



CORRECTIONS
TECHNOLOGY
ASSOCIATION

*The Gateway to Innovation
St. Louis, MO*

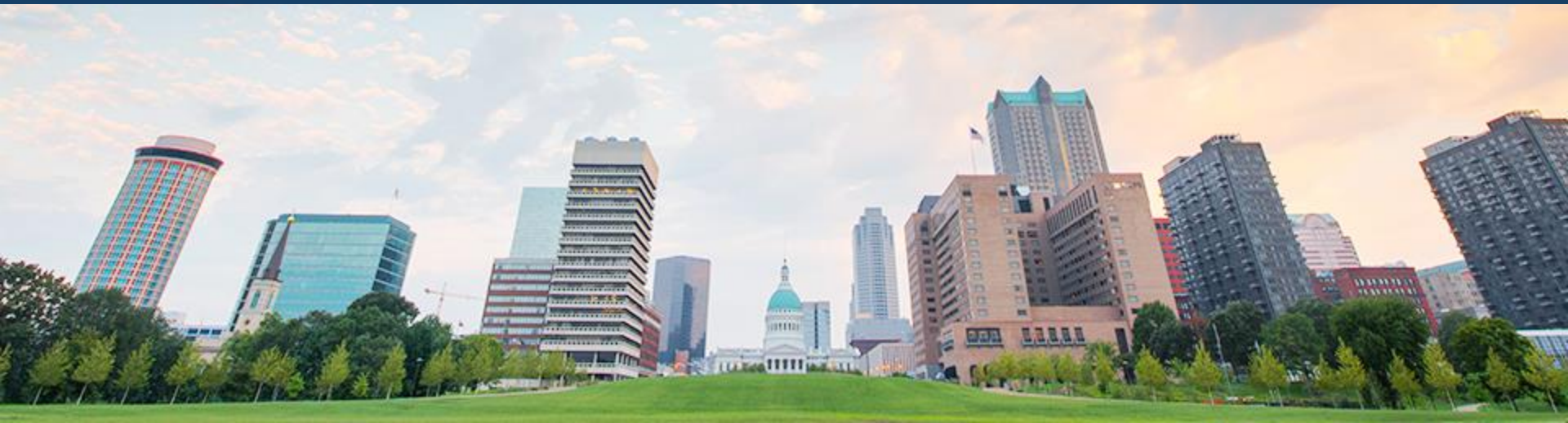
Innovate with Artificial Intelligence -
Opportunities & Challenges

- **Pia Puolakka**, Project Manager, Smart Prison Project
Criminal Sanctions Agency, Finland
- **Steven Van De Steene**, Corrections Technology Consultant & Researcher
The Montfort University (Leicester, UK) – Board Member International Corrections & Prisons Association (ICPA)





A Short Introduction to Artificial Intelligence





Definition of AI

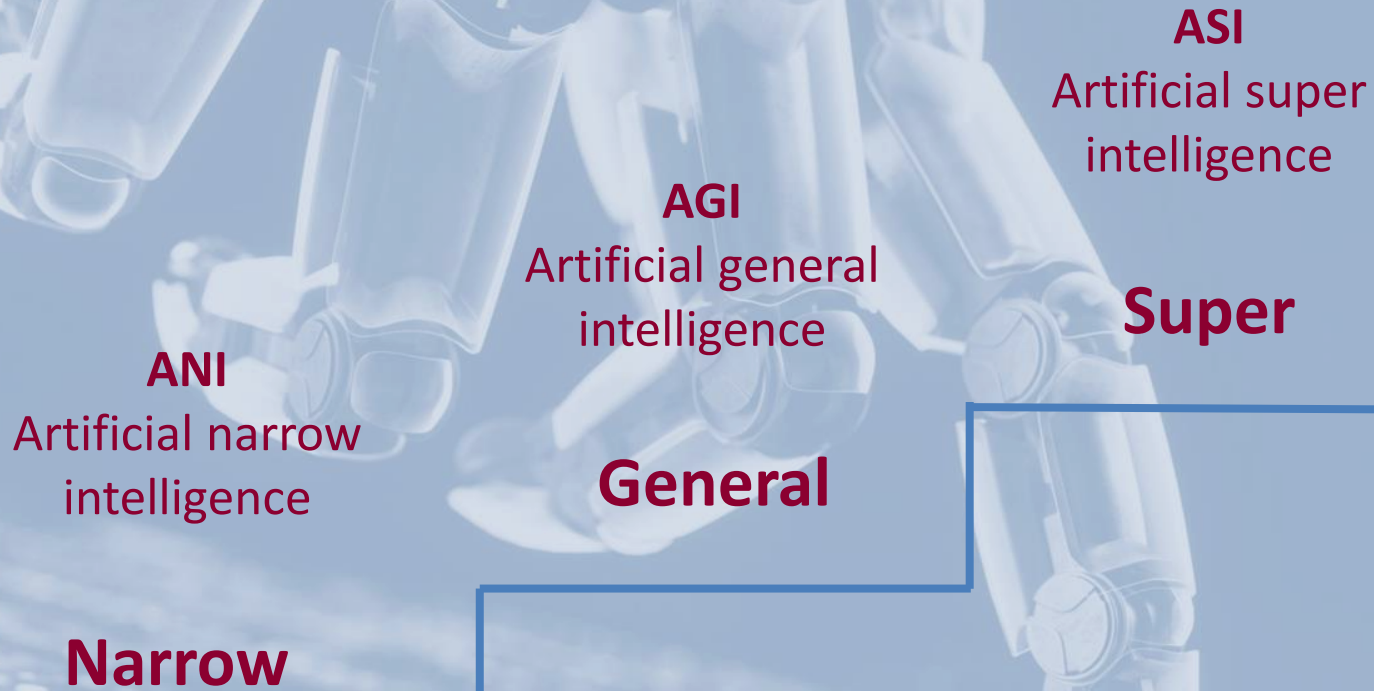
Artificial Intelligence refers to the ability of software and robots to mimic the natural intelligence of humans and other animals.

