Law, AI and robotics: UK

[WP4 – AI and robotics]

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Abstract

The objective of this report is to review the state of the law and current legal responses to developments in artificial intelligence (AI) and robotics and determine how specific questions or issues are addressed in the UK. It highlights key legal developments pertaining to AI and robotics covering the last five to ten years. It looks at developments in AI and/or robotics legislation that may influence constitutional or human rights, and attempts or plans to create or adapt legislation to AI and robotics developments. The role of regulation, case law and creation of new regulatory bodies is examined with regard to how AI and robotics applications are designed, set up, commissioned or used, among others. It explores how law and AI interact with regard to two issues: (i) algorithmic bias and discrimination (including automated decision-making systems), and (ii) intellectual property issues related to works created by AI. For robotics, it explores two issues (i) creation of a specific legal status for robots and (ii) safety and civil liability issues: who is liable for damage caused by robots. A brief analysis of gaps and challenges follows.

Document history

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Linked task	Points of relevance
Task 4.2	This report is part of and, provides input to deliverable 4.2.

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Executive summary

This report reviews the state of the law and current legal responses to developments in AI and robotics and determines how specific issues are addressed in the UK.

There are some significant Parliamentary and regulatory agency reports that have focused (to varying degrees) on legal issues related to AI and robotics in the UK. Legal academic discourses have focussed on the legal, social and technological regulatory aspects of autonomous vehicle use, AI, big data and intellectual property, and the various opportunities and challenges presented to the law.

There is no AI and robotics-specific legislation in the UK; existing laws and regulations (e.g., consumer laws, data protection laws, intellectual property law, tort law) may cover these technologies, including any harms resulting from them.

Developments in AI and robotics have fostered parliamentary discussions and legal debate, but there has not yet been specific movement in the UK to amend human rights legislation in response to such developments. The General Data Protection Regulation (GDPR) and the Data Protection Act 2018 (DPA 2018) provide a comprehensive legal framework for data protection in the UK. Another significant recent development is the Automated and Electric Vehicles Act 2018 which regulates automated and electric vehicles.

AI-specific legislation is unlikely to be developed in the short term in the UK. The overall position is that AI-specific regulation, at this stage, would be inappropriate and a sector-specific, an agile approach seems preferred.

Two new bodies being considered (as of writing) include a 'Council of Data Ethics' to address legal and ethical challenges associated with balancing privacy, anonymisation, security and public benefit and a Centre for Data Ethics & Innovation to review the current governance landscape and advise the Government on the ethical, safe and innovative uses of data, including AI.

The report also covers how specific legal issues pertaining to AI and robotics are addressed.

Algorithmic bias and discrimination might violate the provisions of the Equality Act 2010 and the Human Rights Act 1998 if it affects the enjoyment of one or more rights guaranteed. The GDPR and DPA 2018 could support claimants in understanding discriminatory data sets to bring claims of discrimination.

With regard to **intellectual property issues** related to works created by AI, UK law protects computer-generated literary, dramatic, musical or artistic works. There is no express legal provision on patentability of computer-generated works in the UK. As a registered trade mark is personal property, unless an AI system was able to hold/have personal property, this right might not apply or be able to be enjoyed by the AI system.

Robots do not have a specific legal status in the UK. Some commentators highlight how UK courts have taken a pragmatic approach to the development and use of corporate personalities and that this flexibility could readily accommodate technological advances in AI or autonomous systems. Experts also suggest that legal personhood for purely synthetic entities might become a legal possibility, but would be morally unnecessary and legally troublesome.

There is much legal commentary on **robot safety and liability issues**, though sometimes these areas are seen as "legally grey" particularly in relation to ascribing liability.

There has been increased attention to police decision algorithms and calls for their regulation, even though the use of these is not yet widespread.

Legal experts suggest that there is no obvious reason why the growth of AI and the use of data in the UK would require further or widespread legislation or regulation (given the infancy of AI), but there have also been calls to prevent algorithm-perpetuated bias and injustice.

Engagement from the human rights perspective is still lacking, though some issues (e.g., discrimination, privacy infringements) have been, and are being addressed. We think that the discussion in the UK needs to move beyond its privacy and data protection-centricity towards addressing other highly-impacted human rights such as the right to life, liberty and security of the person, freedom of thought and conscience.

There are pros and cons of both strong and light-touch regulation (the latter of which has been advocated for the UK). We recommend a cautious approach to avoid the adverse effects of hasty and ill-considered regulation.

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List of acronyms/abbreviations

Abbreviation	Explanation
AI	Artificial intelligence
BAILII	British and Irish Legal Information Institute
CDPA	Copyright, Designs and Patents Act
D	Deliverable
DPA	Data Protection Act
ECHR	European Convention on Human Rights
EU	European Union
GDPR	General Data Protection Regulation
ICO	Information Commissioner's Office
NHS	National Health Service
RUSI	Royal United Services Institute
UK	United Kingdom of Great Britain and Northern Ireland
WP	Work package

Table 1: List of acronyms/abbreviations

Glossary of terms

Term	Explanation
Artificial intelligence	The science and engineering of machines with capabilities that are considered intelligent (i.e., intelligent by the standard of *human* intelligence). Major applications of AI technology are in transportation, education, finance, industry, healthcare, marketing, management, telecommunications, entertainment and defence, amongst other fields. Important subfields of AI were found to include: knowledge representation and automated reasoning, artificial neural networks, machine learning, computer vision, computer audition, natural language processing, expert systems, data mining, intelligent agent systems and automated planning, evolutionary computation. [SIENNA D4.1]
Robotics	The field of science and engineering that deals with the design, construction, operation, and application of robots. Major applications of robots are in transportation, industry, healthcare, education, entertainment, space exploration, defence, retail, companionship, housekeeping and other areas. Important subfields of robotics were found to include: robot mechanics, robot sensing, robot control (including many subareas, such as robot learning, adaptive control, developmental robotics, evolutionary robotics, cognitive robotics, behaviour-based robotics, robotic mapping and planning), robot locomotion, bio-inspired and soft robotics, humanoid robotics, microrobotics, nanorobotics, beam robotics, cloud robotics, swarm robotics, telerobotics, social robotics and human-robot interaction.

Term	Explanation
	[SIENNA D4.1]
Automated decision-making	Decision based solely on automated processing, including profiling, which produces legal effects concerning a data subject or similarly significantly affects him or her (GDPR, Article 22 (1). It refers to individual decision-making made by automated means without any human involvement. Examples include: an online decision to award a loan; and a recruitment aptitude test which uses pre-programmed algorithms and criteria.[1] (Information Commissioner's Office)
Machine learning	A set of approaches within AI where statistical techniques and data are used to "teach" computer systems how to perform particular tasks, without these systems being explicitly programmed to do so. (SIENNA D4.1, p. 11.)

Table 2: Glossary of terms

[1] Information Commissioner's Office, "Rights related to automated decision making including profiling". https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/individual-rights/rights-related-to-automated-decision-making-including-profiling/

1. Introduction

The United Kingdom of Great Britain and Northern Ireland (UK) is made up of four countries, i.e., England, Wales, Scotland and Northern Ireland. Some law in the UK is applicable throughout, other laws are more country-specific. There are three legal systems in operation – one each for England and Wales (common law legal system), Scotland and Northern Ireland.[2] The main sources of law are: acts of parliament, case law (common law is an important source of key legal principles, particularly in relation to the preservation of the rights of the individual against the state and the rule of law) and European Union law.[3] The UK is subject to international legal obligations and is a signatory to numerous international treaties and conventions, notably the European Convention on Human Rights (ECHR).

The objective of this report is to review the state of the law and current legal responses to developments in AI and robotics and determine how specific questions and issues are addressed in the UK.

The primary method used in preparing this report was desk research (using legal research and academic databases such as British and Irish Legal Information Institute (BAILII), Legislation.gov.uk; the desk research used the methods described in the SIENNA Handbook – i.e., the functional, doctrinal and law-in context methods.[4] The report only covers developments up to the date of its delivery – 6 December 2018.

Recent policy documents and legal academic discourses dealing with legal issues and regulation of AI and robotics

There are some significant reports that have focused (to varying degrees) on legal issues related to AI and robotics in the UK. These include:

- House of Lords Select Committee on Artificial Intelligence*, Report of Session 2017–19, AI in the UK: ready, willing and able?* (March 2018)
- House of Commons Science and Technology Committee*, Algorithms in decision-making Fourth Report of Session 2017–19* (15 May 2018)
- Information Commissioner's Office, *Big data, artificial intelligence, machine learning and data protection* (September 2017)
- House of Commons Science and Technology Committee*, Fifth Report of Session 2016–17, Robotics and artificial intelligence* (2016)
- Science and Technology Committee, *The big data dilemma, Fourth Report,* Session 2016-17, (2016).
- Government Office for Science, *Artificial Intelligence: opportunities and implications for the future of decision making* (November 2016)

[2] This report looks at only the general UK level. It did not explore the finer differences in the treatment of AI and robotics in each country of the UK.
[3] Rab, Suzanne, "Legal systems in UK (England and Wales)", *Practical Law.* https://uk.practicallaw.thomsonreuters.com/5-636-2498?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1#co_anchor_a279982
[4] SIENNA, *D1.1: The consortium's methodological handbook*, 30 April 2018, Section 4.

