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Artificial intelligence and the law: can we and should we regulate AI systems?

1 Introduction

In November 2022, the technology company OpenAI launched ChatGPT, a conversational chatbot utilising large-scale language models and machine learning techniques. The public reception of the launch was both excited and alarmistic: newspaper columns written with the chatbot’s help declared fundamental disruption of higher education, professional work and the creative arts, researchers framing this as a breakthrough in development of artificial intelligence (AI) systems for the general public. According to some, the comprehensive public demonstration of what general-purpose AI – of the large language model type – can do may also have disrupted the EU legislator (Volpicelli, 2023). The narratives that now highlight the significance of these developments in natural language processing are the latest in reflecting a long line of similar success stories: recurring hype, as in excitement and belief in cycles of AI development.

Similar narratives emerged in 1997 when IBM’s chess-playing expert system DeepBlue claimed the first win by computer over the reigning chess champion Garry Kasparov under tournament conditions. Why are we making this comparison between a chatbot of 2022 and a chess programme of 1997? For three reasons. First, through a contingent example, to demonstrate that we are currently in the middle of an intensive AI development phase. The most recent of disappointment and disillusionment cycles known as ‘AI winter’ (MacCorduck, 2004) that followed the most recent AI hype is definitely over. This is to say that AI hype and disillusionment are a repeating
pattern. In this chapter, we contextualise the particularities of the current AI debate in relation to the growing concern for the negative societal implications of AI deployment and the ensuing pressure to introduce new regulation to mitigate these risks – hype and disillusionment coinciding. Second, to highlight a diversity of methods, applications, and approaches that have become known as AI. AI can be many things but once successfully adopted to everyday life, we tend to find other words to describe these tools, a tendency called the ‘AI effect’ in research on the history of AI (MacCorduck, 2004; Haenlein & Kaplan, 2019). Is the present focus of regulative activities really AI or computational AI-assisted information systems? Third, to draw attention to the historical contexts and continuums in the relationship between artificial intelligence and the law. The past has shaped and informs current AI approaches and should also inform our understanding of the relationship between AI and law in its many forms. For example, using AI in legal contexts at the present stage of technological development is very different from predicting the next move in chess, moreover, reactively focusing on the negative effects of AI is a very different approach from the optimistic and proactive one of earlier legal scholarship on machine-simulated intelligence. To weigh and balance the related pros and cons of regulating the use of AI, both positive and negative effects require attention.

In this chapter we hope to provide an overview of the multifaceted research endeavours and fields that have aimed to conceptualise the relationship between law and AI. As it is impossible to do justice to this broad range of prior research dating back decades and continents, we approach the topic particularly from the perspective of AI regulation, focusing on the European Union’s much-debated up-coming Artificial Intelligence Act that introduces harmonised rules for placing on the market and on the use of AI systems across sectors.¹ What we find interesting, particularly in relation to the historical and methodological complexity hinted at above, is the political, legal, and technical debate about the meaning of AI. We believe this to be a useful entry point to many of the field’s prevailing discussions. On one hand, it is argued in technical terms that AI cannot be defined and hence AI regulation is doomed to fail. On the other, legal certainty and clear scope of application are necessary requirements for any new law. These argumentation patterns and tensions exemplify a stance we call the definition dilemma (for an overview, see e.g., Martin-Bariteau & Scassa, 2021).

¹ Proposal for an Artificial Intelligence Act (AIA) (COM/2021/206).
Another tension inherent in AI regulation can be located within the regulatory principle of technological neutrality, which requires policymakers to avoid favouring or discriminating against any particular use or form of technology over others (e.g., Briglauer, Stocker & Whalley, 2020). Hence the dilemma is: law regulating AI should be sufficiently neutral in terms of technology, yet exact enough to address the set of AI techniques or contexts of use deemed to be problematic. In any case, the definition dilemma may yet fade away with the creation of a legal definition by the AI Act, which will influence the AI industry as well as our conceptual understanding of AI well into the future – regardless of how well the definition succeeds to capture the multifaceted phenomena. At this stage, a working definition of AI is needed for this chapter. We perceive AI to be a diverse set of computational procedures or techniques (such as machine learning algorithms) that based on data, perform tasks to varying degrees of autonomy that would be considered intelligent if performed by humans (Turing, 1950). As we will demonstrate, AI methods and approaches have changed over time, yet the concept that relates to technology simulating human intelligence has remained the same. Against this backdrop, it is possible to perceive the AI Act as being targeted towards the design and use of computational techniques in general, and not just narrow regulation of the most popular contemporary AI approaches.

