union

Artificial Intelligence and its application

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FONDAZIONE VITTORIO OCCORSIO

Foreword (1)

This presentation summarizes the activities carried out by the Fondazione Vittorio Occorsio (FVO) through a specific Work Group coordinated by Pasquale Fimiani, with the scientific support of Giuseppe Sgorbati, on the use of Artificial Intelligence in prevention and fight against Environmental Crimes

Vittorio Occorsio was a prosecutor who spent his professional life in prosecuting organized crime. He was killed on July 10, 1976 by terrorism.

FONDAZIONE VITTORIO OCCORSIO

Several Public Subjects, with their experts, took part to the activities, among which it is necessary to mention the **Judiciary Sistems**, many different **Police Forces**, **Universities** and **Enviromental Authorities**, giving their contribute on the **Juridical**, **Informatic**, and **environmental protection** topics

Also relatioships with Foreign **Institutions** fostered the work done, such as:

- UNODC - United Nation Office for Drugs and Crime, Partner of FVO through a MoU on exchange of information and experience on AI use in crime tackling
- USEPA - Environment Protection Agency of USA that, after first contacts in the framework of cooperation with IMPEL Network, supplied very useful information about the development of the use of AI, having back information regarding some best practices in use in Italy

UNODC

Foreword (2)

Among the **Aims of the Foundation**, there is the **renewal of culture and legal instruments, to keep them up to date with the rapid evolution of society**

Vittorio Occorsio was a prosecutor who spent his professional life in prosecuting organized crime. He was killed on July 10, 1976 by terrorism.

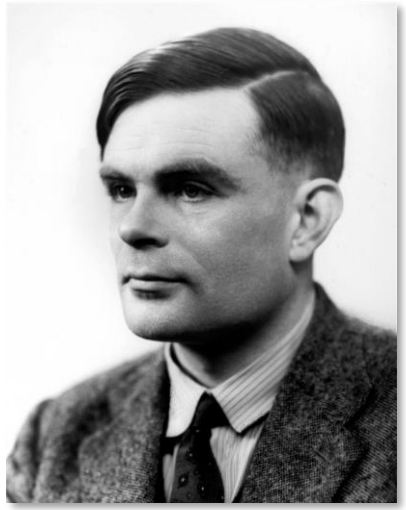
FONDAZIONE VITTORIO OCCORSIO

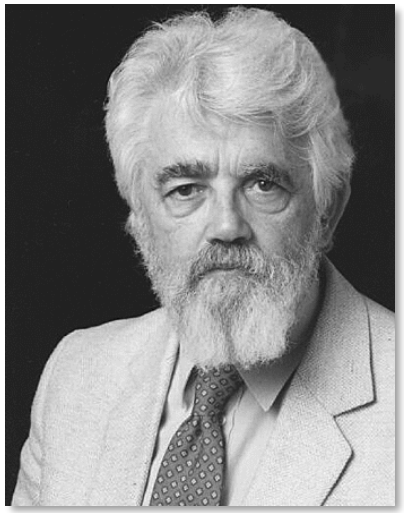
For this reason, beside the development of researches, the Foundation is engaged in **educational activities** towards public institutions operating in the field of environmental criminal jurisdiction and take part in relevant conferences, such as:

1. Course on "***Informatics crime and artificial intelligence***", School of Specialization for the Police Forces, Rome, 16th – 19th May 2022. See in particular, the lesson "***Technology in the fight against environmental crime***", which dealt with the case of the application of AI in environmental control
2. Course organized in collaboration with the Arma dei Carabinieri, in the framework of the *Sabaudia Project – International Center of Excellence for the protection of the environment and the protection of the territory*, containing the session "***Technical Innovation and Artificial Intelligence in Environmental Survey and Investigation***", Sabaudia, 16th February 2023
3. Course organized "**Artificial Intelligence, Law and Trial**", in favour of the High School of the Magistracy, with a focus group on "**AI in environmental crimes**", Florence, 20th – 22th March 2023
4. Participation in the Conference "***Drones against illicit waste trafficking***", organized within the European project OPFA Waste, Soave, 15th – 17th March 2022
5. Participation in the ***Conference within the European Project Emeritus***, representing the European Network of Prosecutors for the Environment – ENPE, Verona, 17th March 2023

ARTIFICIAL INTELLIGENCE

An overarching definition that include many concepts and instruments





A tribute to the Fathers of AI

Conceptually defined by ***Alan Turing*** through a test, the *Imitation Game*, that verify a machine's ability to exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human (1950)

The name "Artificial Intelligence" could be attributed to John McCarthy (1956), Marvin Minsky (Carnegie-Mellon University) specified it as "the construction of computer programs that engage in tasks that are currently more satisfactorily performed by human beings because they require high-level mental processes"

The potential of AI, envisaged more than 70 years ago, find a development nowaday because of the availability of a huge amount of digital data and of powerful computer systems, hardly imaginable at that time

A lot of definition of AI in literature, since its conceivement, each one of them inspired by one of the several definitions of *Human Intelligence*

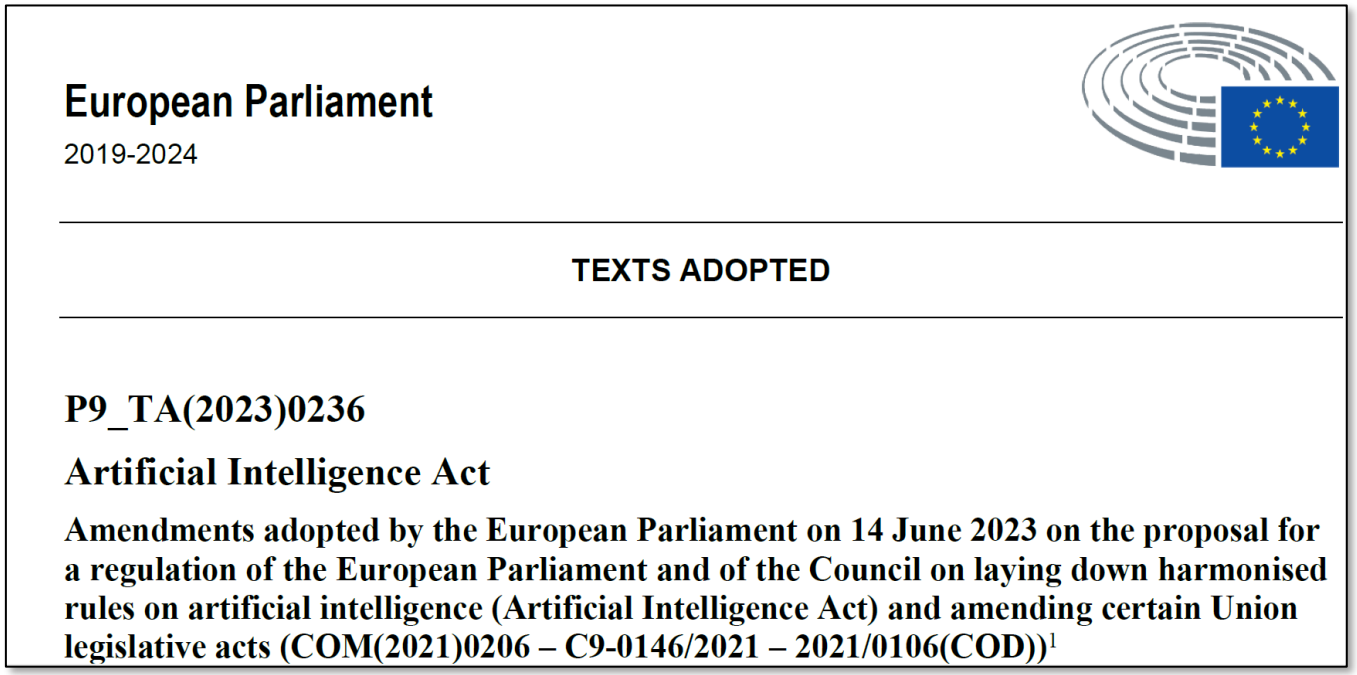
What will be useful to us are the definitions that have been adopted by the