Legal academic discourses in the UK have focussed on exploring legal, social and technological regulatory aspects to autonomous vehicle use[5]; AI, big data and intellectual property[6], the various opportunities and challenges presented to the law by AI.[7] Other notable legal academic discourses[8] by UK scholars explore AI and robotics legal issues in a broader sense (wider than a UK-only scoped study).

The position in the UK is that there is no AI and robotics-specific legislation; existing laws and regulations (consumer laws, data protection laws, intellectual property law, tort law, etc) may and should cover these technologies, including any harms resulting from them.

2. Scope and limitations of the report

This report has a limited scope as demarcated by the SIENNA task 4.2 workplan. It does not comprehensively cover all aspects of the regulation of AI and robotics given that both these technologies are vast topics in themselves. They also pose a challenge as they span a range of applications and sectors), regulations and legal issues. This report focusses on a limited range of topics with high-policy and human rights significance. It also excludes from its scope the more wider legal non-jurisdiction specific discussions.

[5] Banzi, Geofrey, "The 'Morality Algorithm': Exploring the Legal, Social and Technological Regulatory Aspects to Autonomous Vehicle Use and Policy within the UK", 13 July 2017. http://dx.doi.org/10.2139/ssrn.3001804. This thesis discusses the key legal and ethical issues arising from the use of autonomous vehicles (AVs) specifically focusing upon the issue of liability within UK Law.

[6] Abbott, Ryan, "Artificial Intelligence, Big Data and Intellectual Property: Protecting Computer-Generated Works in the United Kingdom", in Tanya Aplin (ed.), *Research Handbook on Intellectual Property and Digital Technologies*, Edward Elgar Publishing Ltd, 2017/forthcoming. https://ssrn.com/abstract=3064213. This provides an up-to-date review of UK, EU and international law and argues that patentability of CGWs is a matter of first impression in the UK, but that CGWs should be eligible for patent protection as a matter of policy. It argues that the definition of CGWs should be amended to reflect the fact that a computer can be an author or inventor in a joint work with a person.

[7] Law Pod UK, "Will AI outwit our laws", 6 June 2018. Rosalind English discusses with Professor Karen Yeung of Birmingham University the various opportunities and challenges presented to the law by Artificial Intelligence. https://itunes.apple.com/us/podcast/law-pod-uk/id1259360349

[8] See, e.g., Wachter, S., B.D.M Mittelstadt,. and C. Russell, "Counterfactual Explanations Without Opening the Black Box: Automated Decisions and the GDPR", Harvard Journal of Law and Technology, 31, 2, 2018; Veale, M., R. Binns & L. Edwards, "Algorithms That Remember: Model Inversion Attacks and Data Protection Law" *Philosophical Transactions of the Royal Society,* 2018; Edwards L., & M. Veale, "Enslaving the Algorithm: From a "Right to an Explanation" to a "Right to Better Decisions"?" *IEEE Security & Privacy* 16(3), 2018, pp. 46-54; Edwards L., & M. Veale "Slave to the Algorithm? Why a 'Right to an Explanation' is Probably Not the Remedy You Are Looking For", *Duke Law & Technology Review*, 16(1), 2017, pp. 18–84; Schafer, Burkhard, Lilian Edwards, ""I spy, with my little sensor": Fair data handling practices for robots between privacy, copyright and security", *Connection science*, Vol 29, 2017, pp. 200-209; Wachter, S., B. Mittelstadt, and L. Floridi, "Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation", *International Data Privacy Law*, 7 (2), 2016, pp. 76-99; Schafer, B., D. Komuves, J.N. Zatarain, & L. Diver, "A fourth law of robotics? Copyright and the law and ethics of machine co-production", *Artificial Intelligence and Law*, vol. 23, no. 3, 2015, pp. 217-240

3. Legal developments

This section highlights key UK legal developments pertaining to AI and robotics covering the last five to ten years. The results were sourced from legislative databases, official publications, Parliamentary documents and local law firms websites.

Have developments in AI (i.e., automated decision-making systems, algorithmic systems, machine learning) and robotics led to amendments in constitutional or human rights and/or legislation bearing on constitutional or human rights?

Developments in AI and robotics have fostered parliamentary discussions and legal debate, but there has not yet been very specific movement in the UK to amend human rights legislation. As discussed in greater detail in response to the next question, one legal development that has some bearing is the revision of the national data protection law. The General Data Protection Regulation (GDPR) has direct effect in the UK along with the Data Protection Act 2018[9] (this replaces the Data Protection Act 1998 to provide a comprehensive legal framework for data protection in the UK, in accordance with the GDPR). The DPA 2018 updates the rights provided for in the 1998 Act to make them easier to exercise and to ensure they continue to be relevant with the advent of more advanced data processing methods. The four main matters provided for in the 2018 Act are general data processing, law enforcement data processing, data processing by the intelligence services and regulatory oversight and enforcement.

Have there been/are there attempts or plans to create or adopt new legislation in response to developments in AI and robotics (e.g., granting legal personhood to robots, prescribing civil or criminal liability for harms caused), or to regulate[10] how AI and robotics applications are designed, set up, commissioned or used? (e.g., regulation of algorithmic development or restrictions on the use of robots in certain conditions or sectors)

The Automated and Electric Vehicles Act 2018[11], following agreement by both Houses of Parliament, received Royal Assent on 19 July 2018 and is now an Act of law. The Act regulates automated and electric vehicles and is intended to enable consumers in the UK to benefit from improvements in transport technology. It creates a new liability scheme for insurers in relation to automated vehicles and contains regulations relating to the installation and operation of charging points and hydrogen refuelling points for electric vehicles. It sets out the regulatory framework to enable new transport technology to be invented, designed, made and used in the UK.[12] We discuss this further in section 4.2.2 of this report.

The Data Protection Act 2018[13] (which regulates the processing of information relating to individuals etc) received Royal assent on 23 May 2018 and became an Act of law. The Act does not mention

[9] 2018 c.12. http://www.legislation.gov.uk/ukpga/2018/12/contents . The Act extends to This Act extends to England and Wales, Scotland and Northern Ireland unless otherwise specified.
[10] This could be to restrict or advance the development or use of such applications.
[11] 2018 c.18. http://www.legislation.gov.uk/ukpga/2018/18/contents/enacted . Part 1 extends to England and Wales and Scotland and Part 2 extends to England and Wales, Scotland and Northern Ireland.
[12] http://www.legislation.gov.uk/ukpga/2018/18/notes/division/2/index.htm
[13] 2018 c.12. http://www.legislation.gov.uk/ukpga/2018/12/contents

"artificial intelligence" or "robotics" *per se*, but regulates "automated decision-making" and "automated processing" of personal data including the use of personal data in AI and machine learning. The Act provides a right to individuals not to be subject to automated decision-making unless that decision is required or authorised by law. It also prescribes safeguards for such automated decision-making (for example, providing information to the data subject about decisions being taken and the opportunity to respond[14]). It also outlines that 'significant decisions[15]' about individuals (those producing adverse legal effects or significantly affecting them,) cannot be taken based solely on automated processing.

The UK Government has clarified (as of June 2018) that individual businesses can decide on whether and how to inform consumers of AI's deployment. It has stated that "should a regulatory requirement be introduced, it will be done so in consultation with relevant industry bodies, businesses, regulators, and Government departments".[16] If this is achieved, it would raise transparency with relation to individual rights – if individuals are not aware that automated decision-making is being used, the exercise of their rights is frustrated.

One of the issues identified by the Artificial Intelligence Select Committee's Report, *AI in the UK: Ready, Willing and Able?* related to how under current data trust proposals, individuals had no means to make their views heard or shape decisions. In response to this, the government outlined that it is "currently exploring data sharing frameworks such as Data Trusts – mechanisms where parties have defined rights and responsibilities with respect to shared data – in order to protect sensitive data, facilitate access to data, and ensure accountability" and will "consider how best to develop governance structures that would include representation of the individuals and organisations concerned".[17]

AI-specific legislation is unlikely in the short term in the UK. The Government has unequivocally stated that it agrees with the UK House of Lords AI Committee statement that "Blanket AI-specific regulation, at this stage, would be inappropriate. We believe that existing sector-specific regulators are best placed to consider the impact on their sectors of any subsequent regulation which may be needed…".[18] It has further underlined its commitment to "develop an agile approach to regulation that promotes innovation and the growth of new sectors, while protecting citizens and the environment" and will establish "a Ministerial Working Group on Future Regulation[19] to scan the

[14] Data subjects may before the end of the period of one month beginning with receipt of the notification, request the controller to reconsider the decision, or take a new decision that is not based solely on automated processing. Section 14 (4) (b), DPA 2018.

[15] Where automated decision-making is authorised by law, a 'significant decision' is on that, in relation to a data subject, produces legal effects concerning the data subject, or similarly significantly affects the data subject. Section 14 (2). With regard to the section 49 right not to be subject to automated decision-making, a decision is a "significant decision" if, in relation to a data subject, it produces an adverse legal effect concerning the data subject, or significantly affects the data subject.

[16] HM Government, *Government response to House of Lords Artificial Intelligence Select Committee's Report on AI in the UK: Ready, Willing and Able?* Presented to Parliament by the Secretary of State for Business, Energy and Industrial Strategy by Command of Her Majesty, CM 9645, June 2018, p.7. https://www.parliament.uk/documents/lords-committees/Artificial-Intelligence/AI-Government-Response.pdf

[17] HM Government, op .cit., June 2018, p.7.

[18] HM Government, op .cit., June 2018, p.35.