Colloquially, AI is often used to describe machines that perform "cognitive" functions, such as "learning" and "problem solving".

AI is also a scientific field dedicated to the study and design of artificial agents.



Evolutionary Stages of AI

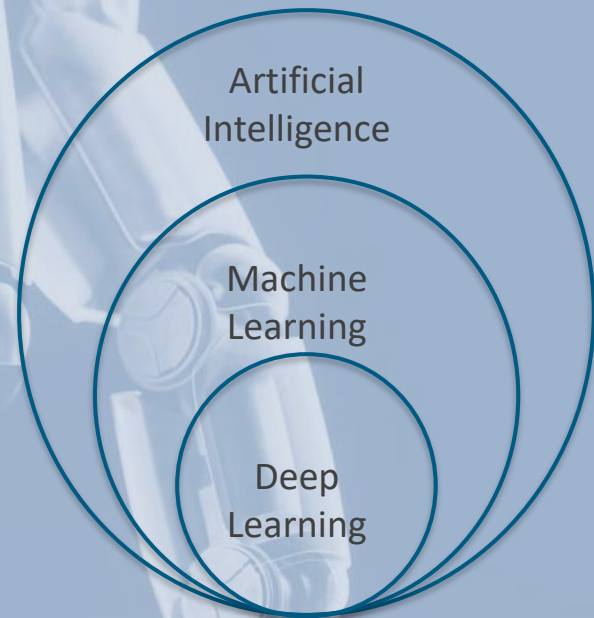




Machine Learning

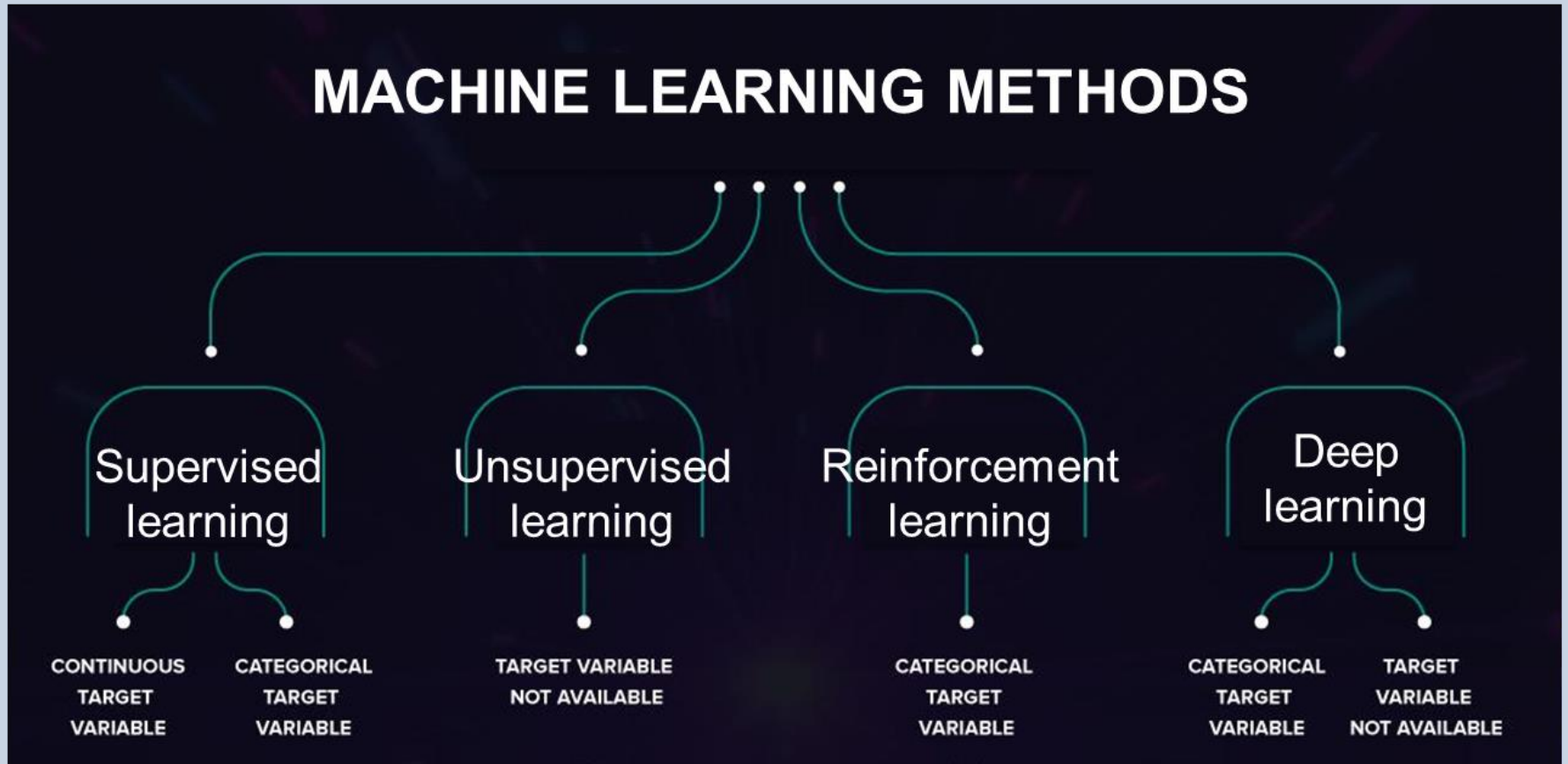
Conventional system development is based on human problem-solving capabilities and programming skills.