European Parliament

working on the proposal for a

EU Artificial Intelligence Act

in the perspective to face risks arising from the use of AI



European Parliament
2019-2024

TEXTS ADOPTED

P9_TA(2023)0236

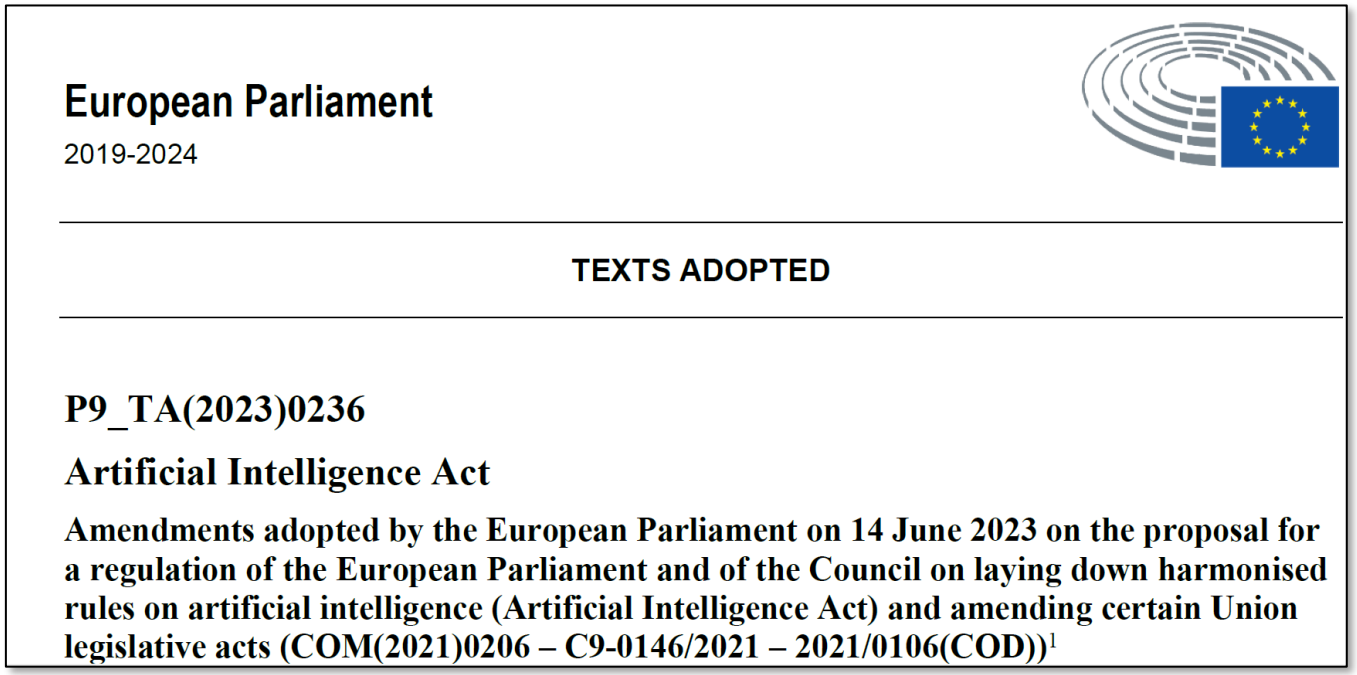
Artificial Intelligence Act

Amendments adopted by the European Parliament on 14 June 2023 on the proposal for a regulation of the European Parliament and of the Council on laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts (COM(2021)0206 – C9-0146/2021 – 2021/0106(COD))[1]

The definition

Amendment 165
Proposal for a regulation: THE AI ACT
Article 3 – paragraph 1 – point 1

"'artificial intelligence system' (AI system) means *a machine-based system that is designed to operate with varying levels of autonomy and that can, for explicit or implicit objectives, generate outputs such as predictions, recommendations, or decisions, that influence physical or virtual environments*"



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But also … recognition of the risks arising from its use

Amendment 19
Proposal for a regulation: THE AI ACT
Recital 6 a (new)

*" …. This Regulation is aimed at addressing **new potential risks** that may arise by **delegating control to AI systems**…."*

*"…. AI systems are based on **abstract mathematical relationships** that are difficult **for humans to understand**, monitor and trace back to specific inputs…."*

*"….These complex and opaque characteristics (black box element) **impact accountability and explainability**…."*

The report is divided into two parts:

The first part, entrusted to **Giuseppe Sgorbati**, will deal with:

- Some conceptual aspects of AI that serve to understand, in a very simplified way, how it works and to highlight some points of attention that can condition its use in the judicial field

And, through non exhaustive examples:

- The use of AI in the field of risk analysis aimed at drafting inspection programs
- The use of systems that implement the concept of computer vision
- The current and potential use of general data analytics for consistency analysis of datasets and databases

Examples of logical and organizational structures considered useful for the best use of AI systems will be as well given.

In the second part, instead, **Pasquale Fimiani** will examine the legal aspects of the use of artificial intelligence in the prevention and fight against environmental crime, also referring to the provisions of the AI Act and of the proposal for a new Directive on the protection of the environment through criminal law, currently being approved.

Intelligence is a very wide concept that characterize humans.
Which analogies can we use to describe AI?

Humans

Modeling of the reality: capability to describe cause-effect relationship

The human *explicit models* impose a *structure* (*a rule…*) to the data extracting answers from them

and

Accumulation and use of *Experience*

ability to predict based on witnessing the **repetition of similar cases**

To Machines → ***How?***

«Teaching» to the machine the digital description of the reality (*a traning dataset*) to simulate of the possession of an *Experience*

The Machine will autonomously find **implicit statistical relationships** (that remain unknown to the user), **in the training dataset, used to perform the desider analysis of a samples**

In **artificial intelligence** a computational procedure, given examples,extract *a* **structure from the data**, and the use of this *implicit* ***structure*** replace the ***explicit model***

Short list of AI instruments that can be adapted to Environmental Jurisdiction

Some applications need the **use of databases as digital representation of the reality**

Three examples:

- Risk Assessment
analysis of the attributable risk of crime commission to subjects, that can be *natural* or *legal persons*

- General Data Analytics
Search for relationships and verification of data sets looking for linkages and or anomalies,

- Predictive policing
analysis and prediction of the spatial and temporal probabilistic distribution of crime commission

Some **enables machines to interpret the same information that humans can get through their senses**

Three examples:

- Computer vision:
Analysis and interpretation of images

- Natural language processing
Analysis and interpretation of texts

- Speech recognition
Analysis and interpretation of speech

Some examples, operative or under study, of application in environmental protection field of the above categories of applications are following

Risk Assessment of installations through AI (ML) to target inspections

Best known **experiences**: US EPA

The basis: USEPA Next Generation Compliance program (2013 – 2017, discontinued) - a strong initiative to overcome «*data starving*», to introduce massively data analytics, as well as to enanche the citiziens participation and feed-back (Enforcement and Compliance History Online – ECHO Website)

Main aim: In search of a tool that can mantain or increase of the effectiveness of administrative inspections in the face of the limitation of the resources and the increase of the challenges

Philosophy: more «hit on targets» (inspections discovering non compliances) = more protection, without increasing the number of inspections (and inspectors and costs as well).

Note: *The logic seems to be quite different than what used at EU level, i.e. in IED indications, where **risk is intended as potential harm to the people and evironment** and inspection planning should be based on **criteria that suggest the implementaton of cause-effect relatioships models**, such as IMPEL EasyTool IRAM or Italian SSPC*

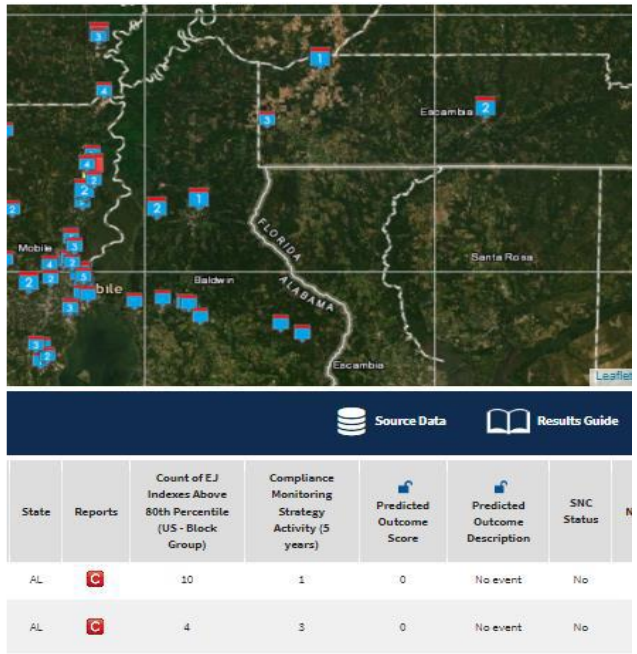
Risk Assessment of installations through AI (ML) to target inspections

First example - Field of application:
Inspection planning at installations on the management of solid hazardous and non-hazardous wastes. (USA Resource Conservation and Recovery Act - RCRA), prioritized through ranking of non-compliance risk

ML tool used: Random Forests Algorithms (tested 4 different ML tools)

Data used for machine training: A subset from 15 years of historical data regarding installations including tens of thousands of variables such as:
- Facility characteristics (location, industry, shipments, etc)
- Historical enforcement and compliance data

Output and its use: ranking of installations in term of *non-compliance risk*



State	Reports	Count of EJ Indexes Above 80th Percentile (US - Block Group)	Compliance Monitoring Strategy Activity (5 years)	Predicted Outcome Score	Predicted Outcome Description	SNC Status
AL	C	10	1	0	No event	No
AL	C	4	3	0	No event	No

Representation of the output:
Output presented as two columns (score and description) in the table returned by the ECHO* Hazardous Waste Facility Search on ECHO's government only website and as GIS

Test and results: Retrospective Test on a subset of installations extracted from historical data: It has been found that the model could increase targeting accuracy by 47%, increasing the "hit rate" from 38% to 56%