[19] This group met for the first time in Oct 2018. The group, which will meet on a quarterly basis, is responsible for strengthening the Government's horizon scanning for emerging regulatory challenges arising from

horizon and identify the areas where regulation needs to adapt to support emerging technologies such as AI, supported by the Office for AI and the Centre for Data Ethics and Innovation."[20]

Are there new regulatory bodies being set up to regulate AI and robotics? What are the developments on this front? (e.g., AI watchdogs, AI commission, Robotics commission)

In its 2016 report on "The big data dilemma"[21], the House of Commons Science and Technology Committee recommended that the government should establish a 'Council of Data Ethics' to address "the growing legal and ethical challenges associated with balancing privacy, anonymisation, security and public benefit".[22]

Similarly, the UK Industrial Strategy[23] announced a new Centre for Data Ethics & Innovation slated to be the "world-first advisory body" to review the current "governance landscape" and advise the Government on "ethical, safe and innovative uses of data, including AI".[24] The House of Commons Science and Technology Committee report, *Algorithms in decision-making,* welcomed this initiative and stated that it would "occupy a critically important position, alongside the Information Commissioner's Office, in overseeing the future development of algorithms and the 'decisions' they make". The report recommended, *inter alia* that, the Centre for Data Ethics & Innovation should also engage with other like-minded organisations in other comparable jurisdictions in order to develop and share best practice and explore a variety of challenges. Among the issues to be examined are how explanations for how algorithms work can be required to be of sufficient quality to allow a reasonable person to be able to challenge the 'decision' of the algorithm and what safeguards should be considered for the right to explanation. In addition, the report suggested the Centre for Data Ethics & Innovation should, along with the Information Commissioner's Office (ICO), keep the operation of the GDPR under review as far as it governs algorithms and report to Government by May 2019 on areas where the UK's data protection legislation might need further refinement. It was also suggested that the Centre and the ICO should review the extent of algorithm oversight by each of the main sector-specific regulators, and use the results to guide those regulators to extend their work in this area as appropriate.

The UK Government clarified, "the Office for Artificial Intelligence, the future Centre for Data Ethics and Innovation and the AI Council will work together to create Data Trusts. Data Trusts will ensure that the infrastructure is in place, that data governance is implemented ethically, and in such a way

innovative products, services and business models; commissioning departments to develop regulatory reform proposals to enable innovative products, services and business models; promoting action by regulators to develop innovation-enabling regulatory approaches; seeking to resolve complex regulatory issues that cross sectoral, departmental or regulator boundaries; and Driving the exchange of best practice in innovation-enabling approaches across Whitehall. See: https://www.gov.uk/government/news/business-secretary-hosts-first-cross-government-working-group-on-future-regulation

[20] HM Government, op .cit., June 2018, p.35.

[21] House of Commons Science and Technology Committee, *The big data dilemma Fourth Report of Session 2015–16.* https://publications.parliament.uk/pa/cm201516/cmselect/cmsctech/468/468.pdf

[22] Ibid.

[23] HM Government, *Industrial Strategy*, White Paper, 2017. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

[24] Ibid.

that prioritises the safety and security of data and the public."[25] The Government has outlined clearly its intent, to make AI work for everyone's benefit through its Digital Charter.

The government launched a consultation on the Centre for Data Ethics and Innovation Consultation in June 2018.[26] The consultation ran for 12 weeks and closed on 5 September 2018; there were 104 responses from a wide range of respondents. The government responded to the consultation in November 2018.[27]

The Centre for Data Ethics and Innovation (CDEI)[28] is now in operation in the UK as a government advisory body led by an independent board of expert members to investigate and advise on how the benefits of data-enabled technologies, including artificial intelligence (AI) can be maximised.[29] It will identify measures needed to strengthen and improve the way data and AI are used; promote best practice and advise on how Government should address potential gaps in the regulatory landscape. Along with this we have the Office for AI which is based in the UK Government and is responsible for overseeing implementation of the UK's AI strategy.[30] The AI Council will promote industry-to-industry cooperation, boost the understanding of AI in the business world, and identify barriers to growth and innovation. [31]

Identify any significant case law or judgments[32] addressing human rights challenges[33] of AI and robotics (if there are no judgments, you can refer to legal doctrine)

One of the significant recent cases is the case of *Big Brother Watch and others v The United Kingdom*[34], which was initiated following revelations by Edward Snowden relating to the electronic surveillance programmes operated by the intelligence services of the USA and the UK. The case was tried before the European Court of Human Rights. The applicants, believed that due to the nature of their activities, their electronic communications were likely to have either been intercepted by the UK intelligence services, obtained by the UK intelligence services after being intercepted by foreign governments, and/or obtained by the UK authorities from Communications Service Providers ("CSPs"). Relevant fundamental rights discussed in the case were Article 7 (right to respect for private

[25] HM Government, *Government response to House of Lords Artificial Intelligence Select Committee's Report on AI in the UK: Ready, Willing and Able?* Presented to Parliament by the Secretary of State for Business, Energy and Industrial Strategy by Command of Her Majesty, CM 9645. June 2018, p.5. https://www.parliament.uk/documents/lords-committees/Artificial-Intelligence/AI-Government-Response.pdf

[26] https://www.gov.uk/government/consultations/consultation-on-the-centre-for-data-ethics-and-innovation/centre-for-data-ethics-and-innovation-consultation

[27] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757509/Centre_for_Data_Ethics_and_Innovation_-_Government_Response_to_Consultation.pdf

[28] https://www.gov.uk/government/groups/centre-for-data-ethics-and-innovation-cdei

[29] https://www.gov.uk/government/groups/centre-for-data-ethics-and-innovation-cdei

[30] https://www.gov.uk/government/news/world-leading-expert-demis-hassabis-to-advise-new-government-office-for-artificial-intelligence

[31] https://www.gov.uk/government/news/world-leading-expert-demis-hassabis-to-advise-new-government-office-for-artificial-intelligence

[32] Limited only to decisions in the highest courts .

[33] For example, discrimination, inequality, privacy infringements, unfavourable work conditions, harm to life, bodily integrity, human safety and welfare, liability etc.

[34] Applications nos. 58170/13, 62322/14 and 24960/15, European Court of Human Rights, 13 September 2018. https://hudoc.echr.coe.int/eng#{"itemid":["001-186048"]}

and family life), Article 8 (protection of personal data) and Article 11 (freedom of expression and information) of the European Convention on Human Rights (ECHR).

This case is relevant to take into account as it mentions "aggregating data sets could create an extremely accurate picture of an individual's life since, given enough raw data, algorithms and powerful computers could generate a substantial picture of the individual and his or her patterns of behaviour without ever accessing content."[35] One of the contentions raised was also that "surveillance programmes should not be considered independently but should instead be viewed in relation to the entirety of a nation's surveillance activities as machine learning, through which mathematical algorithms could draw inferences from collections of data, had increased the invasiveness of big data sets and data mining".[36]

A search of the UK Supreme Court website for specific cases[37] did not produce specific cases but a large number of general results (that might be relevant depending on the circumstance).

Our general search for cases and judgments in databases such as BAILII and 5RB, highlighted cases on trade marks (domain name disputes[38]) including the word 'robot' in some form, damages for destruction of goods (in this case, a robot wars set)[39], accidents related to industrial robots (e.g., inadequate robot safety causing death of worker[40]), revocation of patent (robotic lawn-mowers[41]), libel suits (considering use of web-crawling robots[42]), liability in relation to automated search engines services[43] etc.

Highlight any other relevant, potential future legal developments relating to AI and robotics identified in authoritative legal sources[44] in your country

New laws may be less likely to be developed but we anticipate other forms of governance. This will include the creation of regulatory (advisory) bodies and other oversight mechanisms. These will likely follow some of the recommendations in the House of Commons Science and Technology Committee report, *Algorithms in decision-making*, such as:[45]

[35] Cf. *"A Democratic Licence to Operate: Report of the Independent Surveillance Review ("ISR").*
[36] Submission of *Access Now*.
[37] Using search terms: 'artificial intelligence/machine learning +privacy/discrimination/inequality/harms and robot+privacy/discrimination/inequality/harms
[38] E.g., *Robot Wars Limited Robot Wars LLC v Mr Denys Ostashko* (Full Decision No Action) [2013] DRS 12519 (14 May 2013); *Friendly Robotics v Mr Donald Wilson* (Summary Decision No Action) [2013] DRS 12695 (04 June 2013)
[39] *Robot Arenas Ltd & Anor v Waterf1eld & Anor* [2010] EWHC 115 (QB) (08 February 2010)
[40] *R v Gallaher* (JTI) Ltd [2012] NICC 32 (26 October 2012)
[41] *Positec Power Tools (Europe) Ltd & Ors v Husqvarna AB* [2016] EWHC 1061 (Pat) (10 May 2016)
[42] *Budu v The British Broadcasting Corporation* [2010] EWHC 616 (QB) (23 March 2010)
[43] *Metropolitan International Schools Ltd v Designtechnica Corporation & Ors* [2009] EWHC 1765 (QB)
[44] We looked at official green or white papers, parliamentary or law commission reports.
[45] House of Commons Science and Technology Committee*, Algorithms in decision-making. Fourth Report of Session 2017–19,* 15 May 2018.
https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/351/351.pdf

- Closer monitoring "to ensure that the oversight of machine learning-driven algorithms continues to strike an appropriate and safe balance between recognising the benefits (for healthcare and other public services, for example, and for innovation in the private sector) and the risks (for privacy and consent, data security and any unacceptable impacts on individuals)."
- The government would continue to make public sector datasets available, not just for 'big data' developers but also algorithm developers and identify a ministerial champion to provide government-wide oversight of such algorithms, where they are used by the public sector, and to co-ordinate departments' approaches to the development and deployment of algorithms and partnerships with the private sector.
- Crown Commercial Service should commission a review, from the Alan Turing Institute or other expert bodies, to set out a procurement model for algorithms developed with private sector partners which fully realises the value for the public sector.
- The Centre for Data Ethics & Innovation would engage with other like-minded organisations in other comparable jurisdictions in order to develop and share best practice.

