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ARTIFICIAL INTELLIGENCE IN A PRISON ENVIRONMENT

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AGENDA

- What is Artificial Intelligence?
- Why is it important?
- Machine learning
- Deep learning
- A.I. in prisons: Examples
- EU Commission on thrustworthy AI
- Risks
- Q & A


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WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial Intelligence is the **simulation of human intelligence processes** by **machines**, especially computer systems. These processes include **learning** (the acquisition of information and rules for using the information), **reasoning** (using rules to reach approximate or definite conclusions) and **self-correction**. particular applications of AI include expert systems, speech recognition and machine vision. (source 'techtarget.com')

WHY IS AI IMPORTANT?

- AI automates repetitive learning and discovery through data
- AI adds intelligence
- AI adapts through progressive learning algorithms
- AI analyzes more and deeper data
- AI achieves incredible accuracy
- AI gets the most out of data

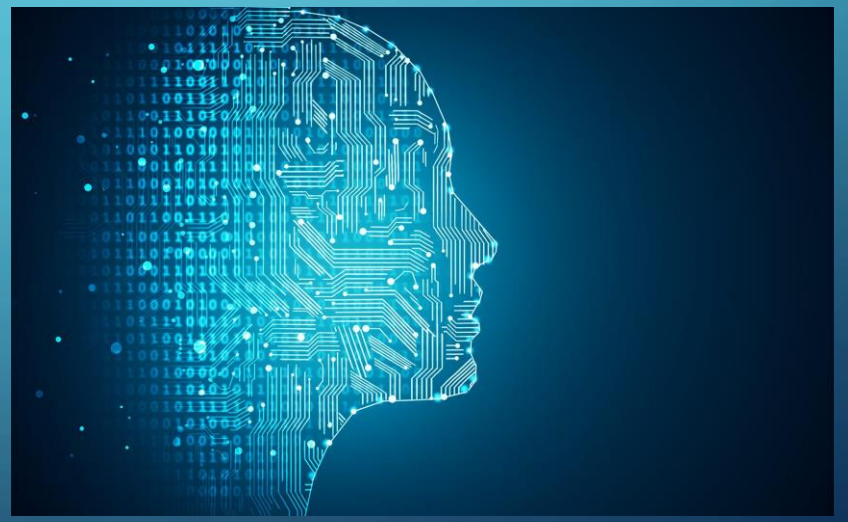
MACHINE LEARNING

Provide systems the ability to **automatically learn and improve from experience** without explicite programming.

- **Supervised** machine learning algorithms
- **Unsupervised** machine learning algorithms
- **Semi-supervised** machine learning algorithms
- **Reinforcement** machine learning algorithms

Need of data by example:

- Granular data
- Large volumes of data
- Extremely diverse data



DEEP LEARNING (SUBSET OF MACHINE LEARNING)

Deep learning is an Artificial Intelligence function that **imitates the workings of the human brain** in processing data and creating patterns **for use in decision making**. Deep learning is a subset of machine learning in Artificial Intelligence that has **neural networks** capable of learning unsupervised from data that is unstructured or unlabeled. (source 'investopedia.com')

DIFFERENCE BETWEEN MACHINE AND DEEP LEARNING

MACHINE LEARNING uses algorithms to parse data, to learn from that data and make informed decisions based on what it has learned, but still need guidance of a human.

DEEP LEARNING structures algorithms in layers to create an 'artificial neural network' that can learn and make intelligent decisions on its own without human interaction.

ARTIFICIAL INTELLIGENCE IN PRISONS

Example 1

- **TECHNOLOGICAL INCARCERATION PROJECT (Swinburne university's law school, Melbourne)**

Form of home detention, using Artificial Intelligence, machine-learning algorithms and lightweight electronic sensors and cameras to monitor convicted offenders on a 24-hour basis.

A combination of different technologies and a vast amount of data can predict various situations where the offender is in violation of his home detention, and the system is able to start automated procedures to prevent specific actions from the offender or alert officials and/or law enforcement.

ARTIFICIAL INTELLIGENCE IN PRISONS

Example 2

- **PRISON CELL ALLOCATION**

AI can take in account much more variables than humans to place offenders in the most appropriate cell with the most compatible co-offenders (Bayesian algorithm and Optimal distance algorithm)

* The one-sided of cell allocation
* Lack of scientific guidance
* Influence of the uncertainties of allocation result

ARTIFICIAL INTELLIGENCE IN PRISONS

Example 3

- **USING AI TO COMBAT CONTRABAND IN PRISON**

Because AI is brilliant at recognizing patterns, which means they can pick out anomalies.

Altcourse prison in Liverpool (UK) uses security cameras monitored by AI (software by Avigilon Corporation) to stop contraband (but also drugs and weapons) getting into prison.

The video analytics software detects suspicious behavior but also detects items being recognized as phones, drugs or weapons.

