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Towards a robotic law algorithm?

How to regulate?
Why all the confusion?
What is wrong with Law?
What are the tools?

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What is AI?

What is law?

What is there to regulate?

How to regulate?

What are the tools?

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What is AI?

Opinions of AI differ. Bright, sceptic and dystopian outlooks flourish and sometimes arguments clash.
It is easy to be bewildered, but what is AI, and why are there so many views?

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What is AI? (1)

AI is depending on knowledge from many fields and AI research is in principle borderless. Digital technique and computers are core elements, but also input from cognitive, social, ethical and legal sciences must be acknowledged.

Development projects are often initiated within established administrative frameworks and traditional structures - and sometimes unintentional silo-mentality may explain what appears to be varying opinions, e.g. about how to prioritise and allocate resources.

Different understandings and expectations also appear in the meeting between AI and law. Although confusion and misunderstandings usually are possible to sort out, it is important to understand that AI involves a large number of stakeholders with different objectives and backgrounds. *AI is an open, multifaceted field of research.*

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What is AI? (2)

AI is seldom described in a uniform manner. The terminology is often of a technical nature, difficult to grasp for the non-expert, and when AI is to be integrated in various settings, each may have its own methodological tradition and jargon.

This is also a common complication in the meeting between AI and law. Deep learning, predictive modelling, autonomous algorithms, deontic logic, theological interpretation and privacy by design are just a few examples. Difficulties of this kind are possible to overcome, but it takes time to acquire proficiency and *AI is depending on a large variety of methodological developments.*

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What is AI? (3)

AI devices manifest themselves in many ways. Some applications are easy to spot and understand.

AI components can however also be intangible and exist only as computer code. The functions may be concealed from the outside and integrated as tacit sub-processes in systems of systems, working with various degrees of autonomy at different levels.

Thus, AI is not a well-defined wonder. On the contrary, AI applications are uncountable and so are purposes and consequences, existing and potential. In its operative modes *AI is a significantly diverse phenomenon.*

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What is AI? (4)

The concept of *intelligence* is crucial but intricate. It is commonly accepted that intelligence is a collective name for a large number of identifiable faculties. AI theorists have however suggested that intelligence merely is a name for processes which are poorly understood and yet not programmed.

Subsequently, as our knowledge increases, the concept of intelligence is changing its meaning. From this follows that also AI is a moving target.

Many functions and apps, resulting from AI research and currently available in mobiles illustrate this. A couple of decades ago several of these facilities would have been dismissed as science fiction. Today, more than a few of them appear to be basic trivialities, if noticed at all. Consequently, *AI is what comes next*, and this is sometimes fertile soil for speculations.

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What is AI?

- **AI is an open, multifaceted field of research**

- **AI is depending on the amalgamation and development of methods**

- **AI is a diverse phenomenon, generating myriads of applications**

- **AI is what comes next**

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What is Law? (1)

Laws regulate societies and should exhibit certain qualities. They should be **precise** and **clear**, and, in order to uphold the rule of law, **predictable**. They must also be generated in accordance to well-defined constitutional processes.

The preconditions that laws should be precise, clear and predictable make it problematic to understand how a **diversified**, **vague** and **dynamic** phenomenon like AI should be regulated.

It appears unlikely that AI should be possible to squeeze into conceptions in traditional laws, it is likewise difficult to envision a specific legal sub-section for AI – at least from the outset. Not surprisingly, the kaleidoscopic nature of AI, ostensibly being a new marvel, and the apparent lack of corresponding regulations have generated confusion.

If no legal rules are available – must AI be regulated in new, alternative and/or complementary ways?

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What is Law? (2)

On the other hand, the law is a significantly dynamic phenomenon – it reflects the needs and abilities of a society at a given point of time. Laws and the huge diversity of legal instruments are not something that has an inherent value of its own. Generally speaking and at a functional level, laws are means for achieving societal goals and managing problems. From this also follows that almost everything has a legal side, and AI is no exception.

Nor is the fact that AI is an evolving technology something that prevents a legal analysis. On the contrary, looking back at the history of law, it becomes obvious that AI does not differ from other fields of activities reflecting a high pace of change. **A large number of relevant regulations already exist**, and although AI may call for amendments and new type of rules - a legal examination must start with a gap analysis.

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What is Law? (3)

Consequently, despite the complexity and the varying interpretations of AI. From a legal point of view, it is undoubtedly so that AI stand out as *a field of research*, utilizing sets of *methods*, manifesting itself in various types of *applications*.

From this in turn follow three imperative starting points.

A legal examination of AI cannot overlook the existence of established legal doctrines concerning

- *research and development* (R&D)
- **acceptable** *methods* and
- **technical** *applications*

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Regulation of AI research - Examples (1)

- Results of R&D can be protected by patents and intellectual property rights. Researchers can therefore legally protect their work, but must also investigate whether there exist limitations concerning the use of components intended to be utilised. Also legislation about trade secrets, unfair competition and secrecy must be observed.

- Extensive regulations exist on how to reach and validate results. It is not permitted to fabricate, forge, or steal scientific data or results and there exist strict rules against plagiarism. Some of this is primarily governed by soft law - peer review, publication standards, and demands for openness illustrate, but in the background criminal law prohibits manipulation, fraud, theft, etc.

- A formal competence is important for medical researchers, but regulative demands can also relate to licensing, and frequently rules stipulate use of specified or standardised equipment as well as adherence to testing routines.

