Liability for a conduct of Artificial Intelligence

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Artificial Intelligence / Autonomous Machines

TERMINOLOGY

BASIC INFORMATION ON FUNCTION OF AI

EXAMPLES

Characteristics of an AI driven machine

Perception of the environment

Differentiation of objects, events and situations

Assesment of relations among them

Creation of internal models of the environment

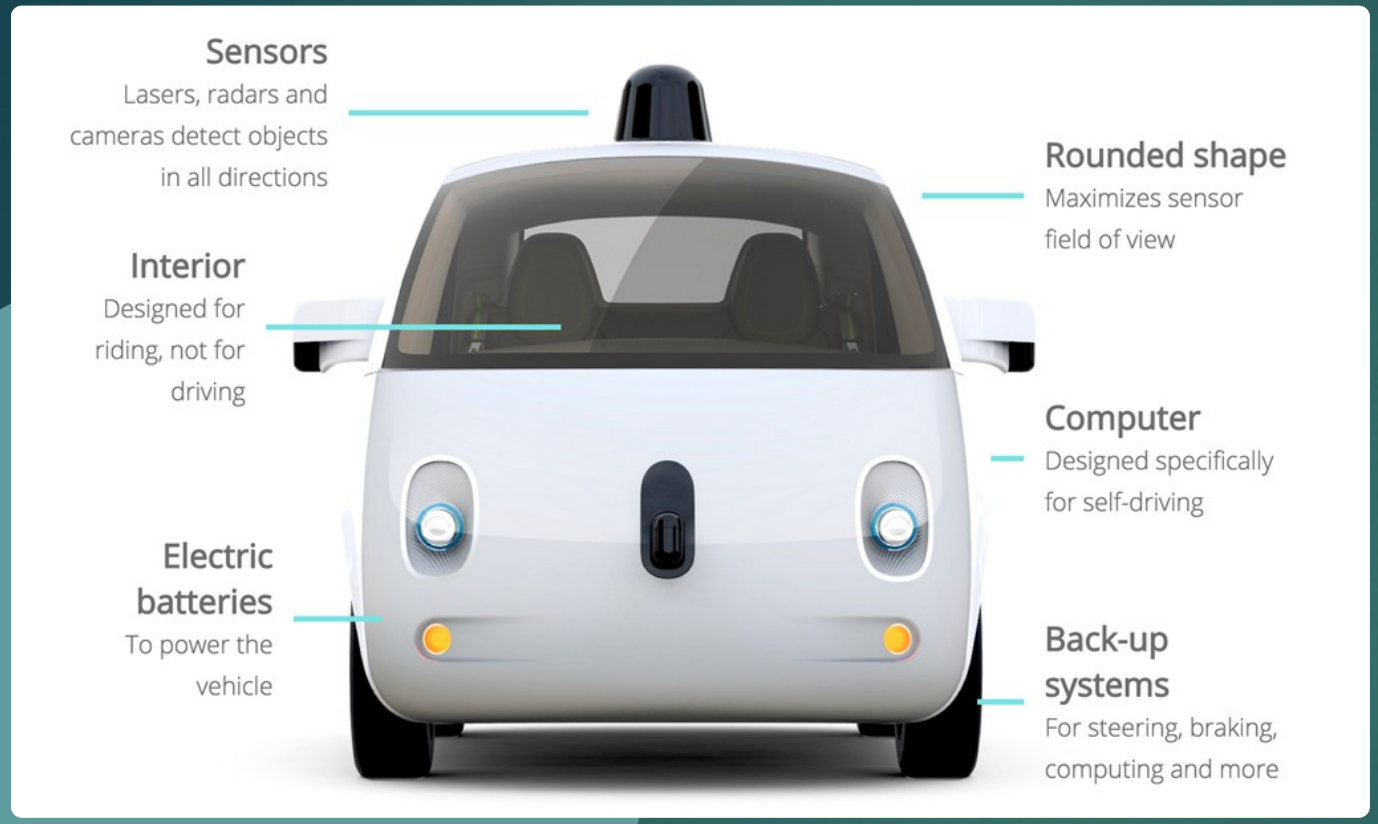
Adoption of decisions

Perception of consequences of those decisions

Autonomous Agent

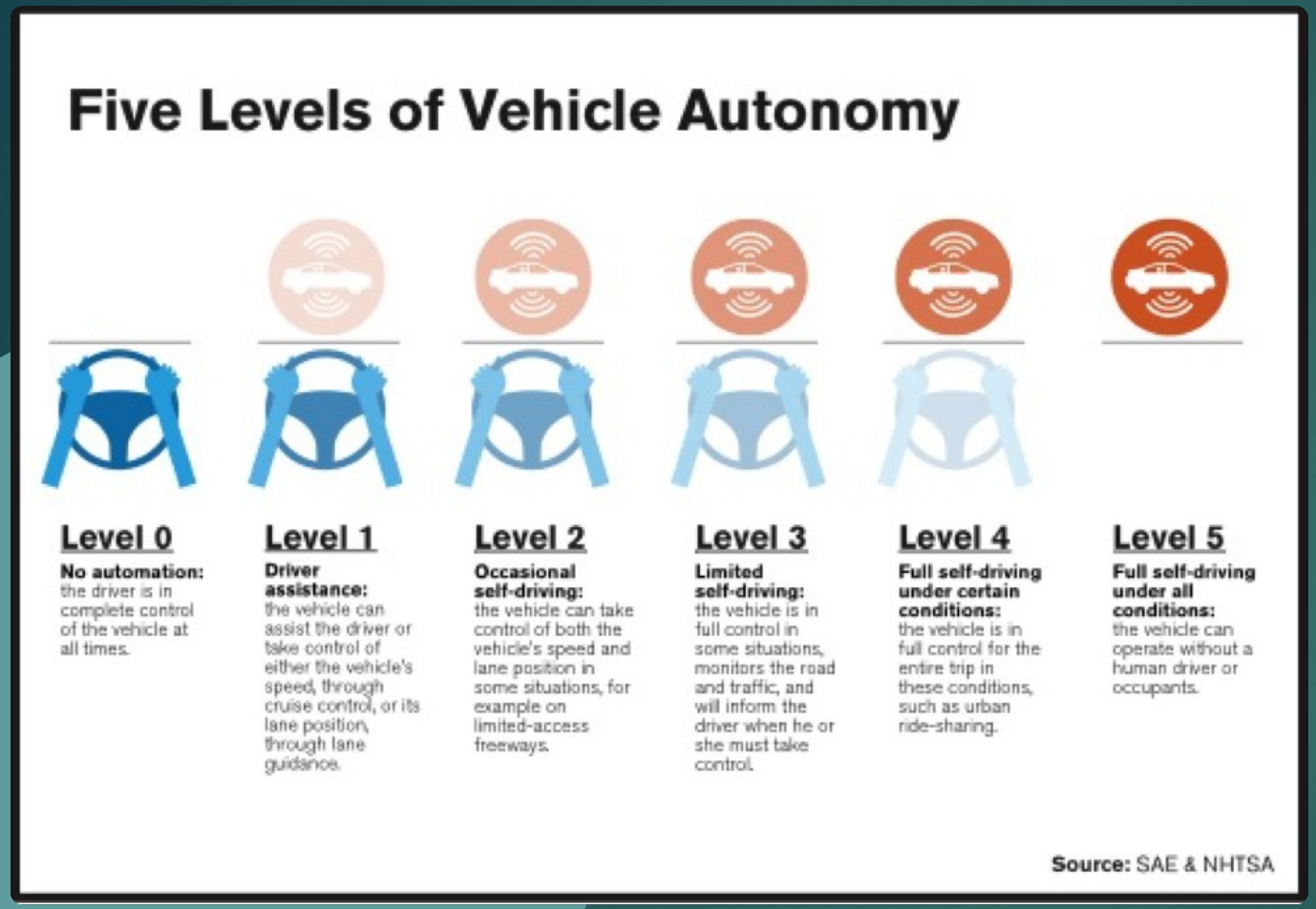
- **Autonomous behaviour** – AI is further capable of gathering information through its own sensors or by data exchange and of making independent decisions based on that information, all without further human input
- **Autonomous agent** - a software entity (goal-oriented) capable of executing actions in its environment: virtual, physical
- Examples of autonomous agents: autonomous intelligent cars (AIC), drones/unmanned aircraft vehicles (UAV), satellites
- Sources of information: sensors, cameras, data connection, lasers

Autonomous / Driverless Vehicles



General Classification of Autonomous Agents I.