The Law Commission of England and Wales along with the Scottish Law Commission in its three-year project on automated vehicles (starting March 2018) is considering a wide variety of areas of law, ranging from road traffic legislation to product liability and examining at the use of automated vehicles as part of modern public transport networks and on-demand passenger services.[46] The Law Commissions seek "to propose a legal framework which can remain effective in light of new vehicles that may no longer require a human driver at all times".[47] The review will cover road-based automated vehicles. Automated vehicles are defined as "vehicle that is capable of driving "itself" – not being controlled or monitored by an individual, for at least part of a journey". The project will not cover drones or vehicles designed solely for use on pavements. The Commission has confirmed that while data protection and privacy, theft and cybersecurity and land use policy will be integral and inform the review, they are outside its scope. The Commissions have further clarified that while ethical considerations are relevant, they will "maintain a focus on the legal requirements and seek to avoid judging what may or may not be desirable ethical outcomes."[48]

Provide any additional information that might be relevant (and not considered above).

Some commentators think specialist legislation may emerge. Bergin and Tannock suggest that "Legislative changes such as GDPR will bring changes to the applicable rules in relation to AI enabled gathering and processing of personal data. In other areas, such as AI enabled automated vehicles, specialist legislation seems likely and advisable. Changes seem likely in the common law too. For example, common-law rules in relation to negligence and vicarious liability are of cross-sectoral application and will, doubtless, be updated and applied in the modern context by the courts."[49]

[46] Law Commission, "Automated vehicles". Undated. https://www.lawcom.gov.uk/project/automated-vehicles/
[47] Ibid.
[48] Law Commission, "Automated vehicles". Undated. https://www.lawcom.gov.uk/project/automated-vehicles/
[49] Bergin, Terence QC and Quentin Tannock**, "**AI: Changing Rules for a Changed World", *Society for Computers and Law,* 18 May 2018. https://www.scl.org/articles/10208-ai-changing-rules-for-a-changed-world

4. Specific legal issues

This section explores selected specific legal issues[50] related to AI and robotics. We explore/elaborate, for AI, two critical issues by examining legislation and legal discourse:

- Algorithmic bias and discrimination (including automated decision-making systems). How does the law deal with issues of algorithmic bias and discrimination?
- Intellectual property issues related to works created by AI. Does the law ascribe intellectual property rights (e.g., copyright, patent right, design rights, trademarks etc) for AI generated works or inventions? Who owns such intellectual property rights?

For robotics, we will explore:

- Creation of a specific legal status for robots or legal personhood or electronic personality. Has the law created or does the law recognise a specific legal status for robots? Are there any movements in this direction?
- Safety and civil liability issues: who is liable for damage caused by robots?

4.1. Artificial intelligence

4.1.1. Algorithmic bias and discrimination

Algorithmic bias and discrimination would fall within the scope of the Equality Act 2010[51] (EA 2010) even though the Act itself does not mention algorithms. The Act harmonises discrimination law and strengthens the law to support progress on equality. It protects against discrimination on the basis of characteristics such as age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation. Prohibited conduct includes direct discrimination, combined discrimination and indirect discrimination. Other prohibited conduct includes harassment and victimisation.

Section 29 of the Equality Act has been stated to be particularly relevant to the AI context[52] – this section deals with the provision of services by a person (a "service-provider") to the public or a section of the public (for payment or not) who must not discriminate against a person requiring the service by refusing to provide it. It also states that a person must not, in the exercise of a public function that is not the provision of a service to the public or a section of the public, do anything that constitutes discrimination, harassment or victimisation. Bickerstaff[53] suggests the Act applies "perfectly well to service providers using AI" and even free IT services – such as "search engines,

[50] Note, the SIENNA team chose following specific legal issues for further study based on the following criteria: (a) their prominence in legal and policy discussions at the international and regional level, (b) their prevalence in policy and legal academic discussions and (c) their potential to impact ethical values and human rights.
[51] Derived from obligations under European Union law.
[52] Bickerstaff, Roger, "Does your machine mind? Ethics and potential bias in the law of algorithms", *Digitalbusiness.law,* 19 June 2017. http://digitalbusiness.law/2017/06/does-your-machine-mind-ethics-and-potential-bias-in-the-law-of-algorithms/#page=1
[53] Bickerstaff, op. cit., 2017.

online marketplaces, online recruitment agencies", "where these services utilise algorithms in the provision of the services to the public these services would be subject to the Act". [54]

Algorithmic bias and discrimination might also violate the Human Rights Act 1998[55] if it affects the enjoyment of one or more rights guaranteed by the Act (e.g., Article 14). It covers discrimination on grounds such as sex, race, colour, language, religion, political or other opinion, national or social origin, association with a national minority, property, birth or other status. The Equality and Human Rights Commission highlights that the Act also includes sexual orientation, illegitimacy, marital status, trade union membership, transsexual status and imprisonment and suggests it can be used to challenge discrimination on the basis of age or disability. The Act protects against both direct and indirect discrimination. For instance, when a "rule or policy, supposedly applying to everyone equally, actually works to the disadvantage of one or more groups"[56]).

The General Data Protection Regulation (GDPR)[57] and the Data Protection Act 2018 contain (albeit indirectly) safeguards against automated decisions, including those based on profiling that have a legal or similarly significant effect on individuals. Such profiling automated decisions could have discriminatory effects under certain circumstances. Article 22 (1) of the GDPR states, "The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her." While the types of effect are not defined in the GDPR, the Information Commissioner's Office clarifies that "the decision must have a serious negative impact on an individual to be caught by this provision".[58] Furthermore, the GDPR, seeks to prevent discrimination by imposing more stringent requirements on the processing of certain special categories of personal data in its Articles 9 and 10. Such protection is afforded to personal data that relates to racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, genetic or biometric data, health data or data relating to sexual orientation or a person's sex life, as well as a person's criminal convictions.

As clarified by the *Government response to House of Lords Artificial Intelligence Select Committee's Report on AI in the UK: Ready, Willing and Able*[59], "the Data Protection Act 2018 reflects the need to ensure there are stringent provisions in place to appropriately regulate automated processing".[60] The Act provides safeguards for automated decision-making (section 14, 50), a right not to be subject to automated decision-making (sections 49, 96), the right not to be subject to automated decision-making (section 96), and the right to intervene in automated decision-making (section 97) etc.

[54] Bickerstaff, op. cit., 2017.
[55] The UK Human Rights Act 1998 gives further effect to rights and freedoms guaranteed under the European Convention on Human Rights.
[56] https://www.equalityhumanrights.com/en/human-rights-act/article-14-protection-discrimination
[57] Note, that the GDPR forms part of the data protection regime in the UK, along with the new Data Protection Act 2018 (DPA 2018). Both are in effect from 25 May 2018.
[58] ICO, "Rights related to automated decision making including profiling". https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/individual-rights/rights-related-to-automated-decision-making-including-profiling/
[59] https://www.parliament.uk/documents/lords-committees/Artificial-Intelligence/AI-Government-Response.pdf
[60] Ibid.

As outlined by Robin Allen QC and Dee Masters, though limited in scope, "the DPA 2018 and the GPDR are more helpful in relation to the data sets used by algorithms and as part of machine learning since the data subject has a right to access personal data that is being processed about them. This may allow potential claimants to understand if discriminatory data sets are being utilised which could in turn be used to bring claims under the EA 2010."[61]

4.1.2. Intellectual property issues related to works created by AI

UK law protects computer-generated works. Section 9(3) of the Copyright, Designs and Patents Act (CDPA) expressly lays down the position that "[i]n the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."[62] A computer-generated work is defined as "work […] generated by computer in circumstances such that there is no human author of the work".[63] Guadamuz suggests that "the idea behind such a provision is to create an exception to all human authorship requirements by recognizing the work that goes into creating a program capable of generating works, even if the creative spark is undertaken by the machine."[64] He suggests that "granting copyright to the person who made the operation of artificial intelligence possible seems to be the most sensible approach, with the UK's model looking the most efficient".[65] One law firm highlights that,

> As AI becomes more advanced, and the tasks allocated to AI allow the AI system more freedom to make its own decisions, it may become increasingly difficult to say with certainty who created or made the arrangements necessary for the creation of a given work – or indeed whether anyone made the necessary arrangements at all. In the scenario where the AI is fully autonomous, if no person made the arrangements necessary for the creation of a work which requires originality for copyright to subsist, then no copyright could exist in the work as there would be no author.[66]

With regard to patentability of computer-generated works in the UK, there is no express legal provision. Stephens and Bond discuss the challenges with patenting AI systems and platforms. They outline that English courts have been more ready than other jurisdictions to find AI-related inventions non-patentable.[67] They further confirm that "under the current law, it is not possible for the AI itself to be considered the inventor. Inventorship, like authorship, is considered a human

[61] Allen, Robin, QC and Dee Masters, "Algorithms, apps & artificial intelligence 2: Can data protection laws be used to challenge discriminatory tech?", *Cloisters.com*, 4 July 2018. https://www.cloisters.com/images/machine_learning_blog_July_2018.pdf

[62] https://www.legislation.gov.uk/ukpga/1988/48/contents. Authorship of computer-generated works was considered in *Nova Productions Ltd v Mazooma Games Ltd & Ors* (CA) [2007] EWCA Civ 219 and *Bamgboye v Reed & Others* [2002] EWHC 2922 (QB).