*ECHO: Enforcement and Compliance History Online database

Risk Assessment of installations through AI (ML) to target inspections

Second example - Field of application:

Inspection planning at installations for the protection of water environment (USA Clean Water Act), prioritized through ranking of non-compliance risk

ML tool used:

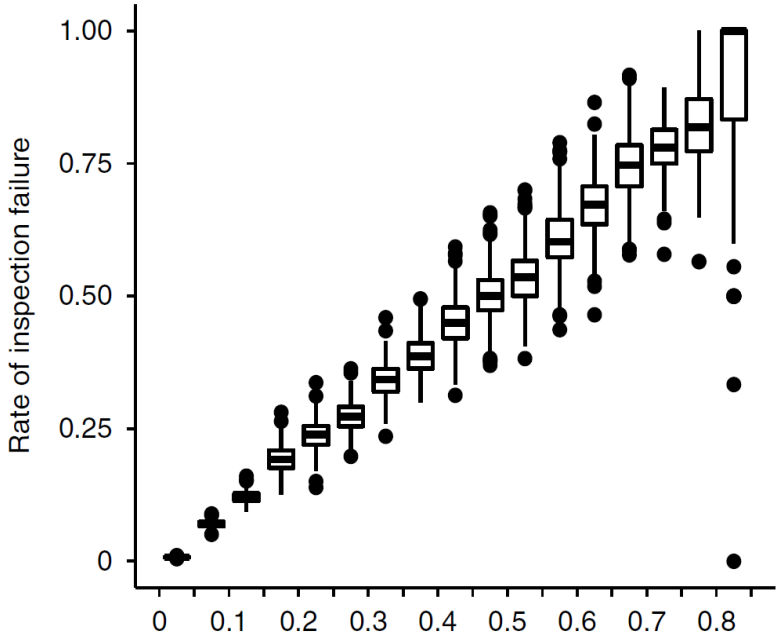
Random Forests Algorithms

Data used for machine training:

EPA ECHO database as of 16 April 2017.

The original data file included 1,831,032 facilities. The work was focused on 316,030 facilities with complete information on facility characteristics.

Output and its use: ranking of installations in term of *non-compliance risk*



Rate of detection and reporting of a violation at the facility (*inspection failure*) Vs facility risk score

From: *Machine learning for environmental monitoring*
M. Hino, E. Benami * and N. Brooks
Nature Sustainability | VOL 1 | OCTOBER 2018 | 583–588 |
www.nature.com/natsustain

Test and results: Retrospective Testing on a subset of installation extracted from historical data. The regression forest correctly predicted inspection outcomes for 94.1% of facilities

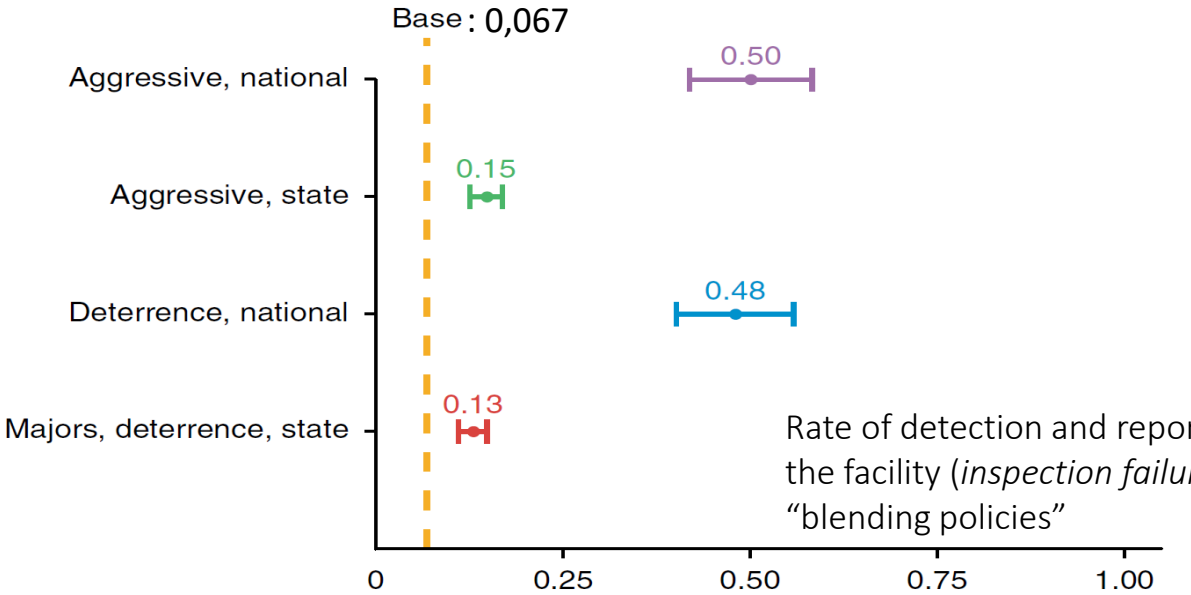
A challenge:

Using directly the output of the ML Systems to produce inspection planning?

There are drawbacks, e.g.:

- a 100% use of the available resources to inspect higer risk installation would disincentivate lower risk installation to implement environmental regulations.
- the fully automation of the system would prevent the management of other issues non considered in the training of the algorithm

The use of ML outputs require an evaluation and, possibly, corrections, blending it with «human made plans»: a policy decision



Rate of detection and reporting of a violation at the facility (*inspection failure*) with different "blending policies"

Clean Water Act: simulation of the effect in inspection planning of the use of only the 20% of ML system Output blended with human made programs with different territorial distribution policies

From: *Machine learning for environmental monitoring*
M. Hino, E. Benami * and N. Brooks
Nature Sustainability | VOL 1 | OCTOBER 2018 | 583–588 |
www.nature.com/natsustain

General Data Analytics

Fraud detection: Discharge Monitoring Reports (DMR) Integrity checks

Field of application and reason why:

An important legacy of Next Generation Compliance program (2014 – 2017) is **self** reporting of water discharge analisys of installations (Discharge Monitoring Reports - **DMR**) to EPA , used also as one of the drivers to design inspection plans. In case of self reported violations , the facility is categorized and prioritized for an enforcement action

Methodology:

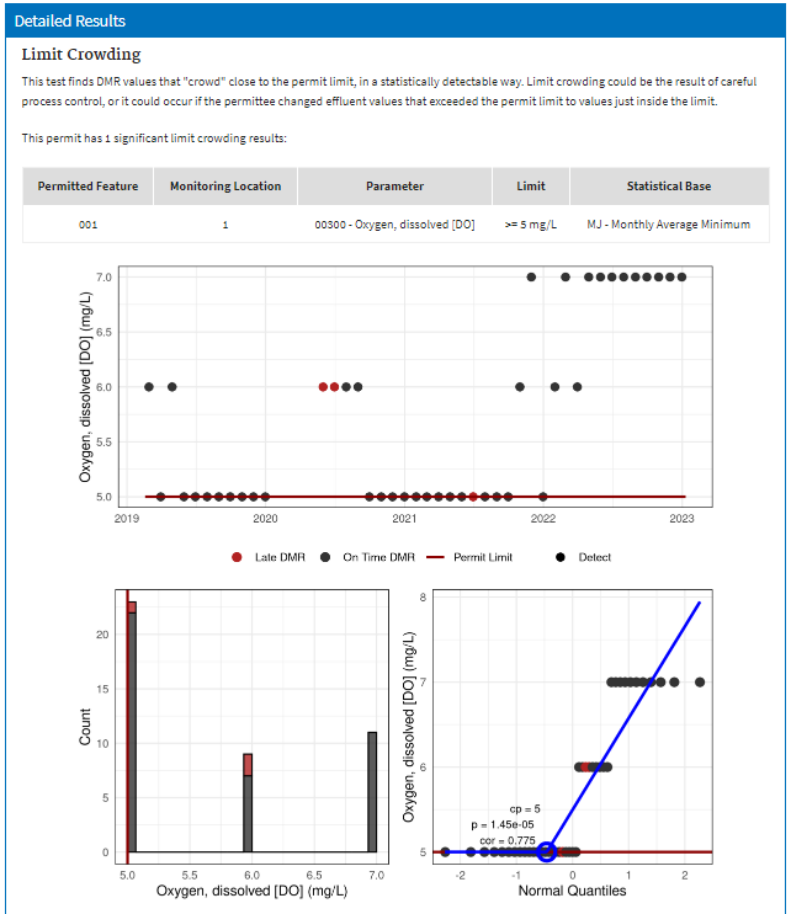
DMR Integrity uses statistical filters to identify features of a facility's DMR that suggest misreporting (confrontation of the distribution curves with "statistically true shapes", check of the flattening of the curves near limits, etc.)

Use:

Facilities with high probability of misreporting **may be candidates for further review** and on-site investigation, compliance assistance, or civil or criminal enforcement.