With machine learning, algorithms “learn” autonomously how to solve a specific problem by using vast amounts of data and extensive trial-and-error, often producing novel insights and superhuman capabilities.



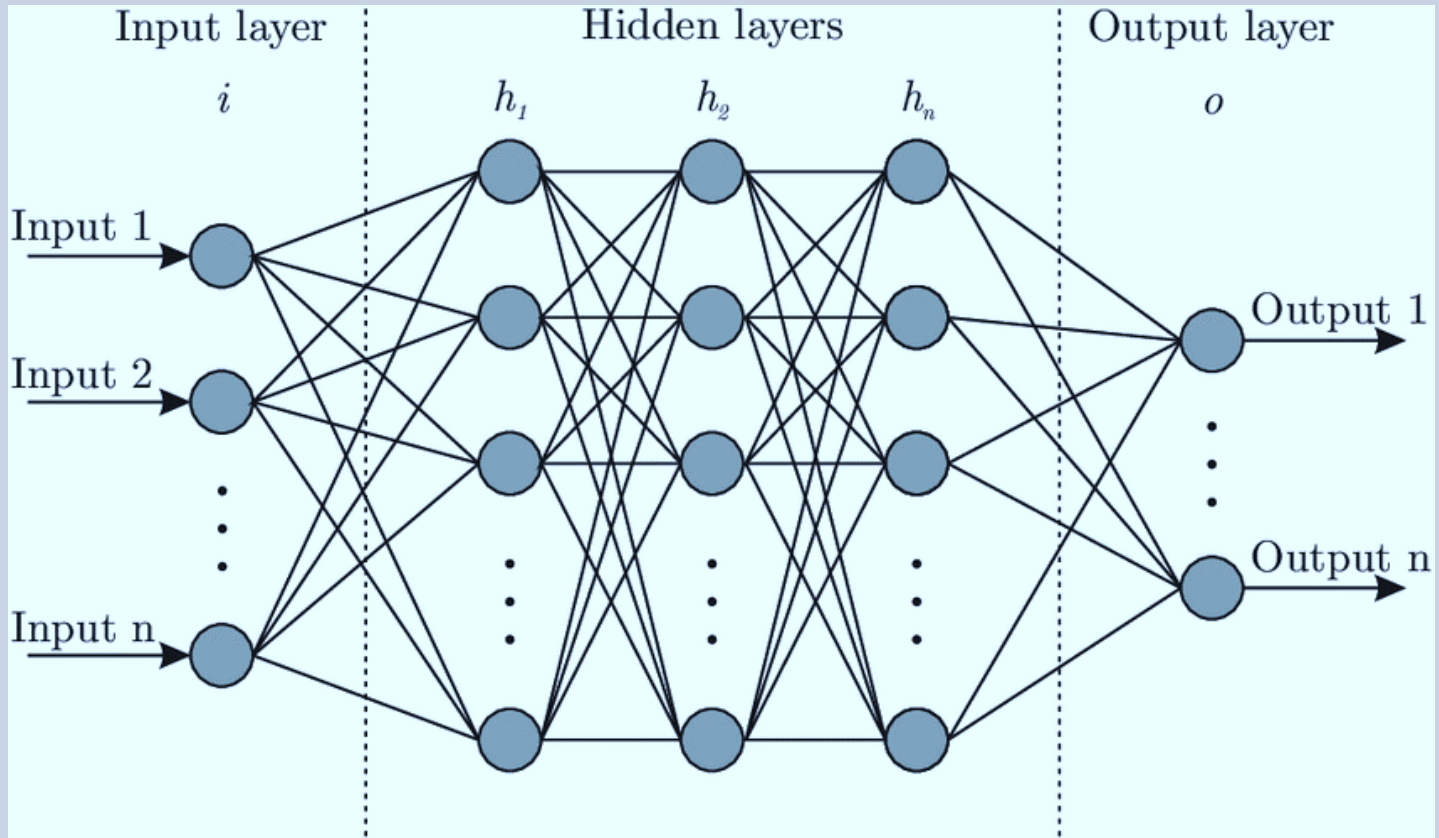


Machine Learning Methods





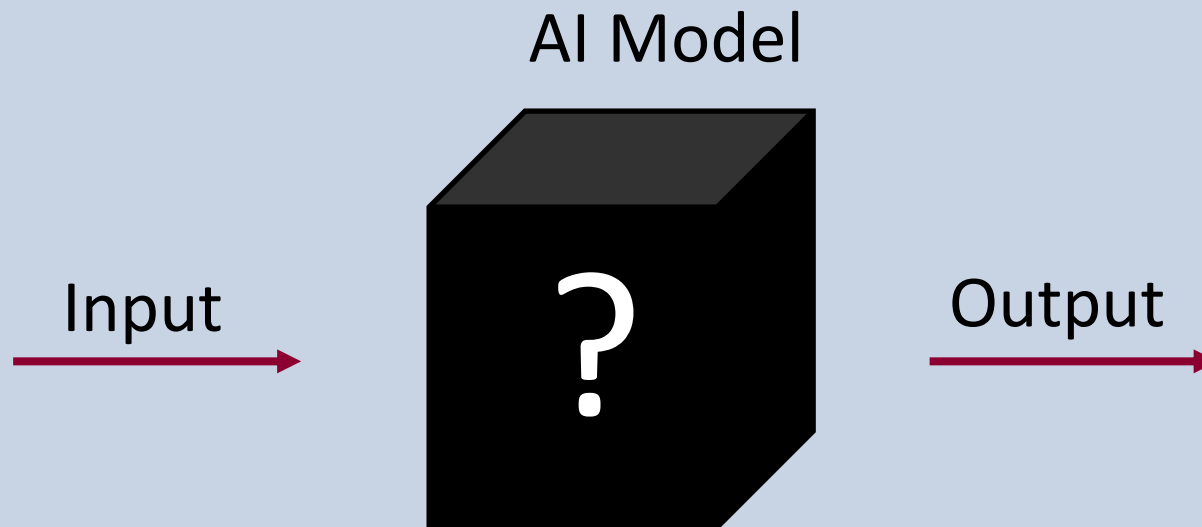
Neural Network





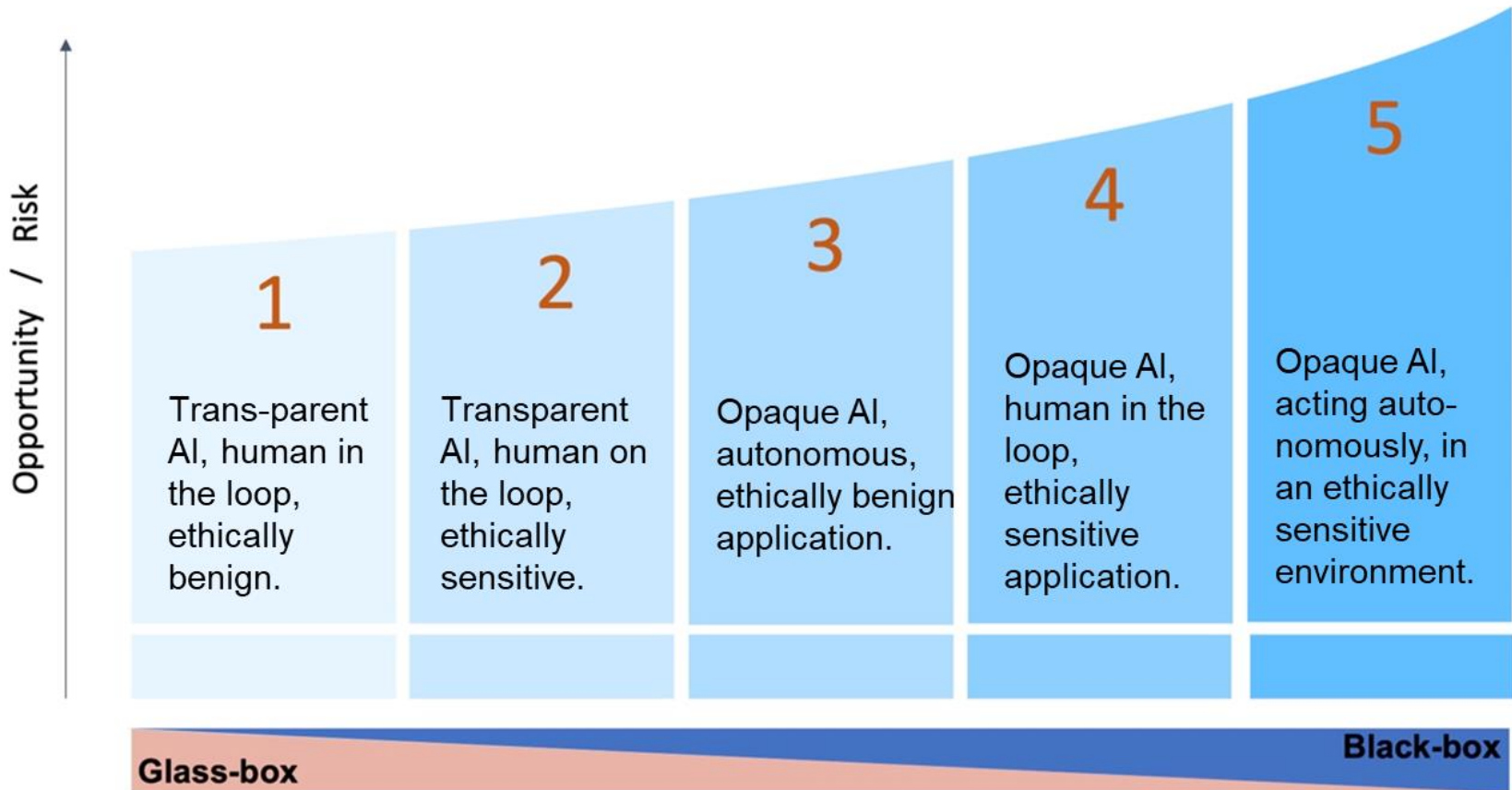
The Black-Box Problem

The tendency of machine learning models, especially neural networks, of becoming incomprehensible to human observers, including its developers.





Levels of AI Implementation





The Finnish Example: RISE AI*



- *Puolakka, P. (2020). *RISE AI: Reducing the Risk of Recidivism with AI*. Aalto Executive Education: Diploma in Artificial Intelligence. Unpublished.
- 'RISE' is short for Rikosseuraamuslaitos, which is the name of the Finnish Criminal Sanctions Agency.



Sentence Planning Process

- Based on the mainly Anglo-American evidence-based research on offending and criminology since the 1990's and the "What Works" debate emerging from it (McGuire, 1999)
 - Risk-Need-Responsivity (RNR) model (Andrews, Bonta, & Hoge, 1990) and assessment of strengths and level of motivation (Good Lives Model GLM by Ward, 2002)
- Database in Offender Management System (OMS): data from official documents, actuarial risk assessment instruments and expert interview

- 1) Assessment:** Risks and strengths
- 2) Planning:** Objectives of the sentence
- 3) Service counselling:** Rehabilitative activities



RISE AI Recommender System

- An algorithm that produces a **list of (1) risk and strength factors, (2) recommendations for sentence objectives and (3) rehabilitative activities and available units (prisons / probation offices)** based on the data from OMS including risk scores and other relevant background factors
- AI-based **expert and recommender system**
- Further development: RISE AI would learn directly from new data and expert analysis and be able to analyze free text fields (**machine learning**)
- An assessment and recommendation **tool** for senior coordinators responsible for the sentence planning process
 - Not automated decision making...
 - ... but looking for the optimal set of activities for each individual offender



RISE AI Input and Output

1) Input data: Risk, strength and other relevant background factors



RISE AI ALGORITHM



2) Output data 1: List of relevant risk and strength factors (1)



3) Output data 2: Recommendations for objectives of the sentence



4) Output data 3: Recommendations for rehabilitative activities + in which units these activities are available (prisons / probation offices)



5) Expert analysis: RISE AI recommendations + expert-based analysis



How Correct is the Algorithm?