[63] Section 178, CDPA.

[64] Guadamuz, Andres, "Artificial intelligence and copyright", *WIPO Magazine,* October 2017. http://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html

[65] Guadamuz, op.cit, 2017.

[66] Clifford Chance, "AI and IP: copyright in AI-generated works (UK law). Can copyright subsist in an AI-generated work?", *TalkingTech*, 14 May 2018. https://talkingtech.cliffordchance.com/en/ip/copyright/ai-and-ip--copyright-in-ai-generated-works--uk-law-.html

[67] Stephens, Katharine and Toby Bond, "Artificial intelligence: Navigating the IP challenges", *PLC Magazine*, July 2018, pp. 39-45. [p. 42]. https://www.twobirds.com/~/media/pdfs/ai--navigating-the-ip-challenges-plc-magazine-june-2018.pdf?la=en

activity".[68] Stephens and Bond underline an important issue. They suggest "in attributing patents to people who are not the inventors, the real inventor, the AI system, is not being acknowledged. However, the consequence in adopting the position of AI as inventor is that, as the law presently stands, the invention could fall into the public domain."[69] They, therefore, suggest that it would be "sensible to provide for the question of ownership of any AI-related inventions by way of agreement[70] rather than leaving it to the IPO and the courts to resolve the issue". [71]

The law offers different types of design[72] protection. For example, copyright, unregistered design rights (automatic) and registered design rights.[73] The creator of the AI design owns such rights except if the work was commissioned or created during the course of employment. In this latter case, the rights belong to the employer or party that commissioned the AI work.[74]

Under the Trade Marks Act 1994, a registered trade mark[75] is a property right obtained by the registration of the trade mark and the proprietor[76] of a registered trade mark has rights and remedies. Since it is in the nature of a property right, and a registered trade mark is personal property (in Scotland, incorporeal moveable property), unless an AI system was able to hold/have personal property, this right might not apply or be able to be enjoyed by the AI system.

4.2. Robotics

This section examines robotics-related issues, in particular the creation of a specific legal status for robots and safety and liability issues. The search terms used included 'robots', 'autonomous systems', 'drone' and 'driverless/self-driving cars'.

4.2.1. Creation of a specific legal status for robots

Robots do not have a specific legal status in the UK.

Bayern et al suggest that "companies of various kinds can serve as a mechanism through which autonomous systems might engage with the legal system".[77] They state, "company law might furnish the functional and adaptive legal "housing" for an autonomous system" and suggest how existing laws in various jurisdictions, including the UK, might provide a potentially unexpected regulatory

[68] Stephens and Bond, op. cit., 2018, p. 43.
[69] Ibid.
[70] E.g., commercial and development agreements.
[71] Stephens and Bond, op. cit., 2018, p. 43.
[72] The appearance of a product, in particular, the shape, texture, colour, materials used, contours and ornamentation. https://www.copyrightservice.co.uk/protect/p15_design_rights
[73] https://www.gov.uk/register-a-design
[74] https://www.copyrightservice.co.uk/protect/p15_design_rights
[75] A "trade mark" means any sign capable of being represented graphically which is capable of distinguishing goods or services of one undertaking from those of other undertakings.
[76] A person thus entitled to prevent the use of a trade mark is referred to in the Trade Marks Ac 1994 as the proprietor of an "earlier right" in relation to the trade mark.
[77] Bayern, Shawn, Thomas Burri, Thomas D. Grant, Daniel M. Häusermann, Florian Möslein, and Richard Williams, "Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators" 9 *Hastings Science and Technology Law Journal* 2, Summer 2017, pp. 135 - 162. http://dx.doi.org/10.2139/ssrn.2850514

framework for autonomous systems. In their work, they explore some legal consequences of this possibility.[78] They expressly suggest,

> The flexibility that characterizes the LLP in UK law offers two potential ways in which an autonomous system could interact with the legal system with no direct human intervention. The first could be termed a "soft" arrangement whereby an LLP is formed by two corporate members who then adopt the acts of an autonomous system as the acts of the LLP in their LLP agreement on the basis of the *algorithm-agreement equivalence principle.*[79] The first step in this process should be uncontroversial. The second step—that is, adoption of the acts of an autonomous system as the acts of the LLP—is novel, but there is nothing *in principle* that should prevent such an agreement from being concluded given the contractual nature of LLP agreements and the general emphasis on respect for party autonomy that is at the heart of the LLP regime.

While Bayern et al, recognise that the above is speculative and to their knowledge not been tested, they strongly believe that "the most successful approach is likely to be that which retains traditional membership of the LLP by at least two members. More generally, UK courts have taken a pragmatic approach to the development and use of corporate personalities in the past. Taken forward, this flexibility could readily accommodate technological advances in artificial intelligence", and even though there might be many practical and theoretical problems, they think that "the flexibility inherent in UK corporate law develops in a manner that allows autonomous systems, as an increasingly present commercial fact, to inhabit corporate forms in a way that approximates to some form of legal personhood".[80]

Some commentators such as Bryson consider conferring legal personhood on purely synthetic entities will become a very real legal possibility, but think such "legislative action would be morally unnecessary and legally troublesome".[81]

4.2.2. Safety and civil liability issues: who is liable for damage caused by robots?

There is much legal commentary on robot safety and liability issues, though sometimes these areas are seen often as "legally grey" particularly in relation to ascribing liability. We examine some examples.

The example of *driverless cars* is oft-cited in examining safety and liability.[82] The Automated and Electric Vehicles Act 2018 regulates the liability of insurers of automated vehicles. It specifies the

[78] We note, for instance in David Runciman's *How Democracy Ends,* 2018, which argues that many of the concerns about AI (what if we can't control it, how much transparency can we have, how can the state regulate it) were previously expressed about the corporation. Regulatory approaches might be similar and could learn from the mistakes made in the regulation of the corporation.
[79] Whittaker, John and John Machell, *The Law Of Limited Liability Partnerships* 9.5, 3rd ed., Bloomsbury, 2009.
[80] Bayern et al, op. cit., 2017.
[81] Bryson, Joanna J., Mihailis E. Diamantis, and Thomas D. Grant, "Of, for, and by the people: the legal lacuna of synthetic persons," *Artificial Intelligence and Law,* 25, 3, 2017, pp. 273-291.
[82] Out-Law.com, "Driverless car laws will lead to 'trench warfare' on liability, warns UK peer", *Out-Law.com*, 22 Feb 2018. https://www.out-law.com/en/articles/2018/february/driverless-car-laws-will-lead-to-trench-warfare-on-liability-warns-uk-peer/; Out-Law.com, "Urgent' changes in the law necessary before driverless cars can go mainstream, survey finds", *Out-Law.com*, 14 July 2016. https://www.out-law.com/en/articles/2016/july/urgent-changes-in-the-law-necessary-before-driverless-cars-can-go-mainstream-survey-finds/

rules on listing of automated vehicles by the Secretary of State to allow for manufacturers, owners of vehicles and insurers to know if the scope of this legislation applies to their vehicle. Section 2(1) places liability for an accident caused by an automated vehicle on a road or other public place in Great Britain, first on the insurer if the vehicle is insured. Subsection (2) also places the same liability on certain types of owners where the vehicle is not insured, for example where it is exempt from compulsory third party insurance under Section 144(2) of the Road Traffic Act 1988 (such as in the case of vehicles owned by a local authority, a police body, a health authority or an NHS trust). As compared with the compulsory insurance cover for conventional vehicles under Section 145 of the Road Traffic Act 1988, the insurer's liability under subsection (1) has been widened to include damage to the driver where the automated vehicle is driving itself.

The Automated and Electric Vehicles Act 2018 further regulates (section 4) accidents resulting from unauthorised alterations or failure to update software and allows insurers to exclude or limit their liability to the insured person for accidents caused by the vehicle's software being altered in breach of the insurance policy, or by safety-critical software updates not being applied. This applies, subject to various conditions regarding the level of knowledge of the insured person or policyholder about the need for updates or about related insurance policy requirements. It provides a right of insurer to claim against person responsible for accident. If Section 2 imposes an initial liability on the insurer or owner of the automated vehicle in respect of the accident, Section 5 provides that any other person liable to the injured party in respect of the accident is under the same liability to the insurer or vehicle owner. The Section defines when and how the amount of such a person's liability is settled. It outlines when their right of action accrues, how the amount of such a person's liability is settled and when their right of action accrues. It also sets out arrangements and limits on the amounts they can recover.)

Focusing on the insurer's liability, Subsection (6) of the Act provides that the liability on the insurer cannot be limited, except when Section 4 applies. Subsection (7) ensures that the liability imposed on the insurer does not undermine their right of recovery from parties who are responsible for an accident. The Act also applies contributory negligence principles to the apportioning of liability in relation to accidents involving automated vehicles, where the injured party to some extent caused the accident or the damage resulting from it. Thus, there is now a clear regulatory framework governing liability of automated and electric vehicles.