Effect:

Increased deterrence on frauds, considering criminal personal liability for the data submitter



From the presentation:
U.S. Environmental Protection Agency's National Targeting Center -
Online meeting EPA – FVO – ARPA
Lombardia 6 march 2023

Hot to manage the complexity of Data Analytics?

The technical and organizational backbone that made possible the use of advanced Data Analytics tools in Environment protection in USA:

the *National Targeting Center*

Historical driver:

After overcoming the «data starving» phase, thanks to the Next Generation Compliance program, the faced issue was how to use at best, everywhere, the large amount of data at disposal.

The identified solution:

The consitution of a high specialitazion center to support inspection planning: *the **National Targeting Center,*** that implement a «*customer focused, data driven approach, serving as a targeting and analysis resource for both **EPA and state/tribal/local compliance and enforcement programs***»

Resources at disposal:

- Over 50 targeting tools, tools are also developed upon request
- Community of Practice EPA – States
- Custom corporate financial analysis and *ad-hoc* data analysis support

General Data Analytics

A perspective under study in Italy:

Fondazione Vittorio Occorsio initiative for a feasibility study to be proposed to Compentent Authorities for the use of waste management databases in administrative non compliance and crime tackling, in search of illicit trafficking hidden in legal activities

UNIONCAMERE Banca dati MUD — Production

ALBO NAZIONALE GESTORI AMBIENTALI — Transport

SISPED — Sistema informatico raccolta dati per le ispezioni sulle spedizioni rifiuti autorizzate con procedura notifica ed autorizzazione preventiva scritta - Regolamento (CE) n. 1013/2006 — Inspections on Shipments

ORSO3.0 Osservatorio Rifiuti SOvraregionale — Local picture of wastes production

ISPRA Catasto Rifiuti — Sistema Nazionale per la Protezione dell'Ambiente — National Picture of wastes production ad Permitting situation

Sistema Informativo Regionale Rifiuti CGR WEB LOMBARDIA Catasto Georeferenziato Rifiuti — Territory Situation – Georeferred Installations Inventory

CHALLENGES

- The expansion information sources: complementary data, other logically connected areas (e.g., fiscal data, financial data)
- Need to overcome databases accessibility problems, congruence, interoperability and, last but not least, issues regarding poor data quality, updating, scarce maintenance and lack of cross checks of the databases
- To pay particular attention to the needs of *the data analysis Final User,* particularly in Justice field, considering the specific needs, constraints, rules that are in place
- Big attention on how to integrate in the analysis "sensitive databases", such as Judicial ones; furthermore: the Big Data challenge

Computer Vision

Computer vision, **as recognition of patterns, objects, situations through digitalized images** is another field that demostrated a high efficiency and effectiveness, because it makes possible to massively analyze images that would require extremely complex and time-consuming human activity.
Furthermore, «computer vision» can be used as well for **pollution monitoring**, merging the capability of detection of pollutants of **modern remote sensing devices** with the capability of interpretation of ML systems

Field of application studied

Search for unauthorized installations

Search for illegal wastes dump sites and unlawful management of waste installations

The examples encountered use the same **AI System based on Image Analysis and Categorization System using convolutional neural network (CNN) scene classification models**, implemented, in this case, by different Organizations in different countries

Search for unauthorized installations

Mapping Concentrated Animal Feeding Operations (CAFO), USA

"CAFOs generate about 335 million tons of waste per year, with excess nutrients posing considerable ecological and human health risks»

Graham, J. P. & Nachman, K. E. Managing waste from confined animal feeding operations in the United States: the need for sanitary reform. *J. Water Health* **8**, 646–670 (2010).
Conerly, O. & Vazquez Coriano, L. *Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality* Report No. EPA 820-R-13-002 (EPA, 2013)

"EPA estimates that nearly 60% of CAFOs do not hold permits"

(Environmental Protection Agency National pollutant discharge elimination system (NPDES) concentrated animal feeding operation (CAFO) reporting rule. *Fed. Regist.* **76**, 65431–65458 (2011).

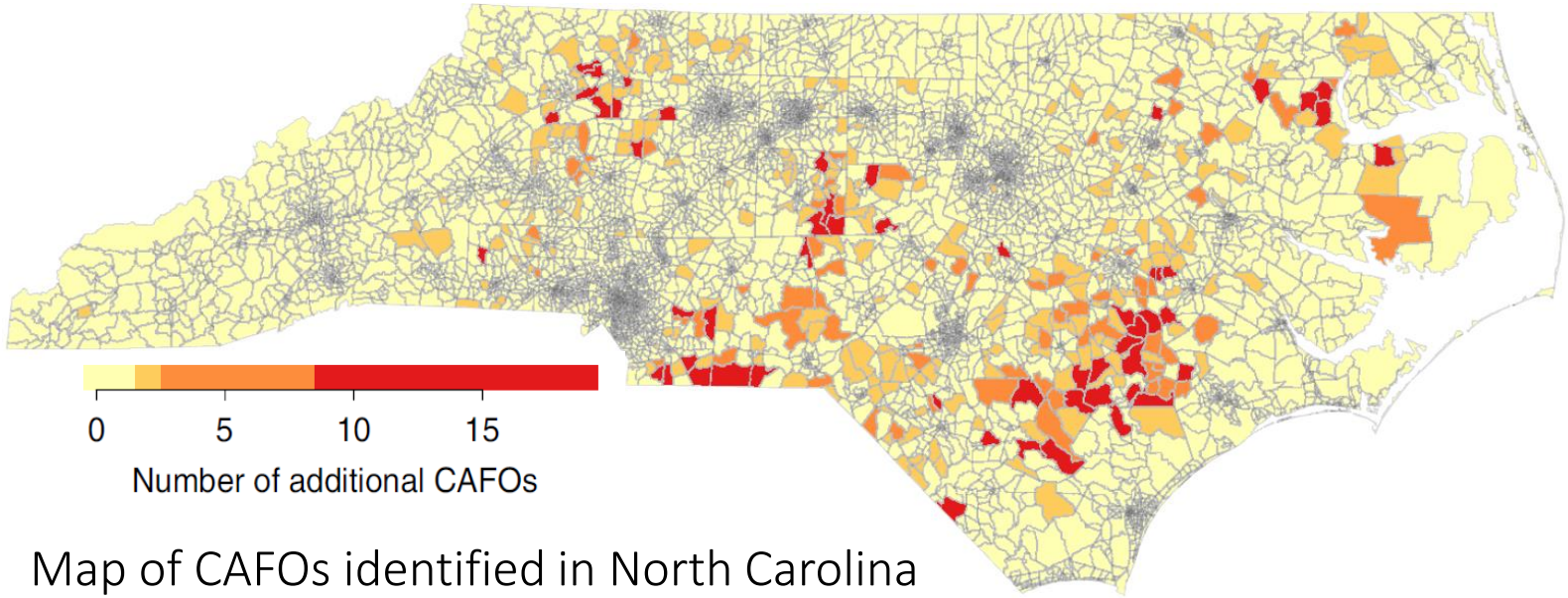
The imagery availability

«*US Department of Agriculture's National Agricultural Imagery Program (NAIP). Acquired annually during the growing season on a three-year cycle staggered across states, these images are easily downloadable through an online service at resolutions up to 1 m per pixel (Supplementary Notes). We downloaded all imagery for the state of North Carolina in the format of 299 × 299 image tiles at a resolution of 1 m per pixel and manually tagged 24,440 images*»

Study performed to test Deep Learning to map concentrated animal feeding operations

Cassandra Handan-Nader and Daniel E. Ho: Stanford Law School and Department of Political Science, Stanford Unveristy - Stanford Institute for Economic Policy Research, Stanford, CA, USA On Deep learning to map concentrated animal Nature Sustainability 298 | VOL 2 | APRIL 2019 | 298–306 | www.nature.com/natsustain

The System is performing better than human operators



Map of CAFOs identified in North Carolina by the ML model **in addition** to those identified by human operators **(+15%)**

Illustration of "**Class Activation Map**" for image-level classification

Search of illegal wastes dump sites and unlawful management of installations

Project SAvaGeR - ARPA Lombardia (IT)

Advanced Surveillance in Wastes Management
Collaboration with Politecnico di Milano University
2018 - nowaday

Aim: fight against illegal waste storages, becoming also a direct safety and sanitary issue because of the increase of fires, often related to criminal activity

Preliminary Test: human recognition and mapping using open source earth imagery (63 municipalities, 1.347 km^2)

Implementation: «*The [ML training] dataset comprises 3000 images from which 33% are positive samples. Such positive sites were identified by experts who manually screened orthophotos at a resolution of 20 cm per pixel acquired during 2018 in three Italian provinces*»