- Is the classification used for AIC applicable for other autonomous agents?
- Different level of:
  - connectivity (interaction, user input)
  - mobility (virtual x physical, means of movement)
  - intelligence (programming, machine learning)
- Variability in data input
  - sensors
  - data exchange
  - products



Level of Automation/Autonomy in Autonomous Intelligent Cars

General Classification of Autonomous Agents II.

- Failure of AIC on one level of autonomy will not be the same as the failure of another AIC on the same level
- Level of autonomy as a useful concept for classification but not for liability distribution
- UAVs, planes, ships – similar autonomy level concepts (applicable), yet different purpose, users
- Possible to compare liability concepts according to certain features used in autonomous agents

Overview of Legal Materials & Preparation Works

EUROPEAN UNION

COUNCIL OF EUROPE

CZECH REPUBLIC

European Union

10. 5. 2017 – *Single Digital Market – development of AI*

21. 7. 2017 – *Report with Recommendations to the Commission on Civil Law Rules on Robotics* – law, ethics

10. 4. 2018 – *Declaration of Cooperation on Artificial Intelligence*

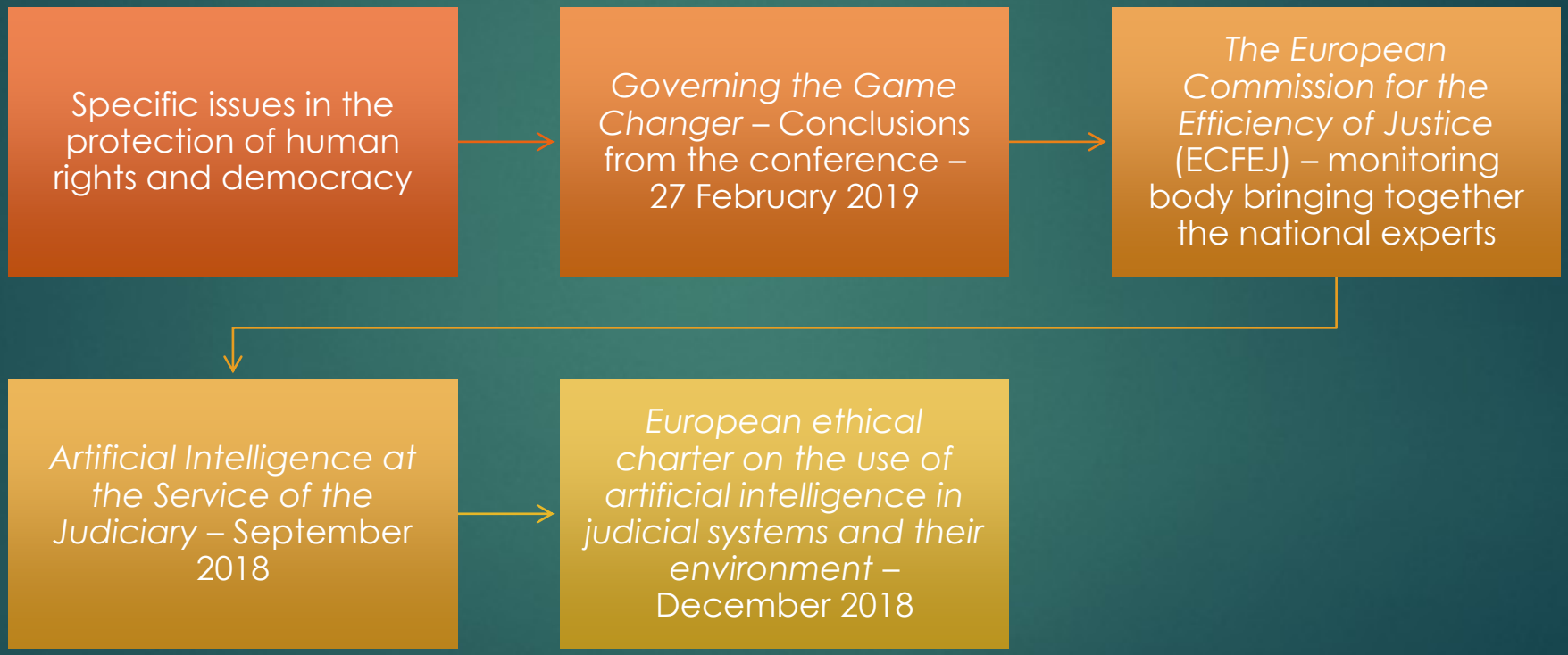
25. 4. 2018 – *Artificial Intelligence for Europe* – common european approach