- Number of **offenders having complied with the recommendations** made and their progress assessed by the staff
- Number of **participants** in various activities in general
- Number of **refusals** or **interruptions** of activities
- Subjective but structured **feedback** from offenders
- Efficiency of the use of **staff resources** in sentence planning and possible reallocation of these resources
- **Risk assessment** before and after the sentence
- **Recidivism records**



Benefits and Challenges of RISE AI

- **Benefits:** Offenders are directed to services and activities that better meet their risk levels and criminogenic needs, the compatibility of the offenders' needs and their rehabilitation and its impact on the risk of recidivism would thereby improve. Faster and more accurate sentence planning process will also improve quality of sentence time and use of staff and logistical resources.
- **Challenges:** The technical process starts to steer the process too much, to the extent that it excludes the offenders' and experts' analysis. RISE AI is affected by algorithmic discrimination and bias risk similar to other AI-systems: if the prejudices are 'built in' the data, the algorithm will repeat the typical fallacies of human reasoning

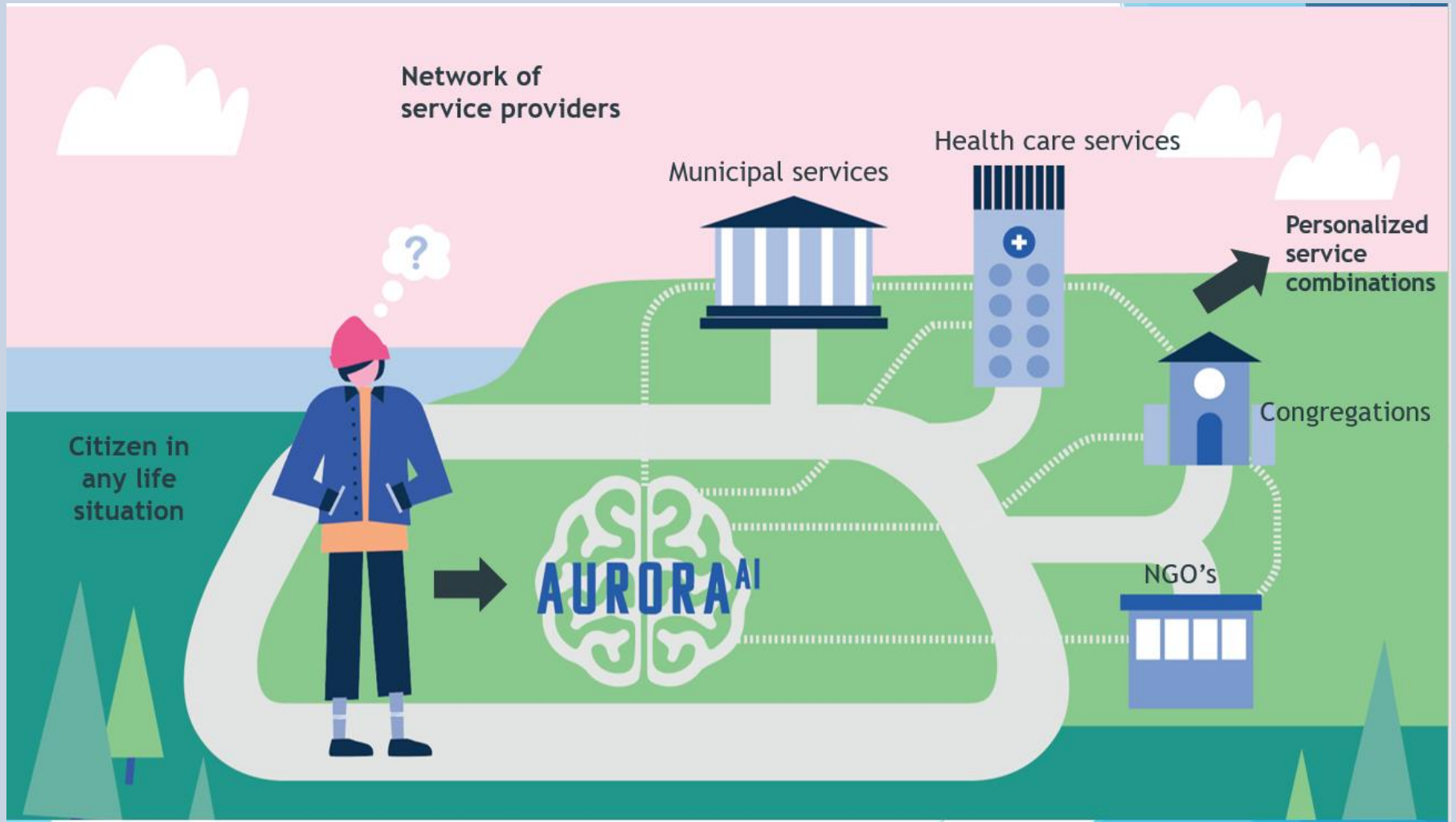


Aurora AI

- **National artificial intelligence (AI) programme:** a recommender system for public services to help citizens and companies find necessary and relevant services in a timely and ethically sustainable manner (Ministry of Finance)
 - Joint platform of public service providers where data (with consent) can be shared between services -> better compatibility between services and clients' multiple needs
 - Service data is managed by the Digital and Population Data Services Agency
- Criminal Sanctions Agency is part of the Aurora AI pilot (2022)
 - Aurora AI portal can be accessed from the joint use workstations in all prisons and probation offices
 - Target group: **young offenders**