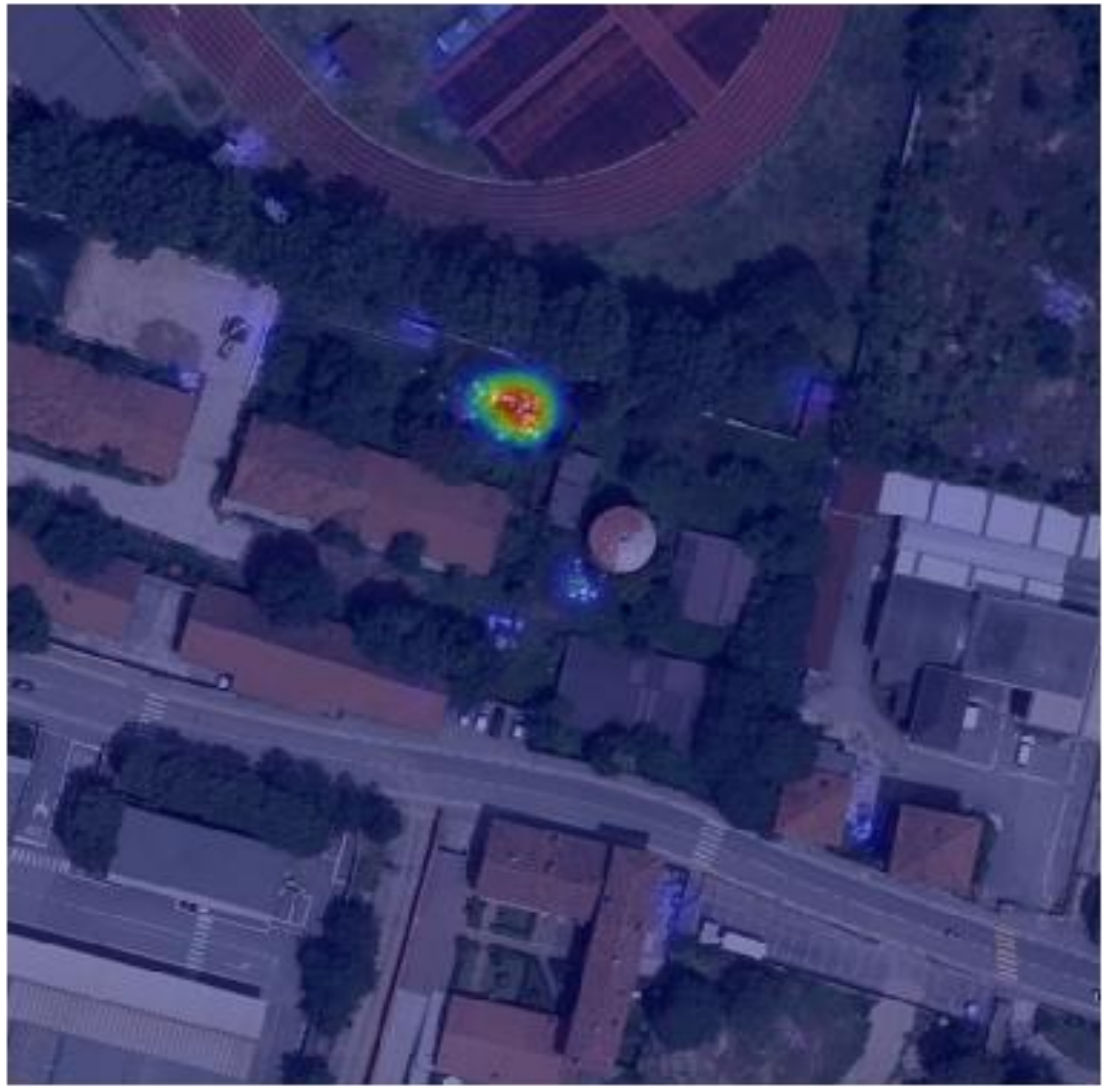
Quality of the results

"However, the model generalizes very well on the test dataset with average precision exceeding 94% and 90% precision at 89% recall"

(see: Torres, R.N.; Fraternali, P.: Learning to Identify Illegal Landfills through Scene Classification in Aerial Images. Remote Sens. 2021, 13, 4520. https://doi.org/10.3390/rs13224520)

The original image

The «Class Activation Map»



The original image

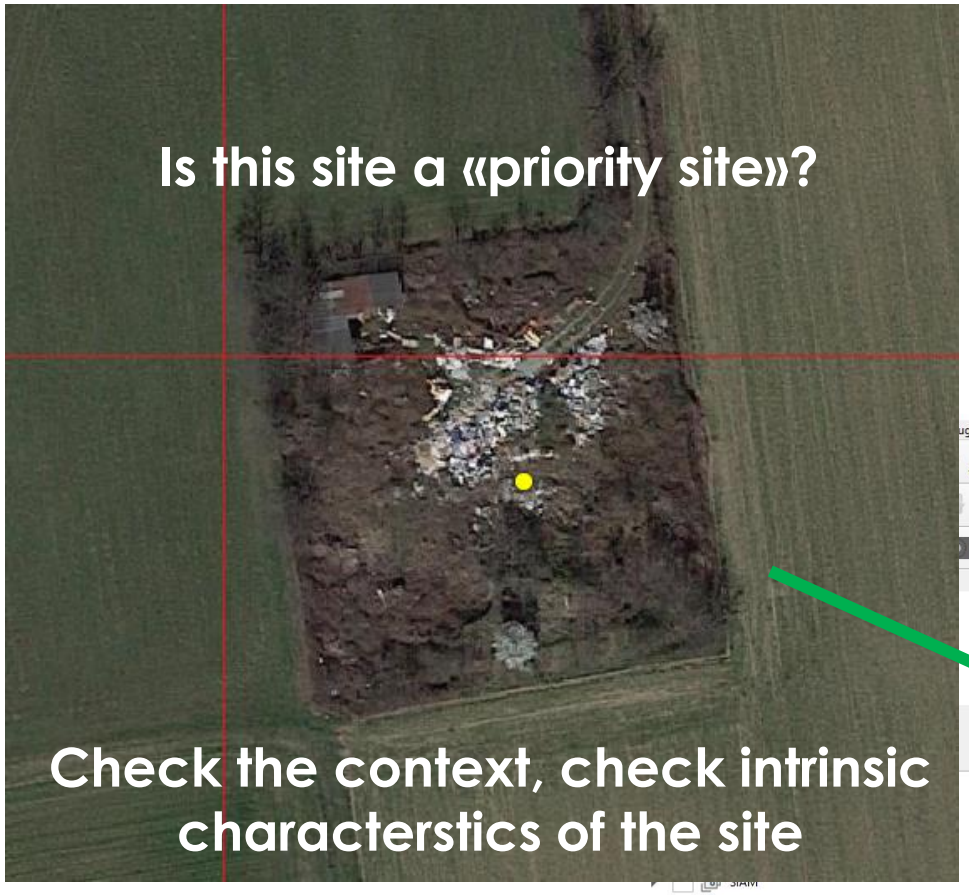
The «Class Activation Map»