Personal drone users are regulated by the Civilian Aviation Authority (CAA) Air Navigation Order 2016, specifically Article 241 (endangering the safety of any person or property), Article 94 (small unmanned aircraft) and Article 95 (small unmanned surveillance aircraft). Individuals have been, prosecuted for violating these provisions.[83] Commercial drone users need permission from the CAA in order to operate a drone.[84] Drone use for the Ministry of Defence is regulated by the Military Aviation Authority (MAA) pursuant to Regulatory Articles 1600[85], 2320[86] and most pertinently 2321[87].

[83] Ministry of Defence and Military Aviation Authority, "Drones – are you flying yours safely? (and legally?)", 28 Sept 2017. https://www.gov.uk/government/news/drones-are-you-flying-yours-safely-and-legally
[84] Ibid. The CAA requires such users to attend an accredited course that will trains them and assesses ability to safely operate drones (assessment of flying competence, knowledge of the law, risk assessments, decision making etc).
[85] https://www.gov.uk/government/publications/regulatory-article-ra-1600-remotely-piloted-air-systems-rpas
[86] https://www.gov.uk/government/publications/regulatory-article-ra-2320-role-specific-remotely-piloted-air-systems-rpas

Safety and liability issues also fall within the purview of consumer law and the regime of product liability.[88] For example, where safety issues arise because robotics goods sold to the consumer are not fit for the purpose for which they are supplied, are unsafe or suffer from defects, or are not durable. The law also protects consumers for example in cases of fraud, death and personal injury from any contractual exclusions of liabilities by traders. Liability might be incurred by the trader, service provider, manufacturer, supplier of goods and services. The Consumer Rights Act 2015 also regulates attempts to deny liability (e.g., via exclusion notices) for a good where there in fact might exist a liability.

The flexibility of the tort of negligence "means that it can be used by the courts to find liability in novel contexts".[89] In the case of robots, this could apply if one could prove the existence of a duty of care,[90] (damage suffered must be foreseeable; there was proximity between the victim suffering a damage and the defendant; and that in all the circumstances it would be fair, just and reasonable to impose liability on the defendant), as well as that there was a breach of that duty which then caused damage to be suffered (a causal link).

One recent notable development is the ruling of the inquest held after a patient died after an operation at the Freeman Hospital, Newcastle, in 2015.[91] The coroner ruled the death was a "direct consequence of the operation and its complications" and that the patient "died due to complications of an operation to treat mitral valve disease and, in part, because the operation was undertaken with robotic assistance".[92] She also said there remained a risk of further deaths and she would contact the Royal College of Surgeons and the Department of Health to ask them to consider whether national guidelines should be brought in. Here, one of the key issues was the lack of training by the lead surgeon on the Da Vinci robot used in the operation – a clear cut case for a finding of negligence and imposition of liability.

4.3. Other key specific legal issues

We now discuss one key issue at the forefront of the legal discussion in the UK in relation to AI and robotics. This is the use of algorithms in policing decision-making and the justice system.

[87] https://www.gov.uk/government/publications/regulatory-article-ra-2321-class-ib-remotely-piloted-air-systems-operator-qualifications-and-requirements
[88] I.e., Consumer Rights Act 2015, supported by other Regulations. The Consumer Rights Act extends to England and Wales, Scotland and Northern Ireland (however, section 27 extends only to Scotland and Chapter 3 of this Part extends only to England and Wales).
[89] BIICl, "Introduction to English Tort Law".
https://www.biicl.org/files/763_introduction_to_english_tort_law.pdf
[90] *Donoghue v Stevenson* [1932] AC 562; *Caparo v Dickman* [1990] 2 AC 605
[91] BBC News, "Newcastle robot surgery inquest: 'Risk of further deaths'", *BBC News*, 8 November 2018.
https://www.bbc.co.uk/news/uk-england-tyne-46143940
[92] Ibid.

There has been increased attention[93] to police decision algorithms and calls for their regulation, even though the use of these is not yet widespread.[94] Blacklaws identifies three uses of algorithmic data or intelligence analysis in policing: i. predictive policing on a macro-level incorporating strategic planning, prioritisation and forecasting; ii. operational intelligence linking and evaluation which may include, for instance, crime reduction activities; and iii. decision-making or risk-assessments relating to individuals.[95]

A study[96] published by the Royal United Services Institute (RUSI)[97] outlines,

> A new regulatory framework is needed, one which establishes minimum standards around issues such as transparency and intelligibility, the potential effects of the incorporation of an algorithm into a decision-making process, and relevant ethical issues. A formalised system of scrutiny and oversight, including an inspection role for Her Majesty's Inspectorate of Constabulary and Fire and Rescue Services, is necessary to ensure adherence to this new framework.[98]

The Law Society called for written evidence from all interested parties on algorithms in the justice system.[99] The objective was to explore the use of algorithms in the justice system in England and Wales and what controls, if any, are needed to protect human rights and trust. Some of the key points, raised by expert evidence at the first session that was focussed on the current state of algorithms in the justice system and what is on the horizon, included:

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[93] Cross, Michael, "Call for regulation of police decision algorithms", *The Law Society Gazette, 17 Sept 2018.* https://www.lawgazette.co.uk/news/call-for-regulation-of-police-decision-algorithms-/5067630.article#mobilemenu; Hill, Rebecca, "UK cops run machine learning trials on live police operations. Unregulated. What could go wrong? – report" *The Register, 21 September 2018.* *https://www.theregister.co.uk/2018/09/21/cops_use_of_machine_learning_is_a_minefield_of_poor_research_evidence_and_regulation/;* Lander, Serena, "Police machine learning may have 'unintended consequences that are difficult to anticipate'", *Police Professional*, 24 September 2018. https://www.policeprofessional.com/news/police-machine-learning-may-have-unintended-consequences-that-are-difficult-to-anticipate/ ; Shropshire Star, "Call to regulate police use of Minority Report-style crime prediction software", *Shropshire Star*, 21 Sept 2018. https://www.shropshirestar.com/news/uk-news/2018/09/20/call-to-regulate-police-use-of-minority-report-style-crime-prediction-software/; Burgess, Matt, "UK police are using AI to inform custodial decisions – but it could be discriminating against the poor", *Wired.co.uk*, 1 March 2018. https://www.wired.co.uk/article/police-ai-uk-durham-hart-checkpoint-algorithm-edit ; BBC news, "Police warned about using algorithms to decide who's locked up", *BBC news*, 16 Nov 2017. https://www.bbc.co.uk/news/uk-politics-41996422

[94] Only 14% of UK police forces were estimated to be using algorithmic data analysis or decision-making for intelligence work. Oswald, Marion, and Jamie Grace, 'Intelligence, policing and the use of algorithmic analysis: a freedom of information-based study', *Journal of Information Rights, Policy & Practice*, Vol 1, No. 1, 2016. https://journals.winchesteruniversitypress.org/index.php/jirpp/article/view/16

[95] Blacklaws, Christina, "The use of algorithms in the justice system in England and Wales", at London Technology Week 2018. http://www.lawsociety.org.uk/news/speeches/use-of-algorithms-in-justice-system-england-wales/

[96] Babuta, Alexander, Marion Oswald and Christine Rinik, "Machine Learning Algorithms and Police Decision-Making Legal, Ethical and Regulatory Challenges", Whitehall Report 3-18, 2018. https://rusi.org/sites/default/files/201809_whr_3-18_machine_learning_algorithms.pdf.pdf

[97] The world's oldest and the UK's leading defence and security think tank.

[98] Babuta, Oswlad and Rinik, op.cit., 2018.

[99] The Law Society, "Technology and the Law Policy Commission - Algorithms in the Justice System". http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/

- Risk of future data distortion[100]
- Problems in connection with the accuracy of results, correctness of decisions, systemic consequences on the justice system or wider society[101]
- Issues of using datasets with embedded historic bias or discrimination to train such systems resulting in the bias of such systems[102]
- Opacity of machine learning algorithmic systems that challenge transparency[103]
- Changes in role of algorithmic systems: from decision-support to decision-making[104]
- Changes to be made to the existing legal framework to accommodate and legitimise the use of algorithms and AI (general and sector-specific) and introduction of legal constraints to control the use of algorithms and AI (a light-touch approach including registration/notification, transparency obligations and legal remedies)[105]
- the integrity of the community's thinking across punitive ex post and preventive ex ante criminal justice.[106]

5. Brief analysis of gaps and challenges

In their evidence to the House of Lords Select Committee on Artificial Intelligence, the Law Society of England and Wales suggested that "that there is no obvious reason why the growth of AI and the use of data would require further legislation or regulation".[107] They further added, "AI is still relatively in its infancy and it would be advisable to wait for its growth and development to better understand its forms, the possible consequences of its use, and whether there are any genuine regulatory gaps".[108]

[100] Hand, David J., "A note on algorithms in the justice system", July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[101] Schafer, Burkhard, "Discussion notes for the Law Society's Public Policy Technology and Law Commission", July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/ ; Brownsword, Roger, "Crime, technological management and questions for the community's social licence". Witness evidence, July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[102] Edwards, Lilian, "Evidence to Law Society Inquiry into criminal justice algorithms" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[103] Edwards, Lilian, "Evidence to Law Society Inquiry into criminal justice algorithms" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[104] Edwards, Lilian, "Evidence to Law Society Inquiry into criminal justice algorithms" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[105] Bickerstaff, Roger, "Notes for the for the Law Society's Public Policy Technology and Law Commission- Algorithms in the Justice System" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[106] Brownsword, Roger, "Crime, technological management and questions for the community's social licence". Witness evidence, July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
[107] House of Lords Select Committee on Artificial Intelligence*, Report of Session 2017–19, AI in the UK: ready, willing and able?,* HL Paper 100, March 2018, pp. 112-113. https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf
[108] Ibid.