The EU’s initiative to regulate AI within the Single Market is not isolated from the global geopolitics of AI development and deployment, in which particularly the US and China have been forerunners. One aim of the EU Commission’s AIA proposal is to support the “objective of the Union of being a global leader in the development of secure, trustworthy and ethical artificial intelligence”, another is to encourage innovation. It is at least possible, if not even likely, that the AIA will influence AI development far beyond Europe, as companies comply with the standards set by the regulation to gain access to the economically desirable and (uniformly) regulated European market, as has happened with the General Data Protection Regulation. Furthermore,

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2 We build in part on Turing’s (1950, p. 440) classic definition here: “AI could be identified if a human interrogating the responses from both a computer and another human were unable to determine which response was produced by the computer”.
3 The AI Act (COM/2021/206), Recital 5 and e.g. 75.
4 GDPR (679/2016); As to the companies producing products or services, the Brussels effect further relies on the inelasticity of their target and non-divisibility of legal, technical and economic policies, according to Bradford (2012; 2020).
other jurisdictions are also considering AI regulation, e.g., Canada and the United States, and the European developments may yet produce baseline if not the gold standard for other regulatory initiatives.

Why do we need AI regulation? There is a growing consensus that the ubiquitous deployment of AI applications across societal fields has led to urgent legal problems such as algorithmic bias (Burkell, 2019), surveillance and predictive policing that target disproportionately exposed communities (Nachbar, 2020), hate speech on social media that limits the exercise of constitutional and democratic rights (Laukyte, 2023), unequal access to digital public services and healthcare (Toohey, Moore, Dart & Toohey, 2019; Veinot, Mitchell & Ancker, 2018), and insufficient liability regimes for AI-related harms (Wagner, 2019), to name but a few. None of these problems are completely new nor limited to only certain societies, yet many perceive that law is challenged in new ways due to the relatively autonomous nature of many AI applications and the difficulty of exerting human control or, in turn, allocating responsibility (e.g., Barfield & Pagallo, 2020; Beckers & Teubner, 2021).

Ultimately, we hope to emphasise the importance of historical and societal contexts as well as sectoral laws and situated practices, because we fear horizontal AI regulation is in danger of forgetting context. The danger exists within the AI regulation debate to consider AI, like many other technological applications and the problems they have brought forth, as something inherently unprecedented and novel, something that emerges from technological progress without historical or social context. Within the social sciences, the assumption that technology is ahistorical, apolitical and value-neutral has been contested and the political dimensions of technology and its use have been widely acknowledged and discussed (e.g. Feenberg, 2017; Mumford, 1964; Winner, 1985). Technological products affect society and its different groups in various ways, but technology as a product is shaped by human choices, interests and values, including laws (for more, see Koulu, 2021). As noted in relation to ethical guidelines for AI, ‘decontextualisation’ of technology may limit the policy debate by obscuring human behaviour, actions, and social structures as potential objects of regulation (Koulu, 2020). This stance is echoed by law and technology scholars Bennett Moses and Gollan who fittingly argue, “it is where legal scholarship focuses closely on a particular technology that the risk of ignoring history and the broader context
is greatest” (Bennett Moses & Gollan, 2016, p 1). In addition to documenting the current phase of legal scholarly and regulatory development for posterity, we hope to contribute to a critical discussion on the (im)possibility of regulating AI by offering a contextualisation of the current policy debate around AI to earlier and current legal scholarship.

Our task is divided into four steps. First, we draw on prior research on AI and law to provide a historical context to the current debate on AI regulation. By looking into prior research at the intersections of AI and law, we demonstrate a shift in perspective: today’s focus on regulation of AI by law is distinct from the focus in earlier research on applying AI methods in law. Yet these perspectives could contribute a depth of understanding to one another: for example, is a clear fixed definition of what constitutes AI is possible or necessary? Why have the open philosophical and economic questions related to simulating human intelligence remained? Second, our own targeted (non-systematic) literature review demonstrated – quite intendedly – the limitations of modern database searches for building an overview of the field. Critically analysing our sample against our expert knowledge of the field, it illustrates the difficulties anyone new to the field would face: less than perfect quality and hence limited value of results returned by databases using certain search criteria. We nevertheless analysed our sample to recognise trends and the current state on how legal scholars define AI and what AI-related problems they perceive as requiring new regulation. Third, in light of the history and state of the art we have laid out, we discuss the definition of AI, the regulatory objectives and choices made in the EU’s AI Act, and how the EU sought to reconcile the various objectives from market regulation to fundamental rights by a combination of definitions, forbidden AI practices, and requirements for high-risk AI systems. Finally, we provide some concluding remarks.

2 Earlier research on the intersections of law and AI

2.1 Origins of definitional difficulties

It is our understanding that current discussion about law and AI has a lot to gain from looking not only forward but also backwards to earlier research on law and technology, as this supports the endeavour to conceptualise and contextualise the challenge AI applications impose on law from a
comprehensive perspective. By drawing on earlier research, we were able to shed light on changing concepts of AI and legal responses to the increasing use of computational techniques in everyday life, which we then compared first with current scholarship on AI regulation and then with the regulatory debate within the EU.