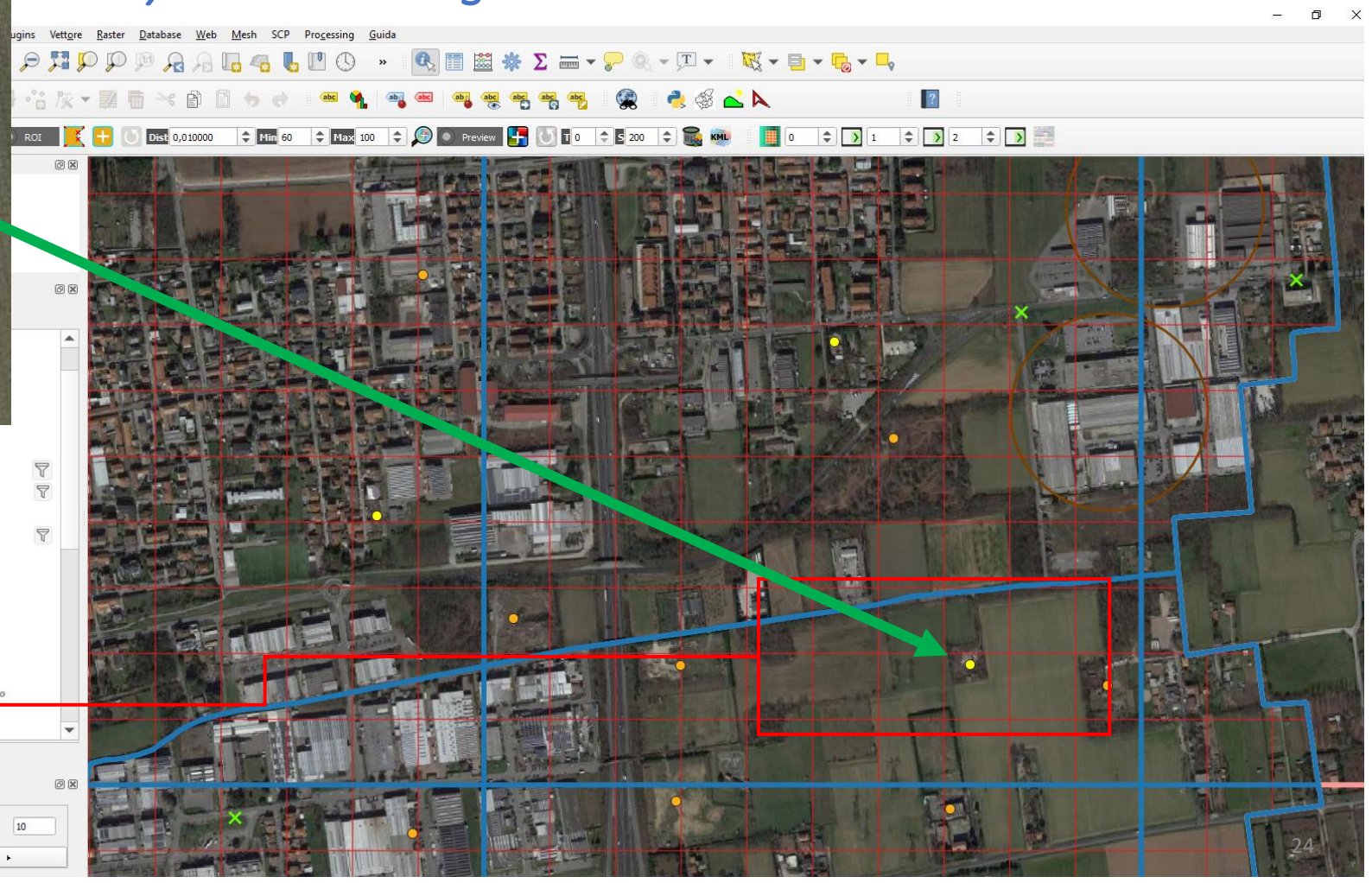
The original image

The «Class Activation Map»

Co-funded by the European Union

How to program inspections when number of suspected case exceed the capabilities of the available human resources? An example: *ranking of the cases based on risk analysis made using indicators*



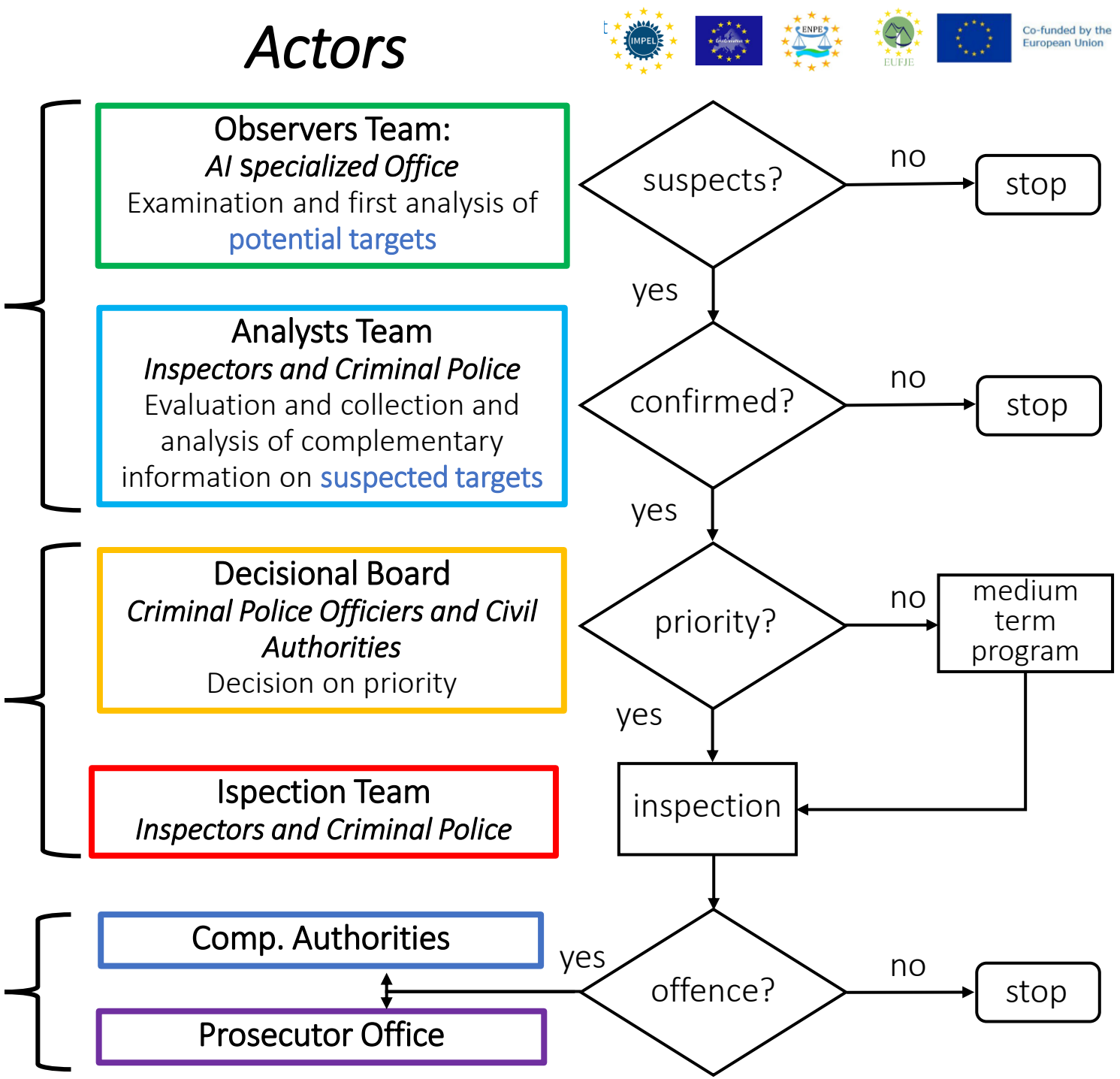


3 main indicators:

- Environmental risk index
- Severity of the suspected non-compliance index
- Non-compliance certainty index

The management of Earth Oserbation outcomes.

A possible scheme also applicable to highly productive environmental surveillance tools such as Artificial Intelligence Systems



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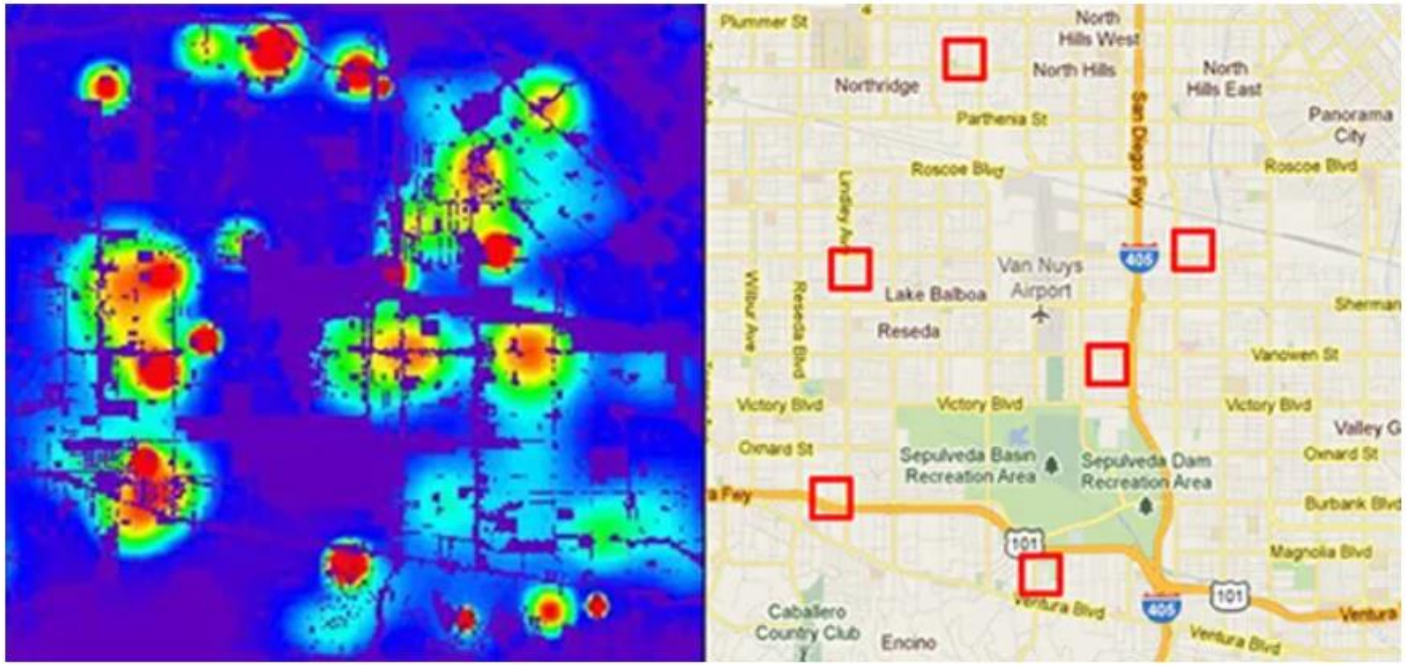
FONDAZIONE VITTORIO OCCORSIO

Predictive Policing:
Room in preventing and tackling environmental crimes?