Regulation of AI research - Examples (2)

- AI Research is to a large extent financed by national and international authorities and funding organizations. The distribution of money is by default regulated in detailed ways. Rules exist about prescribed competences of organisations that can be qualified as beneficiaries, design of projects and how results should be documented, published and distributed. In academia, as in many other settings, employment structures reflecting demands for formal qualifications for researchers are defined in law.

- Stakeholders involved in R&D projects must decide about their internal relationships, how to allocate responsibilities, financial consequences, deal with conflicts, etc. Contracting is important, but in the background there is legislation that must be adhered to.

- When it comes to regulations, AI-projects do not differ a lot as compared to other kinds of research. The uniqueness of AI research is that it has the potential to reach out to almost every sector of society, and with that comes a frequent need to coordinate and adjust research activities to different regulative frameworks.

Regulation of methods (1)

- GDPR: Persons that can be identified via personal data, must give an explicit and informed consent to take part in research projects. There also exist mandatory rules on how research data may be processed and preserved as well as rues abut control, documentation and security. Violation of such rules may result in substantial fines.

- Demands for transparency: Decisions must be motivated and underlying reasons must be explicit, available for inspection. This is mandatory when humans are affected and rules out the possibilities to use prognosticating methods. Self-learning, "machine learning", computer algorithms may collect and classify persona data, which eventually may lead to that people with different backgrounds are treated differently.

- If groups or individuals do not get access to the same resources or information and/or are exposed to more extensive control or other inequal treatments, then discrimination.

Regulation of methods (2)

- Rules on how research can be conducted are in some parts of a very detailed nature, e.g. on how research involving humans and animals can be conducted. Likewise a large number of security provisions have to be met in experimental research activities.

- Studies involving humans or in other ways are sensitive must undergo mandatory (legally enacted) ethical tests before they are initiated and the need to apply for a permit to conduct research is present in several situations.

Regulation of applications

- Regulations that may be affected by AI applications are close to countless and their adaption to a new technology is a continuous process. The necessary changes may be of a general kind as well as of a detailed nature, depending on the nature of the application. Many established regulations can be operative in the future with only a few amendments. In other areas the changes may have to be more intrusive and in still other cases new legislation need to be introduced.

- It is not possible to present a list of rules that need to be revised. Some recurring general problems related to the introduction of AI are nevertheless possible to identify.

Problems - liability

- The legal system is founded on the principle that each one is accountable for his or her actions. Most explicitly this is visible in the context of criminal law, but accountability constructions abound. Everyone has a responsibility to observe preconditions in various situations, e.g. as a taxable person, employer, employee, consumer, business operator, tenant, real estate owner, student or official.

- AI may however lead to that acts and initiatives are initiated without human intervention. There is therefore a recurring need to define agents (individuals, system owners, developers, producers, public agencies, or organisations) that can be liable for mistakes and errors generated by AI on formal grounds, i.e. disregarding whether they are physically involved or not.

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Problems - liability continued

- Upcoming accountability issues are not unsolvable. The legal system has a long tradition of allocating legal responsibility to individuals and organisations. There are laws on product liability etc. What is new is that established liability structures need to be revised.

- For example, the responsibility that traditionally lies on the driver of a car must be reallocated if the vehicle is autonomous. Assuming that errors and accidents still are likely to occur, alternatives may be sought among the producers of the vehicles, the programmers, the owners of the vehicles or any organisation providing infrastructure, e.g. the road traffic agency, companies providing telecommunication or sensors of various kinds.

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Problems – transparency - lack of control

- AI systems may lack transparency – due to high level of complexity, "black boxes" or inadequate documentation. A consequence of this is that the technology becomes difficult to adjust, as updates and adjustments become complicated. Large systems may also establish *de facto standards*, without any involvement of elected assemblies or external actors. Electronic payment systems that are impossible to adjust for national legislatures is one example.

- A long-term consequence of this is that democracy eventually and step-by-step becomes replaced by technocracy – those who manage the technique and have access to the data are in control, as those who manage the algorithms at big tech companies. There is a need for revised legislation hindering the development of monopolies and rules ensuring that system become documented and constructed in an appropriate way, ensuring neutral and acceptable functionality. Related to this are also the need to implement means safeguarding data quality and traceability.

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Problems - fundamental legal principles

- "Fundamental legal principles" are rules that always are valid, but not necessary explicitly mentioned in all laws affected.

- An example is the principle of freedom of information, in the Nordic context meaning that anyone should be able to take part of documents within public agencies. Freedom of expression, privacy, rule of law, equality, etc. are generic principles of a similar kind.

- To develop AI systems so that these principles in all situations are vindicated and preserved is essential but complicated. Merging of law and AI presupposes close cooperation between experts with different backgrounds, and, at present, this is to a large extent an overlooked aspect of the development. GDPR is an early illustration but there is a need for similar regulations and standardisations of various kinds.

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Regulative problems – Manipulation

There are risks for manipulations. Resourceful actors can adjust their systems and/or introduce mechanisms disturbing many kinds of processes, let it be political elections, news reporting etc.

Regulative problems – Vulnerability

IT systems are known to malfunction and AI increases societal vulnerability. Large volumes of erroneous decisions, loss or uncontrolled spreading of sensitive data, lack of alternative backup mechanisms and technological dependence are concrete risks.

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What are the tools?

Law type	Known as…	Stable	Dynamic	General/ transparent	Detailed
1.0	Traditional written law (*lex scripta*)	X		X	
2.0	Soft Law (*Regulations & standards*)		X	X	
3.0	Embedded rules (*code*)	X			X
4.0	Autonomous regulations?	X	X	X	X

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