

# General Trends in Artificial Intelligence: An Overview from the Perspective of the Law

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- What's AI?

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- Two angles (that interact, of course):

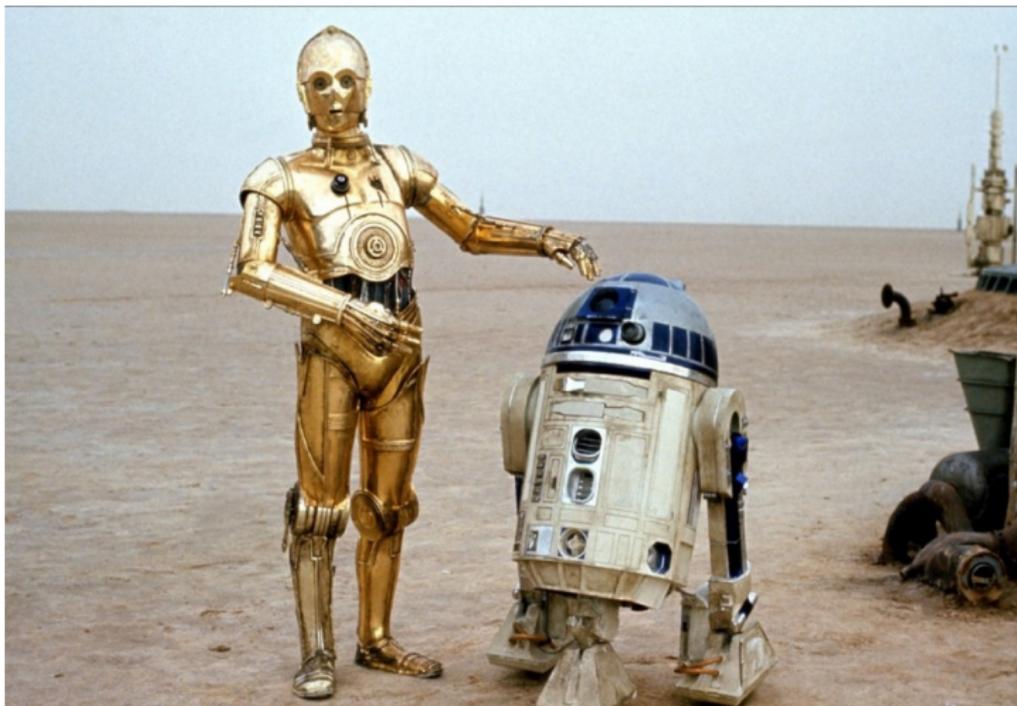
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- Old and new challenges (AI for the law)

# What's AI?

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# What's AI?

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# What's AI?



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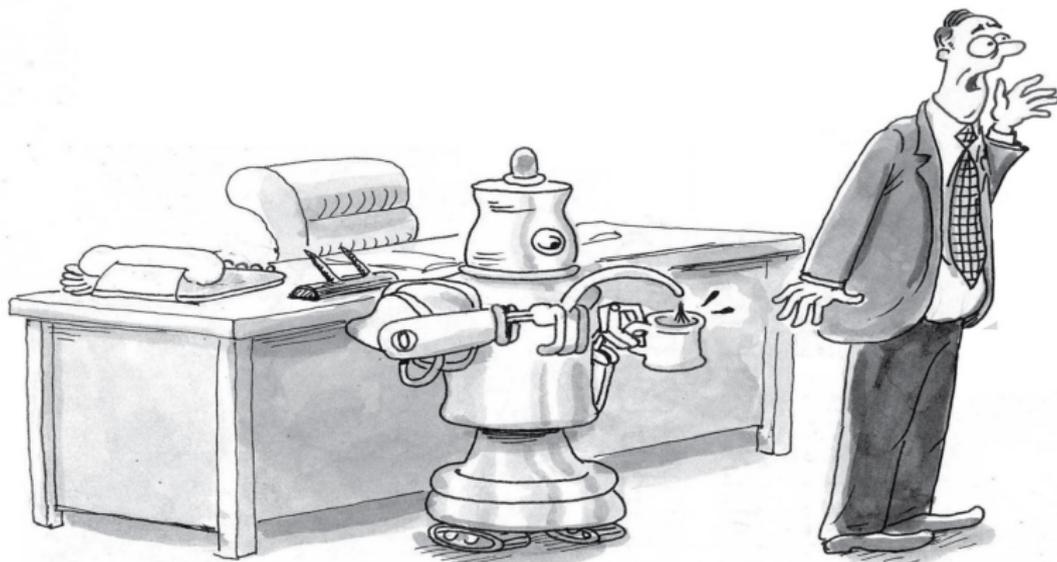
Among other things:

- **Autonomy:** AI will be delegated the more or less autonomous execution of various task;
- **Learning:** AI's ability to automatically learn and improve from experience without being explicitly and fully programmed;
- **Social:** AI may consist of multiple interacting intelligent agents such that actions are decentralised.