ARTIFICIAL INTELLIGENCE IN PRISONS

Example 4

- USING AI TO DETECT INMATES GETTING IN A FIGHT OR TRYING TO ESCAPE

A police station in Malaysia has a new system that can detect if inmates get into a fight or try to escape by using new video analysis techniques.

The smart lock-up system analyses footage from surveillance cameras in cells, corridors and along the prison's perimeter, detecting behavior like climbing, loitering, fighting, suicide attempts and vandalism. It then sends an alert to the authorities.

The system is based on Artificial Intelligence, using "Gait Analysis" to teach a computer to analyze human motion and behavior.

ARTIFICIAL INTELLIGENCE IN PRISONS

Example 5

- USING AI TO DETECT SECRET WORDS USED IN PHONE SYSTEM

A US prison was recently able to detect and prevent inmates from carrying out illegal business by using Artificial Intelligence to analyze calls made into and out of the prison for unusual patterns.

The use of a machine learning system designed by London-based firm Intelligent Voice to listen to all the audio files and detect odd patterns for humans to take a closer look at.

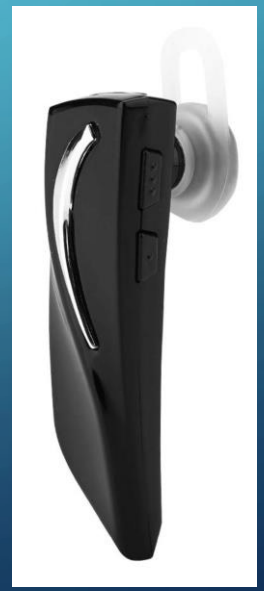
Intelligent Voice works by indexing key words and phrases from phone calls, so that prison wardens can then search for keywords in the telephone calls as if they were text, instead of audio.

The software reaches 88% accuracy which is far higher than human score.

ARTIFICIAL INTELLIGENCE IN PRISONS

Other examples

- Using AI for health checks
- Using AI as chatbots
- Using AI for pattern checks in mail messages
- Using AI for real time translations (Travis, Smart translator,…



ETHICS GUIDELINES EU COMMISSION ON AI

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- **Trustworthy AI** should be:
  - Lawful: not covered in guidelines
  - Ethical: principles
  - Robust: technical and non-technical

- **Requirements** for trustworthy AI
  - Human agency and oversight
  - Technical robustness and safety
  - Privacy and data governance
  - Transparency
  - Diversity, non-discrimination and fairness
  - Societal and environmental well-being
  - Accountability

- **Next steps**:
  - Piloting process to gather feedback
  - Forum discussions

https://ec.europa.eu/futurium/en/ai-alliance-consultation/guidelines

COE: 10 STEPS TO PROTECT HUMAN RIGHTS

- Human rights impact assessment
- Public consultations
- Facilitate implementations of human rights in private sector
- Information and transparancy
- Independent oversight
- Non-discrimination and equality
- Data protection and privacy
- Freedom of expression, assembly and association, and right to work
- Remedies
- Promote AI literacy

RISKS (SOME …)

- **Deepfake**
- **Putting to much trust in AI**
- **Cyber Crime**
- **Fake news and Propaganda**
- **AI could make weapons more destructive**
- **Ethical issues**
    - Unemployment
    - Inequality
    - Humanity
    - AI bias
    - Evil genies
    - Singularity
    - Robot rights
    - Data privacy
- **Legal issues**

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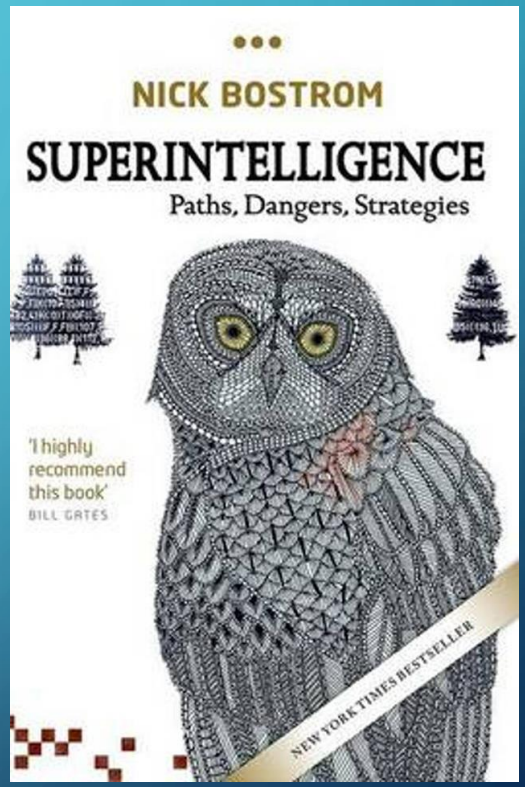
Q & A



Please visit www.priscat.com
The Prison Technology Catalogue