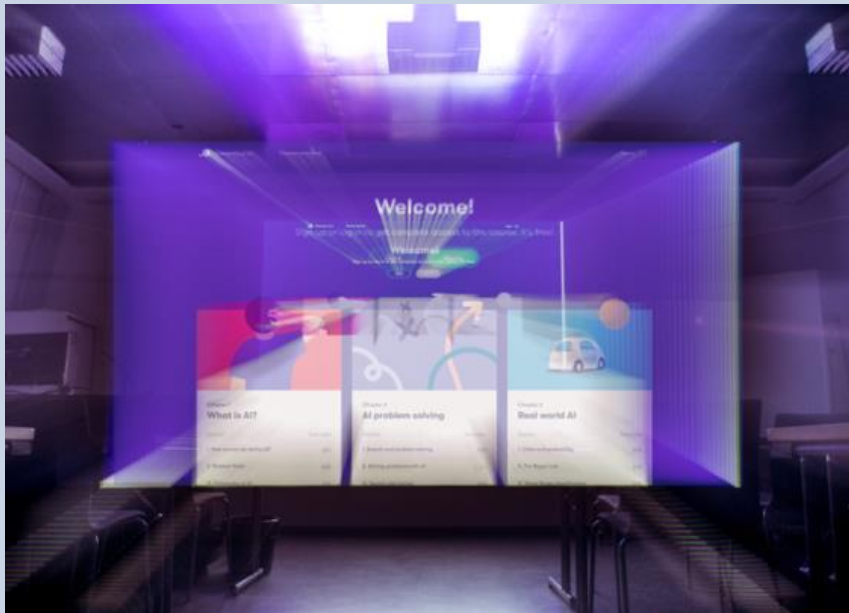


Aurora AI





Learning AI



- Online courses (3) on the basics and ethics of AI and some basics of coding (Python) provided by Helsinki University and Reaktor Inc.
- Available online for offenders in all prisons and probation offices in Finland
- AI literacy and advanced digital and cognitive skills
- Possibility for group courses in prisons

<https://www.elementsofai.com>



Learning AI

The screenshot shows a web browser displaying the 'Elements of AI' course overview page. The page has a dark blue header with the 'cta' logo and the text 'Learning AI'. Below the header, the browser address bar shows 'course.elementsofai.com'. The main content area is a grid of six chapter cards, each with a colorful header image and a table of sections and exercises.

Elements of AI | Course overview | Menu

Chapter 1: What is AI?

Section	Exercises
I. How should we define AI?	0/1
II. Related fields	0/2
III. Philosophy of AI	0/1

Chapter 2: AI problem solving

Section	Exercises
I. Search and problem solving	0/2
II. Solving problems with AI	---
III. Search and games	0/1

Chapter 3: Real world AI

Section	Exercises
I. Odds and probability	0/2
II. The Bayes rule	0/2
III. Naive Bayes classification	0/2

Chapter 4: Machine learning

Section	Exercises
---------	-----------

Chapter 5: Neural networks

Section	Exercises
---------	-----------

Chapter 6: Implications

Section	Exercises
---------	-----------



Training AI

- Training AI algorithms as prison work in four prisons (including one women's prison)
- In collaboration with a software company
- Training material includes text material on real estates
- Prisoners learn digital and cognitive skills
- Alternative work form to prisoners unable to participate in more physical or group work



Training AI

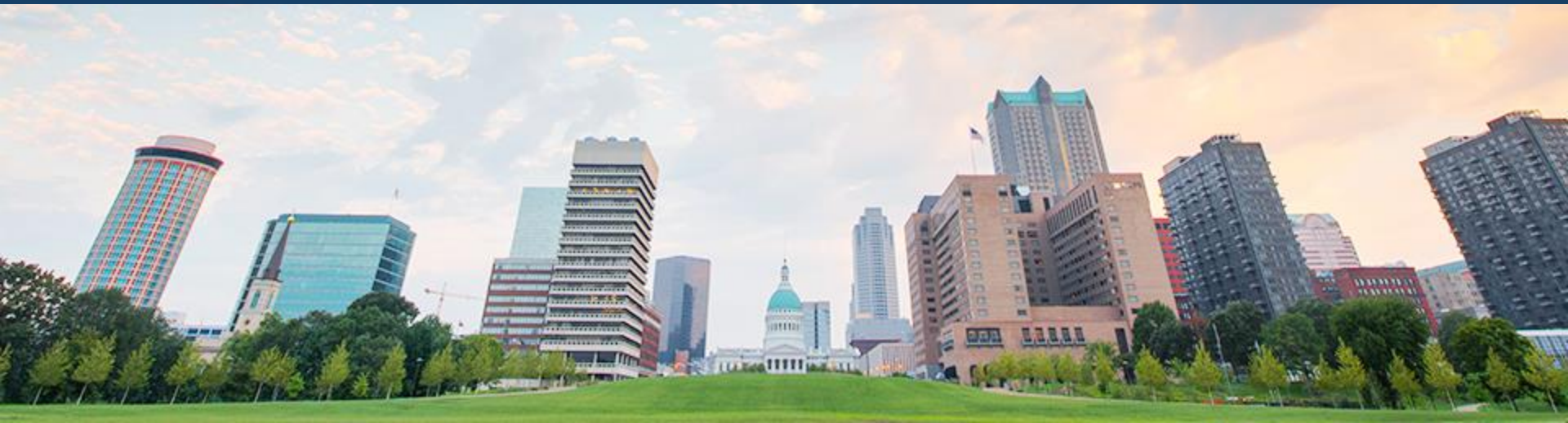




- **Business Insider:** At prisons in Finland, inmates are learning AI and taking online tech courses as a bridge to life on the outside.
<https://www-businessinsider-com.cdn.ampproject.org/c/s/www.businessinsider.com/finland-prisons-technology-ai-online-classes-2020-8?amp>