7. 12. 2018 – *Coordinated plan for artificial intelligence* – part *Ethics by design and the regulatory framework*

8. 4. 2019 – *Draft of the Ethics Guidelines for Trustworthy AI*

AI H-LEG (High-Level Expert Group)

Council of Europe



Czech Republic

The Czech Republic is one of the signatories of the *Declaration on Cooperation on Artificial Intelligence*

December 2018 - *Analysis of the Development Potential of Artificial Intelligence in the Czech Republic* – 3rd part on legal and ethical aspects

National Strategy of Artificial Intelligence which builds on the recommendations in the study and the EU-wide *Coordinated Plan for Artificial Intelligence*

Platforms – academical, industrial, focus on autonomous vehicles

LIABILITY AS THE KEY ISSUE

WHY IS LIABILITY AN ISSUE IN AI

WHAT ARE THE POSSIBLE SOLUTIONS

LIABILITY CONCEPTS

Liability as the Key Legal Issue in AI

- Actions are carried out by the machine independently (liability for damages)
- Software x physical components (preventive liability)
- Software service – level x Driving school for humans
- Changes in the code, unpredictability

Liability for Emerging Digital Technologies

- Commission Staff Working Document - **Liability for emerging digital technologies**
  - Accompanying the document **Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - Artificial intelligence for Europe**
  - Issued on 25th of April 2018

- https://ec.europa.eu/digital-single-market/en/news/european-commission-staff-working-document-liability-emerging-digital-technologies

Liability Principles

- Liability - **responsibility of one party for harm or damage caused to another party, may be a cause for compensation, financially or otherwise, by the former to the latter**
- Civil law x Administrative law x Criminal law
- Contractual x Extracontractual
- Fault-based (subjective) x Strict-based (objective)

Principles of European Tort Law

- Non – harmonized accross EU
- The European Group on Tort Law - a group of scholars in the area of tort law
- Principles of European Tort Law (PETL) similar to the Principles of European Contract Law: http://civil.udg.edu/php/biblioteca/items/283/PETL.pdf
- Attribution to a concrete person (PETL):
  - Whose conduct have caused the damage
  - Whose abnormally dangerous activity has caused the damage
  - Whose auxiliary has caused the damage within the scopes of its functions

Liability Principles in Civil Law

- 1) Illegal action (tort)
- 2) Damage
- 3) Causal Nexus
- 4) Fault (intent, negligence)

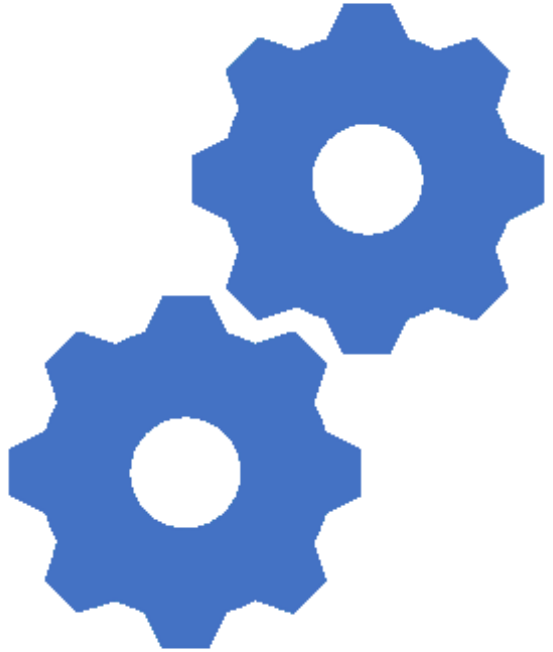
- In strict – based liability fault is not one of the conditions – **causal nexus** – the element present in every liability principle
- Causal nexus – causa / conditio sine qua non / but – for principle – **would the negative effect appear without the conduct of the defendant?**

