# European law, (big) data, and artificial intelligence applications seminar (DROI1357-1)

## Subjects and Questions

### 2020-2021

# I. Self-Driving Cars

Tutors responsible for this theme: Benjamin Jan (Benjamin.Jan@uliege.be) and Jerome De Cooman (Jerome.DeCooman@uliege.be).

It seems to be clear today that the future of mobility will involve autonomous or self-driving cars. Autonomous vehicles are touted as safer and greener. On the other hand, however, as autonomous systems are introduced in our society, new risks for safety arise. They also bring the long-standing trolley dilemma up to date.

Students who will choose this theme will have to ***identify legal and ethical issues raised by autonomous vehicles.*** They are also required to ***find and explain the technical tools available*** for making self-driving cars safe. They should pay special attention to key requirements written by the Expert Group on liability and New Technologies and the AI High-Level Experts Group, especially "technical robustness and safety" and "societal and environmental wellbeing." The European Commission's White Paper on Artificial Intelligence (COM(2020) 65 final) should be part of the analysis. The following non-exhaustive list of questions should help students in their work:

1. Technical aspects:

    a. What are the main features needed for self-driving cars?
    b. Is a flaw in the object recognition system of an autonomous car a plausible risk?
    c. Is there a risk of hacking? By whom, how, and for what? Can you (i) consider different cases of hijacking autonomous vehicles and (ii) explain their harmful consequences?
    d. For autonomous vehicles to work, road networks and new infrastructures are required. Explain why and how it works.
    e. How many kilometers are needed to demonstrate autonomous vehicles are reliable in terms of fatalities and injuries? In this regard, are test-driving sufficient to demonstrate safety and reliability?

2. Legal aspects:

    a. What are the ethical issues raised by autonomous vehicles?
    b. What is the existing legal framework for traffic liability? Describe the EU product safety regulation and the EU product liability provisions that may apply to autonomous vehicles.
    c. Is the Product Liability Directive adequate regarding autonomous vehicles? Should ad-hoc EU legislations be adopted?
    d. In cases of hacking and other cybercrimes of autonomous vehicles, what says the GDPR about civil liability of producers?

3. Interdisciplinary questions:

What kind of liability regime seems the most adequate in your view regarding innovation? What is the impact on liability of the AI systems does not meet the transparency requirement? How is it possible to

manage liability? What is the impact on liability if the transparency requirement is not met by the AI system? How is liability impacted if it is impossible to trace back decisions taken by the AI system? How is it possible to manage risk safety and liability without stifling innovation?

As stated above, this list is not exhaustive. It only aims to help students structure their written report and online presentation. They are free – and even encouraged – to identify and answer other relevant questions. Furthermore, students from Law and Applied Science Faculties should collaborate to present altogether technical and legal issues, as well as their solutions.

# II. Privacy in Household Robots

Tutor responsible for this theme: Jerome De Cooman (Jerome.DeCooman@uliege.be).

The market of household robots – *aka* in house, home, domestic, personal, or service robots – is increasingly expending. Popular WowWee Rovio, vacuum cleaner Roomba, Erector Spykee, and Anky Vector are good examples. But as they are introduced in houses, legal issues arise. Household robots are, by definition, equipped to collect data and process them to act in the world. This imply they have a large array of sensors, allowing them to operate but also to record personal data.

Data collection seems to be necessary for the robot to properly function, but it also gives rise to privacy concern which, if left unsolved, can weaken consumers' trust in market. Students who will choose this theme will ***identify all relevant legal, ethical, and technical issues, as well as their solutions***. More precisely, they will have to ***identify trade-offs between privacy, efficiency, and trust***. They should pay special attention to key requirements written by the European Commission's High-Level Experts Group, especially "privacy and data governance" and "technical robustness and safety." The following non-exhaustive list of questions should help students in their work:

1. Technical aspects:

    a. What are the main features and components of household robots?
    b. Why and how do household robots collect data?
    c. What data is likely to be collected?
    d. Is data backup up and stored? If so, where, how, and how long?
    e. Is there a risk of hacking? By whom, how, and for what? Can you (i) consider different cases of hijacking household robots and (ii) explain their harmful consequences?

2. Legal aspects:

    a. What are the legal issues raised by household robots?
    b. What are the fundamental rights at stake?
    c. What are the current relevant legal instruments framing household robots?
    d. How is data collection organized in EU law? Does the current framework fits challenges raised by household robots?
    e. What should be done in case of hacking?

3. Interdisciplinary questions:

Could you envision trade-offs between use and protection of data? Could privacy-by-design and security-by-design be envisioned as workable solutions to protect users against hijacking of household robots? How is it possible to manage liability? What is the impact on liability if the transparency requirement is not met by the AI system?

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# III. Automated decision-making in the public sector

Tutor responsible for this theme: Benjamin Jan (Benjamin.Jan@uliege.be).

Automated decision-making is already being used by administrations to provide new services or improve existing ones. Although AI systems can contribute to making administration decisions more efficient, automated decision-making challenges the foundations of (EU) administrative law.