Ethical Design Principles
&
Shaping Rules on AI EU - USA

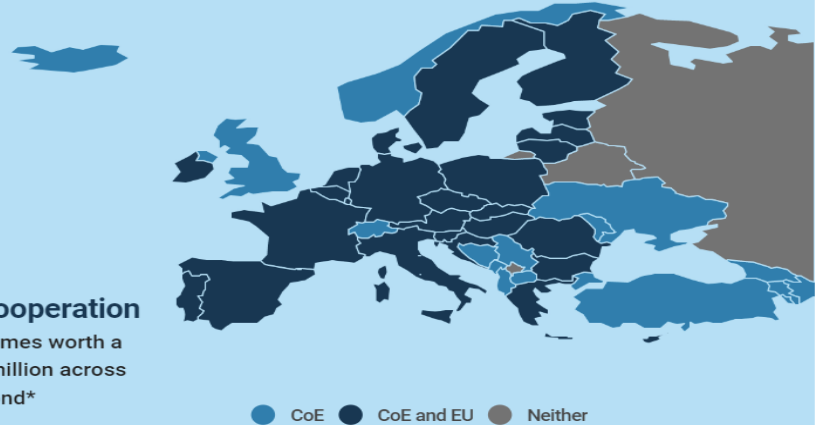




Council of Europe and the EU

The Council of Europe and the European Union

<u>Council of Europe</u>		<u>European Union</u>
1949	<i>Established</i>	1957
46	<i>Member states</i>	27
700 million	<i>Population</i>	448 million
	<i>Flag</i>	
Ode to Joy	<i>Anthem</i>	Ode to Joy



Legal cooperation

The EU participates in 12 CoE conventions and several of its specialised bodies.



Technical cooperation

47 joint programmes worth a total of €207.5 million across Europe and beyond*
*As of 03/05/2022

Share



- CoE: 46 Member States – 6 observing states (US, CA, Mex, Japan, HS and Israel)
<https://www.coe.int/en/web/artificial-intelligence>

CAHAI → CAI → Legal Framework on AI design, development & application

White paper on AI in Corrections...



Legislation EU - USA



POLICY AND LEGISLATION | Publication 21 April 2021

Proposal for a Regulation laying down harmonised rules on artificial intelligence



Agency-by-Agency

Department Of Commerce – NIST – **Voluntary:**

- AI Risk management Framework (AI RMF) National
- Artificial Intelligence Advisory Committee (NAIAC)

White House – EU/US Trade : adopt CoE Framework



Ethical Charter EU

- Principle of respect for fundamental rights
- Principle of non-discrimination
- Principle of quality and security
- Principle of transparency, impartiality and fairness
- Principle “under user control”



Legal Boundaries on Capturing & Using Data

General Data Protection Regulation (GDPR) (in US not existing - only on State level similar regulations)

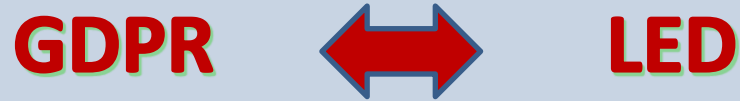
Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

Law Enforcement Directive (LED) in US non - existing. Federal law that is applicable is still based on Electronic Communications Privacy Act (ECPA) from 1986

Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data.



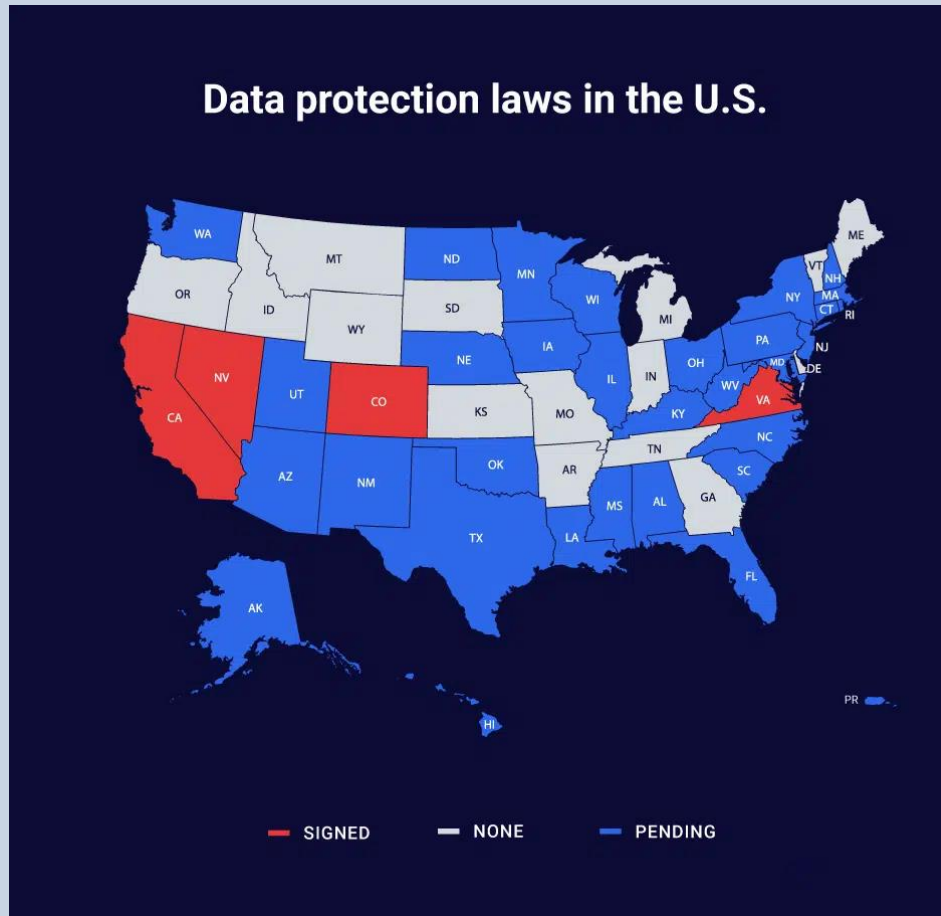
Legal Boundaries on Capturing & Using Data