Causal nexus for the conduct of AI

- Lower ability to control an autonomous machine – does not follow the will of the driver, decision making is not fully predictable (even by the programmer) as the machine learns itself while in function
- Inherent level of uncertainty in software „The long-term operation of complex systems entails a fundamental uncertainty, especially in the context of complex environments, including new or unpredictable environments“

Causal nexus for the conduct of distributed AI

- In complex processing environment, it is not possible to simply impose liability on any identifiable unit – multiple units means: multiple programmers, vast number of users, unpredictable number of interactions between the machines on number or platforms, operating systems, data exchanges, telecommunications programmes



Different Approaches to Causation

- Full liability x Proportional liability
- Multicausual damage:
  - Alternative causes
  - Concurrent causes
  - Cumulative causes
- Three types of approaches towards causation in Europe
  - Overarching
  - Bounded
  - Pragmatic

Liability Concepts

- Options : keep, discard, amend
- No-fault/strict (product/design defect) liability
- Risk based liability
- Quick claim resolution in certain scenarios
- Legal personhood (subjectivity)

Technical Standardisation

STANDARDISATION AS A PREVENTIVE MEASURE

STANDARDS VS. LEGAL REGULATION

HOMOLOGATION

Technical Standards & Product Safety

- Part of **preventive liability** concept
- Way of ensuring **product safety**
- Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety
- Specific product safety rules: dangerous goods, vulnerability of consumers, need for compatibility
- Involvement of all parties – manufacturers, distributors, users, law-makers
- Technical standards – description of a product from a technical perspective, construction, materials and other criteria
- Homologation – when a product needs prior certification before it can be available on the market (motor and aerial vehicles)

Technical Standards

- Although normative, do not have legal nature
- Recommendation for manufacturers, best practice
- Can be binding, if referenced in law – often published as subordinate legislation
- Adopted by specialized authorities – ISO, NIST, ETSI…

- Legislation designates which products must be safe and technical standards determines how to achieve it.
- Technical standards as a necessary addendum to regulatory approach

Missing Role Model

- Technical standards in the field of avionics – are they usable for other technologies, f.e. autonomous vehicles?
- Software in autonomous vehicles has different challenges
  - Pedestrian crossings, objects in the road, other vehicles
  - Changing traffic conditions
  - „Piloted“ by a citizen, consumer, not by a professional
  - Multitude of sensors – radar, lidar, camera
- Technical standards for autonomous trains – similar problems

Testing / Homologation Methods

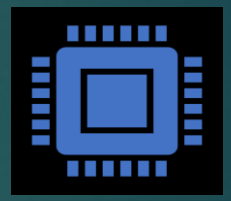
Real – life testing

Report with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL))

Good for testing standard behaviour, but subjective, possibly biased (OICA)

Black – box testing

Only the desirability of the output is assessed



Hardware-in-loop

Real-time testing, capability of the controller is tested by virtual stimuli coming from a computer integrated in the simulation environment

Research on how to adapt it for AI

Possible Solutions

- Preventive measures – testing, standardisation, homologation
- Mandatory insurance (common insurance – predictability of risks)
- Explainable AI
- Reallocation of the burden from the victim towards the person with most information
- Proximal causation - Harmonisation of criteria (at least doctrinally) for proving of causal nexus across EU
- Compensation fund/ liability fund

How to Regulate AI

UNANSWERED QUESTIONS

METHODOLOGY

New Technologies & the Law

- Challenges of new technologies
  - Multidisciplinary approach is needed to comprehend how the technology works
  - Multidisciplinary approach is to be taken also in the field of law itself
  - Rapid development, unpredictability
  - Solutions?
  - Concentration on the **content** and the **purpose** of legal regulation
  - The use of **analogy** is needed
  - It is impossible to regulate the current phenomena as well as the future ones

Artificial Intelligence as the New Legal Challenge

Is new regulation for AI needed?

When is it possible to use analogy?

Is it just another „new technology“ or are there differences?

Is it possible to regulate AI as such or should sectorial approach be taken?

Which measures are more suitable for regulating AI?

Questions?

The Oatmeal

Thank you for your attention!

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