Predictive policing could be described as: analysis and prediction of the spatial and time probabilistic distribution of crime commission to **deploy at best police resources to prevent or to timely tackle crimes**

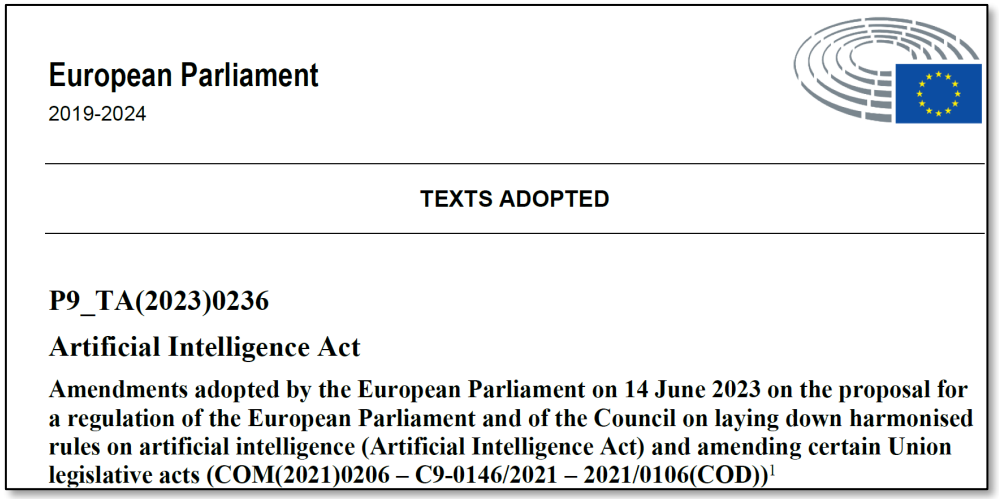
It represent the evolution of the «*pin on the map*» methodology used by policemen to describe crimes patterns on the territory and to plan patrols



From: Smithsonian Magazine – Randy Rieland https://www.smithsonianmag.com/innovation/artificial-intelligence-is-now-used-predict-crime-is-it-biased-180968337/

The implementation of the AI technique in environmental crime prevention and tackling could be envisaged in the case of specific «territory related» crimes, such as illegal logging of trees, waste abandoning and dumpings, waste waters discharging, etc. in which some forecasting conditions, or predictors, could be singled out by AI Systems, even if implicitly, through «learning» from previous cases, to be used to analyze and unknown situation.

Legal Aspects



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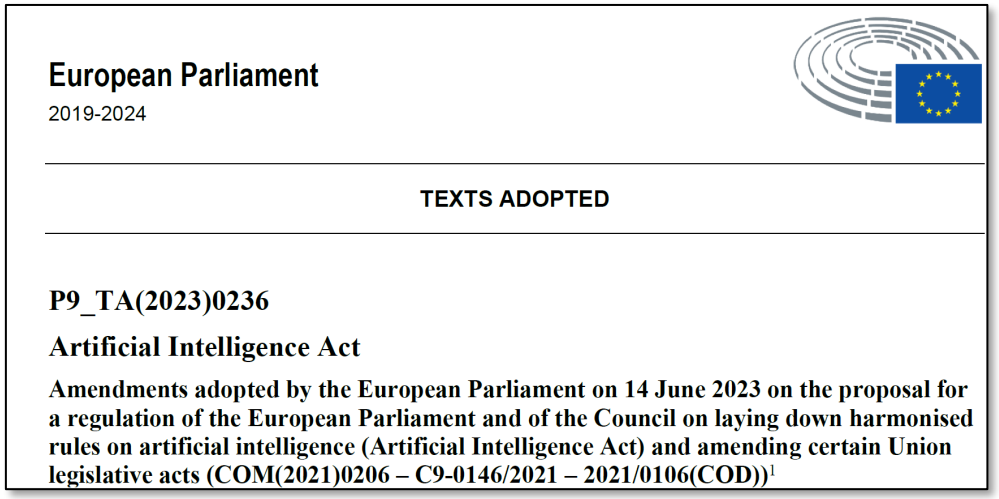
The examples that have been illustrated demonstrate the possibility of important applications of AI for the planning of environmental surveillance actions and administrative controls, which can lead to criminal investigations.
With reference to these activities, it is necessary to verify whether it is applicable the prohibition of risk assessment provided for by art. 5, point d-a) of the Artificial Intelligence Act in the text amended by the European Parliament, for which:

"The following artificial intelligence practices shall be prohibited: … (d-a) the placing on the market, putting into service or use of an AI system for making risk assessments of natural persons or groups thereof in order to assess the risk of a natural person for offending or reoffending or for predicting the occurrence or reoccurrence of an actual or potential criminal or administrative offence based on profiling of a natural person or on assessing personality traits and characteristics, including the person's location, or past criminal behaviour of natural persons or groups of natural persons".

Legal Aspects:

Profiling



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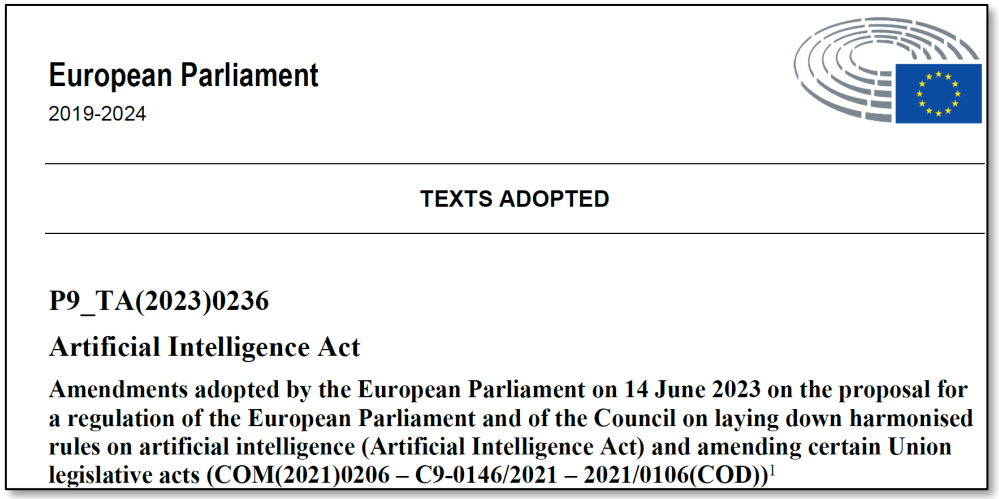
Art. 1, point 44-c) defines as '**profiling**'

"**any form of automated processing of personal data** as defined in point (4) of Article 4 of Regulation (EU) 2016/679; or in the case of law enforcement authorities – in point 4 of Article 3 of Directive (EU) 2016/680 or, in the case of Union institutions, bodies, offices or agencies, in point 5 Article 3 of Regulation (EU) 2018/1725"

In all of these articles, profiling is defined as:

"**any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person**, in particular to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, **behaviour**, location or movements".

Legal Aspects:
Predictive Policing



European Parliament
2019-2024

TEXTS ADOPTED

P9_TA(2023)0236

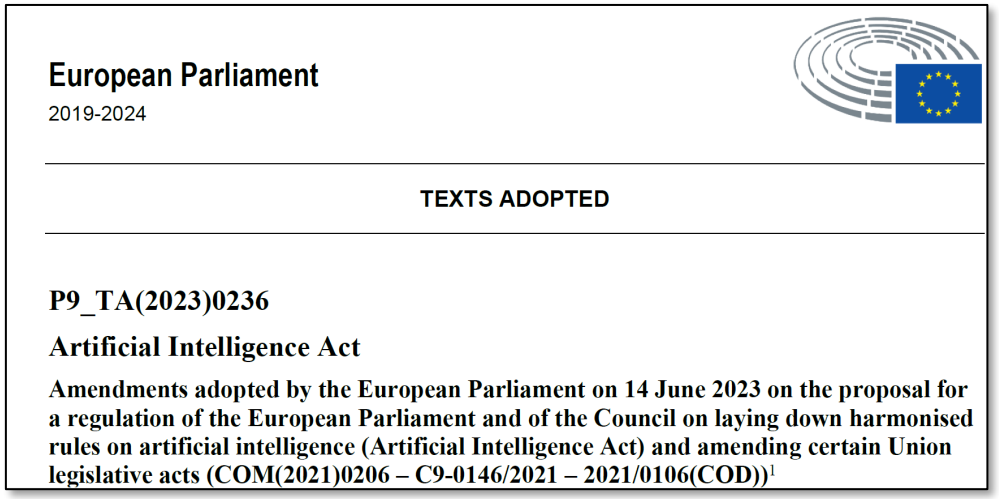
Artificial Intelligence Act

Amendments adopted by the European Parliament on 14 June 2023 on the proposal for a regulation of the European Parliament and of the Council on laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts (COM(2021)0206 – C9-0146/2021 – 2021/0106(COD))[1]

Recital 26-a) of the Artificial Intelligence Act explains the **prohibition of risk assessment**:

"**AI systems** used by law enforcement authorities or on their behalf **to make predictions, profiles or risk assessments** based on **profiling of natural** persons or **data analysis based on personality traits and characteristics**, including the person's location, or past criminal behaviour of natural persons or groups of persons for the purpose of predicting the occurrence or reoccurrence of an actual or potential criminal offence(s) or other criminalised social behaviour or administrative offences, including fraud prediction systems, **hold a particular risk of discrimination** against certain persons or groups of persons, as **they violate human dignity as well as the key legal principle of presumption of innocence**. **Such AI systems should therefore be prohibited**".