- The processing of personal data by data controllers for the purpose of law enforcement falls outside of the scope of the GDPR.
- This is dealt with by the **Law Enforcement Directive (LED)**.
- The LED is a Directive rather than a Regulation, the LED does not have direct effect and therefore requires to be transposed into **Member States' domestic law**.



Legal Boundaries on Capturing & Using Data





LED principles

Purposefull collection of data:

- 1) Collected for specified, explicit and legitimate purposes
- 2) Adequate, relevant and not excessive in relation to those purposes

Accurate & limited in time

- 1) Accurate and kept up to date
- 2) Erased or rectified without delay
- 3) Permits identification of data subjects
- 4) For no longer than is necessary
- 5) Ensures appropriate security



→ **Ethical Design Principles** (Knight & Van De Steene, 2020)

- ▶ Legal: assure you have a clear legal base on what you do digitally
- ▶ Privacy and transparency: see earlier + be transparent!
- ▶ Normality - new normal is digital
- ▶ Equality and fairness - accessibility, digital literacy, affordability, ...
- ▶ Proportionality: e.g. security measures
- ▶ Agency: don't compromise/reduce human agency



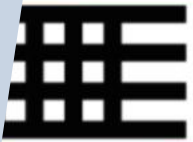
Beccaria (18th century) - Relevant for AI?

1. Enact laws that are clear, simple, unbiased and reflects the consensus of the population.
2. As few restrictions on individual freedom as possible.
3. Educate the public.
4. Eliminate corruption from the administration of justice.
5. Reward virtue.
6. Justification of punishment is rehabilitation, not revenge, and to protect individual rights.
7. Punishment must be proportionate and strictly limited (should not exceed the harm done).
The evil inflicted on an offender should exceed the advantage gained from crime (but beyond this it is ineffective and tyrannical).
8. Penalties should correspond with the nature of the offence and its extent in society.
9. Punishment should be certain and speedy. Deterrence is more effective if it is certain, fast and mild.
10. Exemplary punishment (e.g. public execution) should be prohibited.
11. All deserve the same punishment for the same crime.
12. It is better to prevent crimes than to punish them.



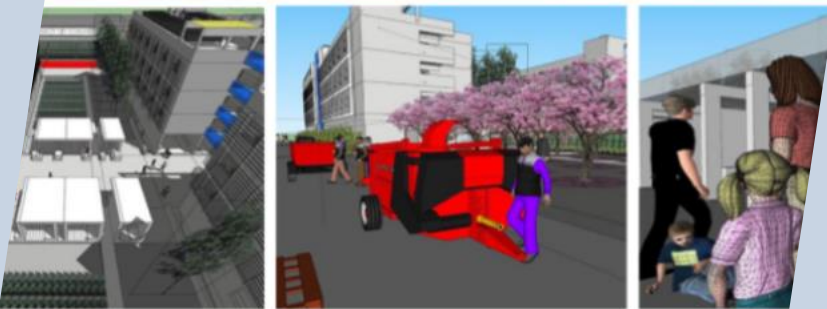
Questions - Dialogue

1. Are those principles helpful in your day-to-day practice?
2. What will you do when your DG asks you to put 24/7 image, pattern and voice recognition algorithms in all your CCTV systems & body worn camera's?
3. What will you do when your DG asks to implement an AI driven tool for assessing offender risks?



ADVANCING CORRECTIONS

Journal of the International Corrections and Prisons Association



Puolakka P., & Van De Steene, S. (2021). Artificial Intelligence in Prisons in 2030. An Exploration on the Future of Artificial Intelligence in Prisons. *Advancing Corrections Journal*, Edition #11, ICPA.

<https://icpa.org/17417-2/>



References


- European Commission for the Efficiency of Justice (CEPEJ): *European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their environment* <https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c>
- *General Data Protection Regulation* (GDPR): Regulation (EU) 2016/679. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016R0679>
- Directive (EU) 2016/680 - known as '*The Law Enforcement Directive*'. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L0680>
- Knight, V. & Van De Steene, S. (2020) The digital prison: Towards an ethics of technology. In: Birch, P., Sicard, L. (Eds.) *Prisons and Community Corrections*. London: Routledge.
- Puolakka P. (2022). Smart Prison: From Prison Digitalisation to Prison Using, Learning and Training Artificial Intelligence. *Justice Trends*, Edition #8. <https://justice-trends.press/smart-prison-from-prison-digitalisation-to-prison-using-learning-and-training-artificial-intelligence/>
- Puolakka P., & Van De Steene, S. (2021). Artificial Intelligence in Prisons in 2030. An exploration on the future of Artificial Intelligence in Prisons. *Advancing Corrections Journal*, Edition # 11, ICPA.



Thank you!

Pia Puolakka


pia.puolakka@om.fi


 @Piapuolakkaomf1

 /pia-puolakka-8218a9b3/

Steven Van De Steene

steven.vandesteene@dmu.ac.uk

 @vdststev

 /stevenvandesteene/