Other experts also did not think more widespread legislation was needed[109], citing the adequacy of existing laws to cover AI and calling for a cautious approach. They advised against anything that is overly prescriptive[110], premature[111] or reactive.[112]

However, there were some suggestions that the government should produce policies and regulations to address the emergence of AI and the involvement of corporations in their "creation and operation".[113] There was also a suggestion that "we need to act now to prevent the perpetuation of injustice" and that "there are no guarantees of unbiased performance" for algorithms presently.[114] Bristows LLP argued "public trust in new technologies is directly affected by the amount of regulation that is put in place and so industries such as the aviation industry are often cited as examples where robust regulation increases public trust in an otherwise inherently risky process".[115]

The House of Lords Select Committee concluded that "Blanket AI-specific regulation, at this stage, would be inappropriate" and that "existing sector-specific regulators are best placed to consider the impact on their sectors of any subsequent regulation which may be needed".[116]

The House of Commons Science and Technology Committee highlighted earlier in 2018 that "the GDPR will provide helpful protections for those affected by algorithms and those whose data are subsumed in algorithm development, including more explicit consent requirements, although there remains some uncertainty about how some of its provisions will be interpreted".[117] It outlines that "the challenge will be to secure a framework which facilitates and encourages innovation but which also maintains vital public trust and confidence."[118]

One key consideration is whether the law is flexible enough to adapt to the challenges posed by AI and robotics. Based on past experience with dealing with new technological developments, we would conclude that it is; where it is not, space can be made for new regulations.

6. Conclusion

[109] House of Lords, op. cit., 2018. Written evidence from Professor Robert Fisher, Professor Alan Bundy, Professor Simon King, Professor David Robertson, Dr Michael Rovatsos, Professor Austin Tate and Professor Chris Williams (AIC0029)
[110] House of Lords, op. cit., 2018. Written evidence from Kemp Little LLP (AIC0133)
[111] House of Lords, op. cit., 2018. Written evidence from Electronic Frontier Foundation (AIC0199); Professor Chris Reed (AIC0055) and Professor Robert Fisher, Professor Alan Bundy, Professor Simon King, Professor David Robertson, Dr Michael Rovatsos, Professor Austin Tate and Professor Chris Williams (AIC0029)
[112] House of Lords, op. cit., 2018. Written evidence from Baker McKenzie (AIC0111)
[113] House of Lords, op. cit., 2018. Written evidence from Dr Sarah Morley and Dr David Lawrence (AIC0036)
[114] House of Lords, op. cit., 2018. Written evidence from the Foundation for Responsible Robotics (AIC0188)
[115] House of Lords, op. cit., 2018. Written evidence from Bristows LLP (AIC0097)
[116] House of Lords, op. cit., 2018.
[117] House of Commons Science and Technology Committee , "Algorithms in decision-making, Fourth Report of Session 2017–19", 15 May 2018.
https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/351/351.pdf
[118] Ibid.

As shown before, developments in AI and robotics have fostered parliamentary discussions and legal debate, but there has not yet been very specific movement in the UK to amend human rights legislation.

Engagement from the human rights perspective is still lacking even though some issues (e.g., discrimination, privacy infringements) related to underlying human rights have been addressed. We think that the discussion in the UK needs to move beyond its privacy and data protection-centricity towards addressing other highly impacted human rights such as the right to life, liberty and security of the person, freedom of thought and conscience.

There are pros and cons of both strong and light-touch regulation (the latter of which has been advocated[119] for the UK). In line with evidence given by legal experts to the UK House of Lords AI Select Committee, we recommend a cautious approach to avoid the adverse effects of hasty and ill-considered regulation.

As the UK progresses in its leadership in the governance of AI and robotics, new challenges will emerge, and old ones will become redundant or get resolved through technical (such as privacy by design, certification) or ethical measures (e.g., Codes of conduct). While this might not suffice in all cases, and as the law is the ultimate guardian, especially since AI and robotics applications will have myriad effects upon society, the situation must be closely monitored and where required, new laws developed, potentially on a sectoral basis.

References

Legislation

1. Automated and Electric Vehicles Act 2018, 2018 c.18.
2. Civilian Aviation Authority (CAA), Air Navigation Order 2016, 2016 No. 765.
3. Consumer Rights Act 2015, 2015 c. 15.
4. Copyright, Designs and Patents Act (CDPA), 1988 c. 48.
5. Council of Europe, European Convention for the Protection of Human Rights and Fundamental Freedoms, as amended by Protocols Nos. 11 and 14, 4 November 1950, ETS 5.
6. Data Protection Act 2018, 2018 c.12.
7. Human Rights Act 1998, 1998 c. 42.
8. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) *OJ L 119*, 4.5.2016, p. 1–88.
9. Road Traffic Act 1988, 1988 c. 52.
10. Trade Marks Act 1994, 1994 c. 26.

[119] Bickerstaff, Roger, "Light touch is the right touch for AI regulation", *The Law Society Gazette,* 30 July 2018. https://www.lawgazette.co.uk/commentary-and-opinion/light-touch-is-the-right-touch-for-ai-regulation/5067081.article. Such measures would include registration/notification, transparency obligations and legal remedies.

Cases

1. *Bamgboye v Reed & Others* [2002] EWHC 2922 (QB)
2. *Big Brother Watch and others v The United Kingdom, Applications nos. 58170/13, 62322/14 and 24960/15, European Court of Human Rights, 13 September 2018.*
3. *Budu v The British Broadcasting Corporation* [2010] EWHC 616 (QB) (23 March 2010)
4. *Donoghue v Stevenson* [1932] AC 562; *Caparo v Dickman* [1990] 2 AC 605
5. *Friendly Robotics v Mr Donald Wilson* (Summary Decision No Action) [2013] DRS 12695 (04 June 2013)
6. *Metropolitan International Schools Ltd v Designtechnica Corporation & Ors* [2009] EWHC 1765 (QB)
7. *Nova Productions Ltd v Mazooma Games Ltd & Ors* (CA) [2007] EWCA Civ 219
8. *Positec Power Tools (Europe) Ltd & Ors v Husqvarna AB* [2016] EWHC 1061 (Pat) (10 May 2016)
9. *R v Gallaher* (JTI) Ltd [2012] NICC 32 (26 October 2012)
10. *Robot Arenas Ltd & Anor v Waterf1eld & Anor* [2010] EWHC 115 (QB) (08 February 2010)
11. *Robot Wars Limited Robot Wars LLC v Mr Denys Ostashko* (Full Decision No Action) [2013] DRS 12519 (14 May 2013)

Other references

1. Abbott, Ryan, “Artificial Intelligence, Big Data and Intellectual Property: Protecting Computer-Generated Works in the United Kingdom”, in Tanya Aplin (ed.), *Research Handbook on Intellectual Property and Digital Technologies*, Edward Elgar Publishing Ltd, 2017/forthcoming. https://ssrn.com/abstract=3064213
2. Allen, Robin, QC and Dee Masters, “Algorithms, apps & artificial intelligence 2: Can data protection laws be used to challenge discriminatory tech?” *Cloisters.com*, 4 July 2018. https://www.cloisters.com/images/machine_learning_blog_July_2018.pdf
3. Babuta, Alexander, Marion Oswald and Christine Rinik, “Machine Learning Algorithms and Police Decision-Making Legal, Ethical and Regulatory Challenges”, Whitehall Report 3-18, 2018. https://rusi.org/sites/default/files/201809_whr_3-18_machine_learning_algorithms.pdf.pdf
4. Banzi, Geofrey, “The 'Morality Algorithm': Exploring the Legal, Social and Technological Regulatory Aspects to Autonomous Vehicle Use and Policy within the UK”, 13 July 2017. http://dx.doi.org/10.2139/ssrn.3001804.
5. Bayern, Shawn, Thomas Burri, Thomas D. Grant, Daniel M. Häusermann, Florian Möslein, and Richard Williams, “Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators” 9 *Hastings Science and Technology Law Journal* 2, Summer 2017, pp. 135 - 162. http://dx.doi.org/10.2139/ssrn.2850514
6. BBC News, “Newcastle robot surgery inquest: 'Risk of further deaths'”, *BBC News*, 8 November 2018. https://www.bbc.co.uk/news/uk-england-tyne-46143940
7. BBC news, “Police warned about using algorithms to decide who's locked up”, *BBC news*, 16 Nov 2017. https://www.bbc.co.uk/news/uk-politics-41996422