Under this theme, students are required to ***identify legal and ethical issues*** **raised by automated decision-making in the public sector**, especially regarding transparency, explainability and accountability. They are also required to ***find and explain the technical tools available*** for making compliant automated decision-making systems' use by the public sector with administrative law. Students must pay particular attention to key requirements written by the European Commission's High-Level Experts Group on AI. The following non-exhaustive list of questions should help students in their work:

1. Technical aspects:

    a. What means in technical terms the 'black-box' nature of machine learning algorithms?
    b. What models can lead to transparent decision-making processes?
    c. What are the most relevant auditing techniques? Is it possible to not open the black-box and still allow an examination of the AI system?
    d. How can we embed transparency-by-design algorithms?
    e. Are there trade-off effects of auditing techniques/transparency requirements? If so, what is the impact on algorithms' accuracy?

2. Legal aspects:

    a. Identify the relevant provisions regarding EU administrative procedural law in the TFEU and the European Charter of Fundamental Rights.
    b. At the EU level, what are the relevant provisions relating to automated decision-making in the public sector? Next to the GDPR, are there EU specific legislation (e.g. in the area of police and justice)?
    c. What rights enjoy individuals when a decision concerning them is automated? Are they absolute rights?
    d. How transparency, explainability and accountability are interrelated?

3. Interdisciplinary questions:

There is a profound collision between administrative law requirement of transparency and reason-giving and the fact that many algorithms used in automated decisions are not, by their structure, fully explainable. In your opinion, how much transparency within AI systems is needed to comply with administrative law? If full disclosure of the code is required, what are the potential trade-off effects both from a legal and technical perspective? In your view, what is the best balance to find between transparency and accuracy?

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# IV. Algorithmic Non-discrimination

Tutor responsible for this theme: Benjamin Jan (Benjamin.Jan@uliege.be).

Decisions and processes concerning everyday life are increasingly automated, based on data. When algorithms are used for decision making, there is potential for discrimination against individuals. Algorithmic decision making can indeed be used to create new inequalities, or to amplify and hide discrimination. Algorithmic decision making can also make discriminatory or unfair practices more traceable and combat them.

Under this theme, students are required to ***identify legal and ethical issues*** **raised by automated decision-making algorithms** from a **non-discriminatory perspective**. They are also required to ***find and explain the technical tools available*** to avoid or combat discriminatory bias. Students must pay particular attention to key requirements written by the European Commission's High-Level Experts Group. The following non-exhaustive list of questions should help students in their work:

1. Technical aspects:

    a. How can we avoid biased training data?
    b. What are the technical tools available to avoid creating or reinforcing discriminatory bias?
    c. How to ensure that the AI system's entire life cycle meets AI ethics regarding non-discrimination? Is non-discrimatory algorithms by-design possible?
    d. Are discrimination-aware algorithms a solution?
    e. Can we 'repair' discriminatory algorithms?

2. Legal aspects:

    a. At the EU level, what are the relevant provisions relating to automated-decision making and the principle of non-discrimination?
    b. What means 'sensitive data' from an EU law perspective? How should it be processed?
    c. What rights enjoy individuals when a decision concerning them is automated?
    d. Who are the relevant stakeholders for the implementation and the enforcement of the provisions from (c)?

3. Interdisciplinary questions:

Non-discrimination laws and data protection law leave gaps in the context of AI. Beyond existing criteria of well-identified social groups in these laws, automated-decision might discriminate new groups of individuals (e.g. regarding their financial situations). Should additional regulations be considered? If so, which sectors should be prioritized?

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# V. Copyrightability of Artificially-Generated Works of Art

Tutor responsible for this theme: Jerome De Cooman (Jerome.DeCooman@uliege.be).

Are robots or artificial intelligence systems able to create works of art? This question, quite controversial, is no more science fiction. Taking a look at "The Next Rembrandt" – or reading the betrayal story written by the storytelling machine Brutus – is enough to be convinced. If they are able to produce art, the next question is whether or not their works are copyrightable. Unsurprisingly, intellectual property scholars discuss this question for years. This is still unsolved.

Students who will choose this theme will have ***to present and respond to arguments in favour and against the copyrightability of artificially-generated works of art***, and conclude whether or not they are copyrightable. To do so, they will identify relevant legal issues and their solutions. The following non-exhaustive list of questions should help students in their work:

1. Technical aspects:

    a. Can AI systems create something new, as they works will be based on data?
        i. Explain how these technologies works. What are their main features and components?
        ii. Why, and how, is data collected?
    b. Can an AI system create something original? For this particular question, be sure to collaborate with students with a legal background.
    c. Do computers have a minimum degree of creativity?

2. Legal aspects:

    a. Does the 1886 Berne Convention for the Protection of Literary and Artistic Works protects, even indirectly, artificially-generated works of art?
    b. To be copyrighted, a work must be original and expressed.
        i. What is required under the condition of originality?
        ii. What is required under the condition of expression?
    c. Does intellectual property laws require human authorship?

3. Interdisciplinary questions:

Are artificially-generated works of art copyrightable? Should artificially-generated works of art be copyrightable? Who is the true author? The machine or the human beyond the machine? Who should own the copyright?

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