# Part I

## From the the law to AI

# The law for AI



“Is it harassment if I ask the new guy  
to make espresso?”

# The law for AI: classic and new topics

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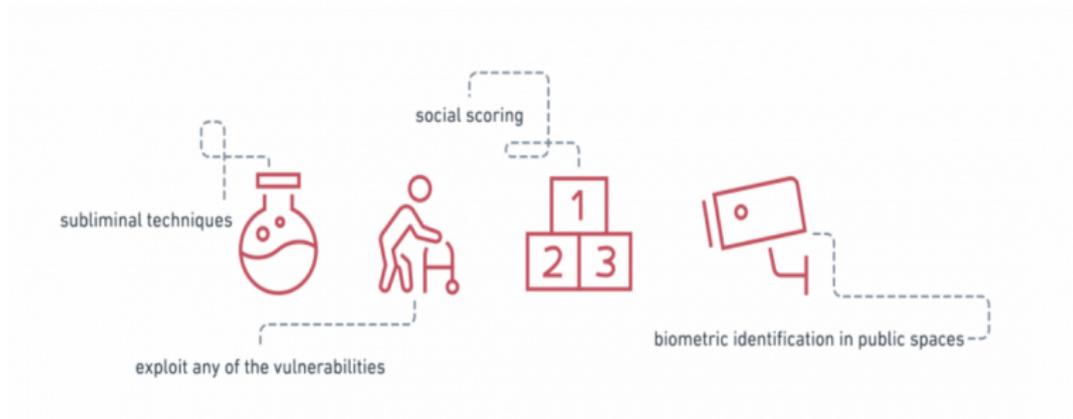
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- cybersecurity vulnerabilities,
- unfairness, bias and discrimination,
- lack of contestability.

## Challenge

*How we can ensure that AI complies with norms applicable to it? How can we design a system such that it complies with a given set of norms?*

# The law for AI: hot trends - EU AI Act and beyond

## What's Prohibited?



**Risk Assessment Approach (the role of insurance companies, etc....):**  
emphasis on the concept of *high risk systems*, i.e., AI systems relating to:

- biometric systems;
- critical infrastructure and protection of the environment;
- education and vocational training;
- employment, workers management and access to self-employment;
- access to and enjoyment of private services and public services and benefits; law enforcement;
- migration, asylum and border control management; and administration of justice and democratic processes.

# Part II

## From AI to the law

- **A paradigm change:** from human-made representations of knowledge to **machine-made models**;