8. Bergin, Terence QC and Quentin Tannock**, "**AI: Changing Rules for a Changed World", *Society for Computers and Law,* 18 May 2018. https://www.scl.org/articles/10208-ai-changing-rules-for-a-changed-world
9. Bickerstaff, Roger, "Does your machine mind? Ethics and potential bias in the law of algorithms", *Digitalbusiness.law,* 19 June 2017. http://digitalbusiness.law/2017/06/does-your-machine-mind-ethics-and-potential-bias-in-the-law-of-algorithms/#page=1
10. Bickerstaff, Roger, "Light touch is the right touch for AI regulation", *The Law Society Gazette,* 30 July 2018. https://www.lawgazette.co.uk/commentary-and-opinion/light-touch-is-the-right-touch-for-ai-regulation/5067081.article
11. Bickerstaff, Roger, "Notes for the for the Law Society's Public Policy Technology and Law Commission- Algorithms in the Justice System" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
12. BIICI, "Introduction to English Tort Law". https://www.biicl.org/files/763_introduction_to_english_tort_law.pdf
13. Blacklaws, Christina, "The use of algorithms in the justice system in England and Wales", at London Technology Week 2018. http://www.lawsociety.org.uk/news/speeches/use-of-algorithms-in-justice-system-england-wales/
14. Brownsword, Roger, "Crime, technological management and questions for the community's social licence". Witness evidence, July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
15. Bryson, Joanna J., Mihailis E. Diamantis, and Thomas D. Grant, "Of, for, and by the people: the legal lacuna of synthetic persons," *Artificial Intelligence and Law,* 25, 3, 2017, pp. 273-291.
16. Burgess, Matt, "UK police are using AI to inform custodial decisions – but it could be discriminating against the poor", *Wired.co.uk*, 1 March 2018. https://www.wired.co.uk/article/police-ai-uk-durham-hart-checkpoint-algorithm-edit
17. Clifford Chance, "AI and IP: copyright in AI-generated works (UK law). Can copyright subsist in an AI-generated work?", *TalkingTech*, 14 May 2018. https://talkingtech.cliffordchance.com/en/ip/copyright/ai-and-ip--copyright-in-ai-generated-works--uk-law-.html
18. Cross, Michael, "Call for regulation of police decision algorithms", *The Law Society Gazette, 17 Sept 2018.* https://www.lawgazette.co.uk/news/call-for-regulation-of-police-decision-algorithms-/5067630.article#mobilemenu
19. Edwards L., & M. Veale "Slave to the Algorithm? Why a 'Right to an Explanation' is Probably Not the Remedy You Are Looking For", *Duke Law & Technology Review*, 16(1), 2017, pp. 18–84
20. Edwards L., & M. Veale, "Enslaving the Algorithm: From a "Right to an Explanation" to a "Right to Better Decisions"?" *IEEE Security & Privacy* 16(3), 2018, pp. 46-54
21. Edwards, Lilian, "Evidence to Law Society Inquiry into criminal justice algorithms" July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
22. Gov.uk, "Register a design". https://www.gov.uk/register-a-design
23. Government Office for Science, *Artificial Intelligence: opportunities and implications for the future of decision making*, November 2016. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566075/gs-16-19-artificial-intelligence-ai-report.pdf

24. Guadamuz, Andres, "Artificial intelligence and copyright", *WIPO Magazine,* October 2017. http://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html
25. Hand, David J., "A note on algorithms in the justice system", July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
26. Hill, Rebecca, "UK cops run machine learning trials on live police operations. Unregulated. What could go wrong? – report" *The Register,* 21 September 2018. *https://www.theregister.co.uk/2018/09/21/cops_use_of_machine_learning_is_a_minefield_of_poor_research_evidence_and_regulation/*
27. HM Government, *Government response to House of Lords Artificial Intelligence Select Committee's Report on AI in the UK: Ready, Willing and Able?* Presented to Parliament by the Secretary of State for Business, Energy and Industrial Strategy by Command of Her Majesty, CM 9645, June 2018. https://www.parliament.uk/documents/lords-committees/Artificial-Intelligence/AI-Government-Response.pdf
28. HM Government, *Industrial Strategy*, White Paper*,* 2017. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf
29. House of Commons Science and Technology Committee , "Algorithms in decision-making, Fourth Report of Session 2017–19", 15 May 2018. https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/351/351.pdf
30. House of Commons Science and Technology Committee, *The big data dilemma Fourth Report of Session 2015–16.* https://publications.parliament.uk/pa/cm201516/cmselect/cmsctech/468/468.pdf
31. House of Lords Select Committee on Artificial Intelligence*, Report of Session 2017–19, AI in the UK: ready, willing and able?,* HL Paper 100, March 2018, pp. 112-113. https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf
32. https://www.policeprofessional.com/news/police-machine-learning-may-have-unintended-consequences-that-are-difficult-to-anticipate/
33. Information Commissioner's Office, "Rights related to automated decision making including profiling". https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/individual-rights/rights-related-to-automated-decision-making-including-profiling/
34. Lander, Serena, "Police machine learning may have 'unintended consequences that are difficult to anticipate'", *Police Professional*, 24 September 2018.
35. Law Commission, "Automated vehicles". Undated. https://www.lawcom.gov.uk/project/automated-vehicles/
36. Law Pod UK, "Will AI outwit our laws", 6 June 2018. https://itunes.apple.com/us/podcast/law-pod-uk/id1259360349
37. Ministry of Defence and Military Aviation Authority, "Drones – are you flying yours safely? (and legally?)", 28 Sept 2017. https://www.gov.uk/government/news/drones-are-you-flying-yours-safely-and-legally
38. Ministry of Defence and Military Aviation Authority, *Regulatory Article (RA) 1600: remotely piloted air systems (RPAS),* 19 January 2015 (updated 2018). https://www.gov.uk/government/publications/regulatory-article-ra-1600-remotely-piloted-air-systems-rpas
39. Ministry of Defence and Military Aviation Authority, *Regulatory Article (RA) 2320: role specific remotely piloted air systems (RPAS)*, 14 November 2014 (updated 2018).

https://www.gov.uk/government/publications/regulatory-article-ra-2320-role-specific-remotely-piloted-air-systems-rpas

40. Ministry of Defence and Military Aviation Authority, *Regulatory Article (RA) 2321: class I(b) and class I(b) MIL remotely piloted air systems, operator qualifications and requirements,* 12 April 2016 (updated 2018). https://www.gov.uk/government/publications/regulatory-article-ra-2321-class-ib-remotely-piloted-air-systems-operator-qualifications-and-requirements
41. Oswald, Marion, and Jamie Grace, 'Intelligence, policing and the use of algorithmic analysis: a freedom of information-based study', *Journal of Information Rights, Policy & Practice*, Vol 1, No. 1, 2016. https://journals.winchesteruniversitypress.org/index.php/jirpp/article/view/16
42. Out-Law.com, "Driverless car laws will lead to 'trench warfare' on liability, warns UK peer", *Out-Law.com*, 22 Feb 2018. https://www.out-law.com/en/articles/2018/february/driverless-car-laws-will-lead-to-trench-warfare-on-liability-warns-uk-peer/;
43. Out-Law.com, "Urgent' changes in the law necessary before driverless cars can go mainstream, survey finds", *Out-Law.com*, 14 July 2016. https://www.out-law.com/en/articles/2016/july/urgent-changes-in-the-law-necessary-before-driverless-cars-can-go-mainstream-survey-finds/
44. Rab, Suzanne, "Legal systems in UK (England and Wales)", *Practical Law.* https://uk.practicallaw.thomsonreuters.com/5-636-2498?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1#co_anchor_a279982
45. Runciman, David, *How Democracy Ends,* 2018.
46. Schafer, B., D. Komuves, J.N. Zatarain, & L. Diver, "A fourth law of robotics? Copyright and the law and ethics of machine co-production", *Artificial Intelligence and Law*, vol. 23, no. 3, 2015, pp. 217-240
47. Schafer, Burkhard, "Discussion notes for the Law Society's Public Policy Technology and Law Commission" , July 2018. http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
48. Schafer, Burkhard, Lilian Edwards, ""I spy, with my little sensor": Fair data handling practices for robots between privacy, copyright and security", *Connection science*, Vol 29, 2017, pp. 200-209
49. Science and Technology Committee, *The big data dilemma, Fourth Report,* Session 2016-17, HC 468, 2016. https://publications.parliament.uk/pa/cm201516/cmselect/cmsctech/468/468.pdf
50. Shropshire Star, "Call to regulate police use of Minority Report-style crime prediction software", *Shropshire Star*, 21 Sept 2018. https://www.shropshirestar.com/news/uk-news/2018/09/20/call-to-regulate-police-use-of-minority-report-style-crime-prediction-software/
51. SIENNA, *D1.1: The consortium's methodological handbook*, 30 April 2018.
52. Stephens, Katharine and Toby Bond, "Artificial intelligence: Navigating the IP challenges", *PLC Magazine*, July 2018, pp. 39-45. https://www.twobirds.com/~/media/pdfs/ai--navigating-the-ip-challenges-plc-magazine-june-2018.pdf?la=en
53. The Law Society, "Technology and the Law Policy Commission - Algorithms in the Justice System".http://www.lawsociety.org.uk/policy-campaigns/articles/public-policy-technology-and-law-commission/
54. The UK Copyright Service, Fact sheet P-15: Designs and design rights, 29 July 2004. https://www.copyrightservice.co.uk/protect/p15_design_rights
55. Veale, M., R. Binns & L. Edwards, "Algorithms That Remember: Model Inversion Attacks and Data Protection Law**",** *Philosophical Transactions of the Royal Society,* 2018.

56. Wachter, S., B. Mittelstadt, and L. Floridi, "Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation", *International Data Privacy Law*, 7 (2), 2016, pp. 76-99.
57. Wachter, S., B.D.M Mittelstadt and C. Russell, "Counterfactual Explanations Without Opening the Black Box: Automated Decisions and the GDPR", *Harvard Journal of Law and Technology,* 31, 2, 2018.
58. Whittaker, John and John Machell, *The Law Of Limited Liability Partnerships* 9.5, 3rd ed., Bloomsbury, 2009.