Legal Aspects:
Considerations



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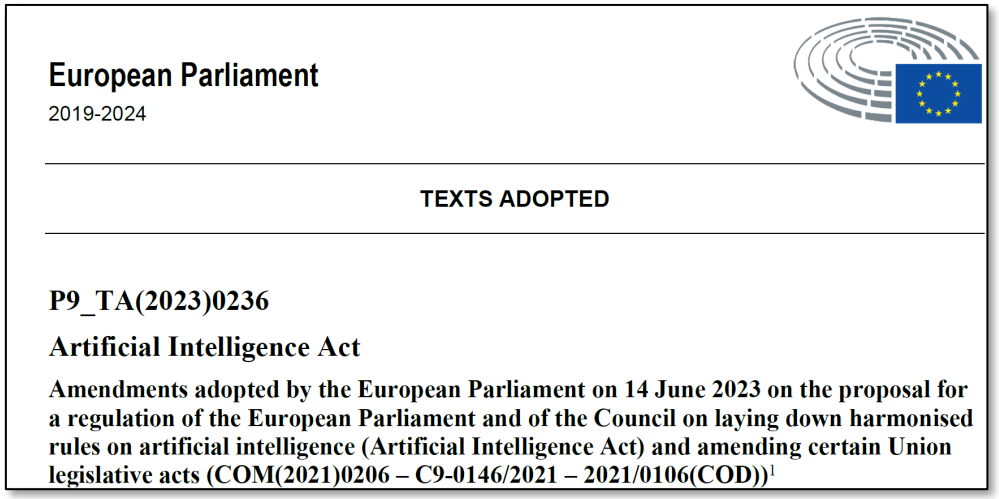
From these rules it is clear that the prohibition of profiling concerns predictive aspects of the behavior of natural persons on the basis of specific individual characteristics, as allowing the possibility of foreseeing future anti-legal conduct could harm people's dignity and be discriminatory. Different is the activity of prevention and contrast to environmental illegality based on the monitoring of the territory and on objective risk conditions, due for example to the particular characteristics of the factories, or to situations of diffuse pollution, or to the abnormal movement of waste, as in the case of AI (Computer Vision) applied to Earth Observation

In these cases, there is not a predicting activity of illegal behavior of natural persons on the basis of personal characteristics, but of selecting the timing and direction of controls on the basis of objective data that are not referred to predetermined subjects.

It has to be also considered that the risk analysis applied to inspection planning, as made in some cases described in this report, is referred to corporate bodies and not to natural persons.

Legal Aspects:
Considerations



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The use of AI for environmental protection is also provided for by the AI Act, in Recital 3:

"By improving prediction, optimising operations and resource allocation, and personalising digital solutions available for individuals and organisations, the use of artificial intelligence can provide key competitive advantages to companies and support socially and environmentally beneficial outcomes, for example in healthcare, farming, food safety, education and training, media, sports, culture, infrastructure management, energy, transport and logistics, crisis management, public services, security, justice, resource and energy efficiency, environmental monitoring, the conservation and restoration of biodiversity and ecosystems and climate change mitigation and adaptation."

A perspective:

The new Environmental Crime Directive

EUROPEAN COMMISSION

Brussels, 15.12.2021
COM(2021) 851 final

2021/0422 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on the protection of the environment through criminal law and replacing Directive 2008/99/EC

{SEC(2021) 428 final} - {SWD(2021) 465 final} - {SWD(2021) 466 final}

In the proposal for a new EU directive regarding the protection of the environment through criminal law, two articles seems to be relevant from the point of view of the use of Artificial Intelligence.

Article 18 - Investigative tools

"…. effective investigative tools, ….. are also available for investigating or prosecuting offences…. "

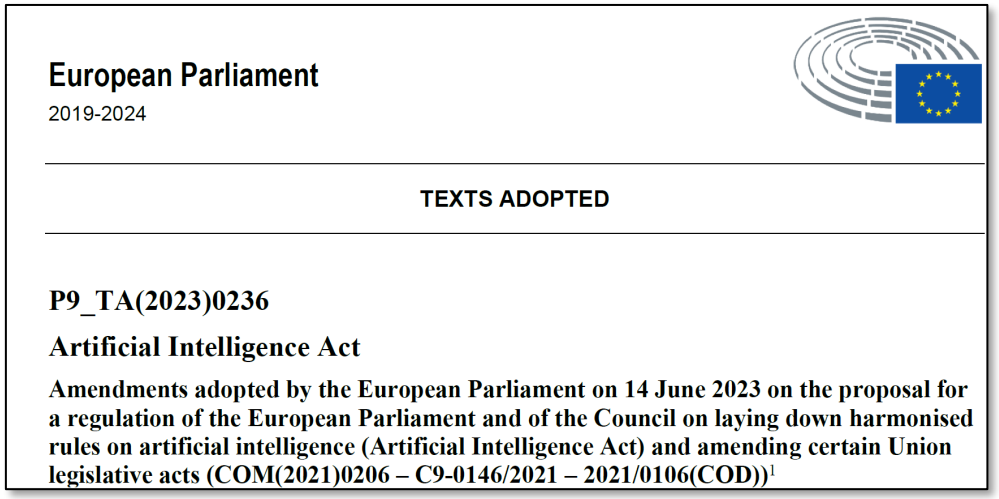
Article 21 - Data collection and statistics

"1. Member States shall collect statistical data to monitor the effectiveness of their systems to combat environmental criminal offences."

Looking ahead, the use of Artificial Intelligence can be considered under the provisions of both Article 18 and Article 21.

It could therefore be useful to define in greater detail, for example through European guidelines, standards for the detection and recording of information relating to environmental crimes that can also be used for the purpose of training AI systems to be used both for investigation and statistical purposes.

Legal Aspects:
Considerations



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Certainly, the need to distinguish between risk analysis against natural persons on the basis of strictly individual elements and prevention and control on the basis of objective data, will require agencies and police that will use artificial intelligence systems for the planning of their activities to adequately motivate the criteria followed in the selection of priorities and companies subject to control.

The problem of distinguishing this limit does not arise, however, where it is the judicial authority that orders the checks in the context of criminal proceedings.

A clarification to this effect is made in recital 18 of the AI Act regarding the prohibition of the use of AI systems for the analysis of recorded footage of publicly accessible spaces through 'post' remote biometric identification systems.

This prohibition shall apply:

"unless there is pre-judicial authorisation for use in the context of law enforcement, when strictly necessary for the targeted search connected to a specific serious criminal offense that already took place, and only subject to a pre-judicial authorisation".

Legal Aspects:

Considerations

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As far as the investigation and trial phase is concerned, at least to us, we do not know of any applications of AI of interest for the search for evidence or for its reinforcement, in the criminal jurisdiction of the environment. One can imagine analysis for the reconstruction of crime chains or temporal sequences, for the search for recurrences and connections between the evidence, for the search for similar conditions or situations that can help in identifying responsibilities or in the reconstruction of the structure of criminal organizations.

Computer Vision applications, such as for the automatized search of possible evidence and/or consequence of specific crimes, a territory level, could be also envisaged.

Quality Standards for AI

It should also be remembered that the results of the analyzes conducted with AI are conditioned by a quantity of factors that should be thoroughly evaluated and estimated in term of impact on all of the procedimental phases of crime tackling.
We should always remember that the rules to be used to provide the required answers are extracted from the sample provided for the training of AI systems. Moreover, these rules are neither known nor verifiable.
For example, excessively old training samples, or not perfectly referred, even spatially, to the situations to be analyzed, can cause a bias of judgment that makes the choices made unreliable.

These uncertainties could compromise the level of credibility of evidence or whatever judicial act based on the use of AI.

Conclusions

The analysis carried out demonstrates the potential of the use of AI, but also the need to delve deeper into various points, also for the benefit of the European environmental legislator, to share experiences, hypotheses and, hopefully, develop common AI logics and, perhaps, tools.

We therefore propose that the 4 Networks give themselves a stable structure for studying the theme, able to set up and develop, starting from a first recognition of the AI tools in use in the Countries of the European Union, a solid support structure for the implementation of the most modern Data Analytics techniques and, more generally, of new technologies among Environmental Authorities.

4 Networks Conference

Cooperation in strengthening environmental enforcement

Rome (IT) 28-29 September 2023

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Thanks for your attention

Pasquale Fimiani and Giuseppe Sgorbati