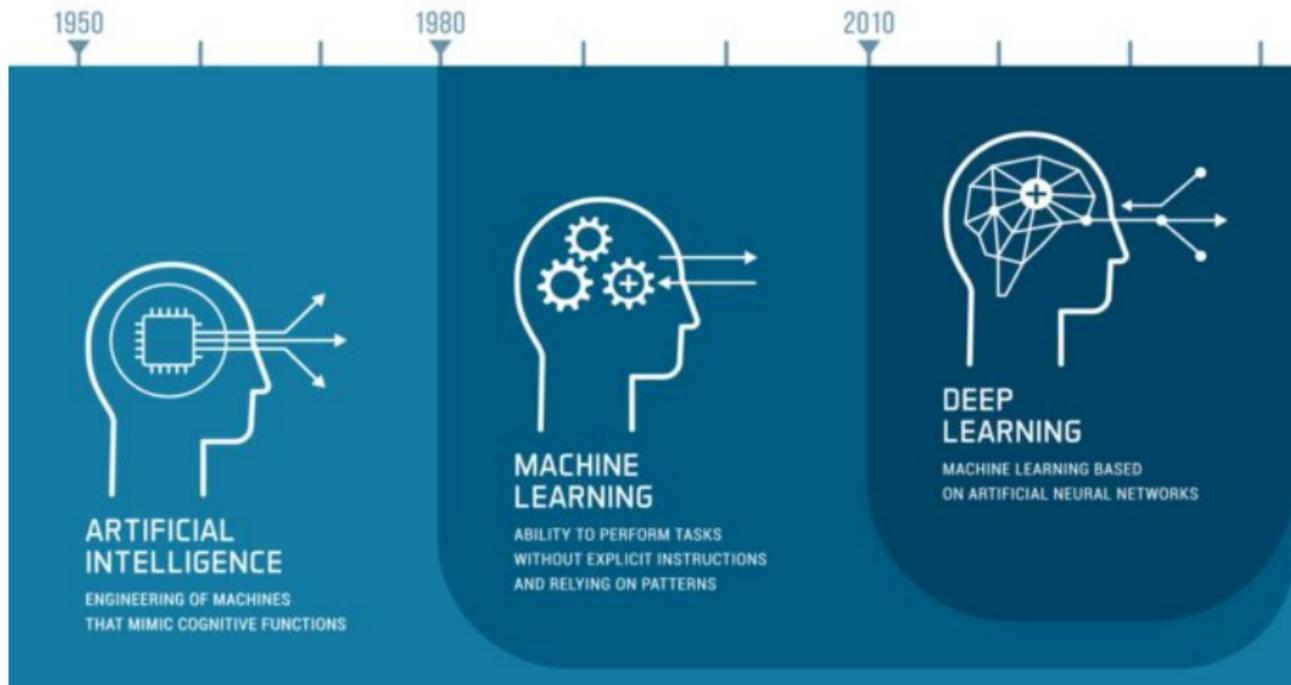
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- On machine learning approaches, machines are provided with learning algorithms and vast sets of examples (training sets), rather than, or in addition to, formalised knowledge;
- No longer a sequence of steps each of which links meaningful premises to reasonable conclusions, but rather performance of complex **multilayered computations that are meant to capture the statistical correlations** between input features and predicted outcomes.



# Machine learning



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Legal conclusions are derivable from valid norms and true facts:

- Let  $D$  be a set of norms and  $\mathcal{F}$  be a set of factual statements. A legal conclusion  $\phi$  (an obligation, a permission, the validity of a contract, etc.) holds in a situation  $\mathcal{F}$ , iff  $D \cup \mathcal{F} \vdash \phi$

# Once upon a time? Knowledge-based systems and the law as a rule-based system

## Challenge (Again, compliance by design)

*Explain which of the following choices should be made in AI: (a) norms must be explicitly represented in systems in a declarative way, or (b) norms must be explicitly represented in the overall system specification.*

# Once upon a time? Knowledge-based systems and the law as a rule-based system

## Challenge (Norms and compliance)

*Make explicit why your norms are a kind of constraint that deserve special analysis.*

## Challenge (Compliance and maintenance of normative constraints)

*Why and how can norms be changed at runtime?*

# Complexities of the legal domain

- **Top-down and bottom-up**: centralised law-making and customary law
- **Norm hierarchies**: power-conferring norms
- **Regulated norm change**: legal norms regulating how to change the law
- **The role of legal enforcement**: institutionalised and centralised enforcement → positive and negative feedbacks.

# Time and norms

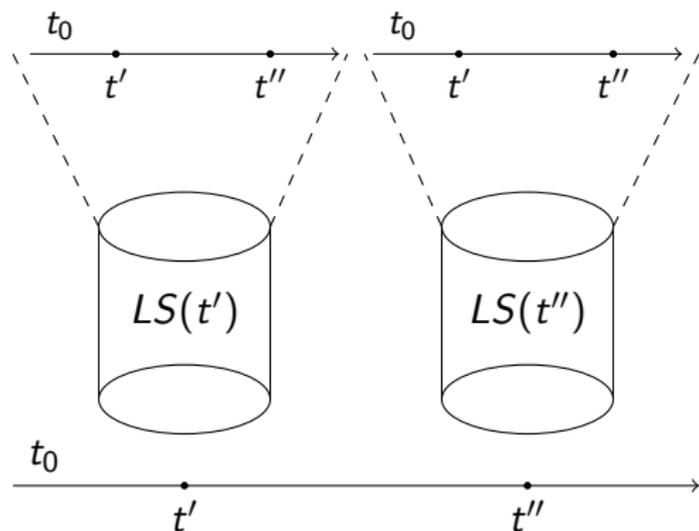


Figure: Legal System at  $t'$  and  $t''$

- A norm is a kind of system constraint:

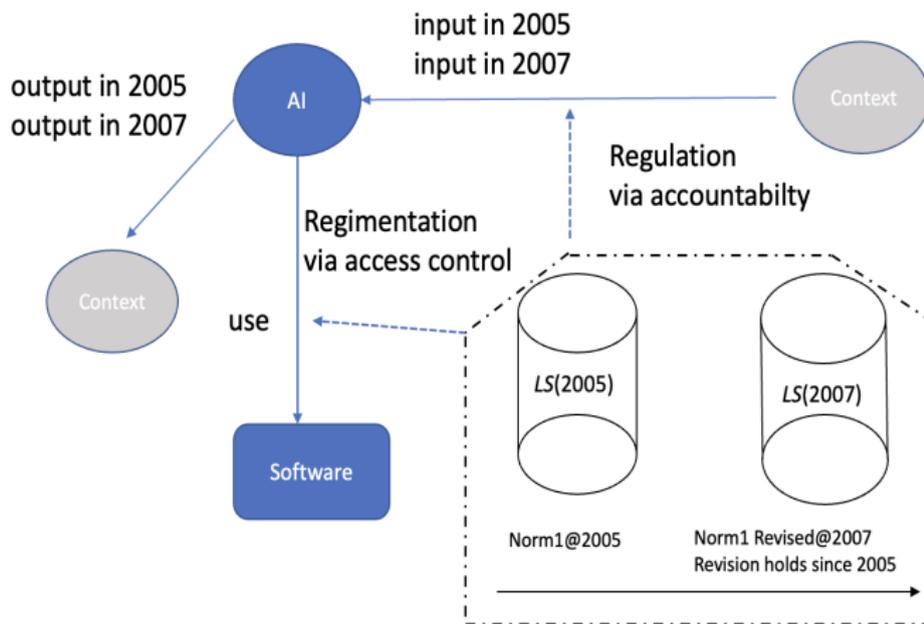
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  - Norms as soft constraints are used in detective control systems where violations can be detected (**regulation**).

# Compliance and normative dynamics



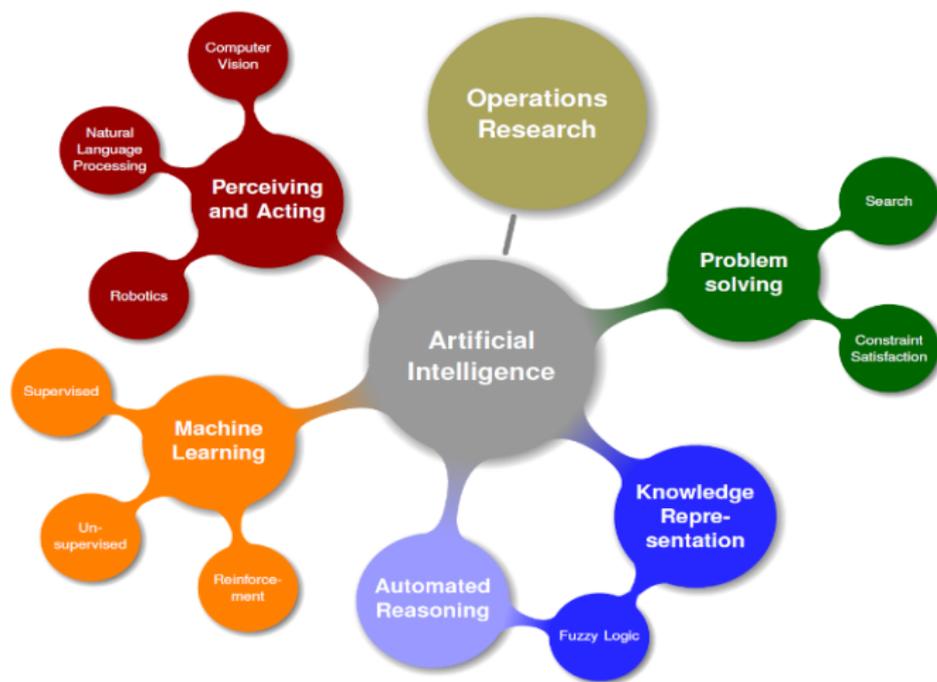
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# Hybrid AI





Many thanks!

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