*From AI methods for law into law for AI*

Legal scholarship has a rich tradition of research related to machine-simulated intelligence, dating back at least to late 1940s in Loevinger’s jurimetrics by which he referred to statistical analysis of law (Loevinger, 1949). A point of interest is the shift in focus. While the focus of current legal debate is on regulating AI applications across sectors to mitigate harm, pioneers in the AI & Law field from 1980s onwards pursued a different line of inquiry by focusing on the development and application of AI methods within the legal domain, with particular interest in automating legal reasoning and decision-making. Legal informatics combined law and information science perspectives to address issues related to the use of information, data storage, and retrieval (on legal informatics, see Bing, 1990; Contissa, Godano & Sartor, 2021; Pohle, 2021; Steinmüller, 1970). Early research traditions were often optimistic about the potential of computer applications in improving law and making it more objective, reasonable, and accessible (e.g., Blume, 1990; Mehl, 1958; Popple, 1990). More recent research on algorithmic regulation has been more critical, as negative consequences of AI deployment on protection of legal rights have also become more explicit (e.g., Yeung & Lodge, 2019). Recently, computational legal theory and research on law, technology, and society as well as legally oriented Science and Technology studies have made important contributions to conceptualising the entanglements between law and data-driven technologies (Diver, 2021; Leuenberger & Schafer, 2017; Cohen, 2019; Hildebrandt 2016; Jasanoff, 1997). Yet, despite that the histories of technology and of AI are established research fields, to our knowledge historical research into law and technology, including AI, remains underdeveloped.

*Rule-based modelling of legal reasoning*
In the 1960s and 1970s, much of AI development focused on building rule-based systems in which the computer executes ‘if-then’ commands pre-set by humans. Within law, the advocates of the rule-based approach saw their potential for modelling legal reasoning and ultimately automating decision-making. However, the application of rule-based modelling to law soon faced its limitations that result from law’s characteristics, such as Hart’s description of legal concepts as open texture that relies on interpretative flexibility of natural language, discretion, and human experience. Although the problem of law’s open texture was recognised by the pioneers, they were optimistic about solving it through theoretical analysis of legal concepts:

“The problem of making a "law machine" certainly involves a technical aspect. It will be necessary to find the type of machine capable of fulfilling this function, to determine the essential features of such a machine. However, any machine suitable for making selections will generally be suitable to a greater or lesser extent. The problem is thus essentially a theoretical and logical one. For solving it, we require more highly-evolved analysis of legal concepts than that to which we are accustomed, conducted in a different spirit, in some cases. It invites us to define new legal concepts which will combine easily and unequivocally” (Mehl, 1958, p. 758).

Time and time again, computer applications have revealed law to be more complex than anticipated. Also, Loevinger underestimated the challenge of developing computers to solve legal problems, which he believed already to be possible with the technology available in the 1940s. He considered the main obstacle to be the lack of suitable terms for computer processing of law:

“Machines are now in existence which have so far imitated "thought processes" that they can solve differential equations and other "logical" operations of equal or greater complexity. The machines can be constructed to solve equations with virtually any number of variables, and with large numbers of variables the operation is much faster than when performed by the human mind. Why should not a machine be constructed to decide lawsuits? The complexity of the problems presented, measured by the number of variables involved, is well within the limits of existing machines. The difficulty is that we have no terms to put into the machines, as the scientists have numbers and symbols” (Loevinger, 1949, p. 471).
From 1980s onwards AI & Law formed its own research field, which initially focused on rule-based expert systems and modelling of legal reasoning (Bench-Capon et al., 2021; Branting, 2000; Gardner, 1987; ICAIL, 1987). In a retrospective review of the field, Bench-Capon et al. considered one of its more important contributions to include bringing together rule-oriented logic-based systems and case-based approaches (Bench-Capon et al., 2012). Reflecting on the field’s progress across decades, the authors attributed the increases in the availability and scope of AI applications to the development of the World Wide Web, reduction in the cost of data storage, and increase in computing power, yet maintained that the field stays relevant due to its interdisciplinarity that enables information exchange across legal and mathematical sciences (Bench-Capon et al., 2012).

The WWW and constitutional risks of coded architectures

The late 1990s and early 2000s signified yet another shift in law and technology scholarship, which started to focus on issues loosely labelled as cyberspace law, following the prolific rise in the use and provision of online services once the World Wide Web enabled the public to access the Internet (For an overview, see e.g. Reed, 2012). Professor Lessig provided one of the more influential examinations of the theoretical underpinnings of cyberspace in his 1999 book Code and Other Laws of Cyberspace (Lessig, 1999), as he drew attention to the regulatory dimension of programmed architectures and how computer code replaces other sources of regulation in online environments. Lessig made explicit the connection between code and constitutional values, while considering the emergence of cyberspace as a watershed in technology regulation:

“It will present the greatest threat to both liberal and libertarian ideals, as well as their greatest promise. We can build, or architect, or code cyberspace to protect values that we believe are fundamental. Or we can build, or architect, or code cyberspace to allow those values to disappear. There is no middle ground” (Lessig, 2006, p. 6).

Alongside the growing awareness about the constitutional risks, the popularisation of the internet contributed to lowering the costs of data transfer and storage and computational processing. In
turn, these developments made possible data-driven AI approaches, such as machine learning, which are at the core of our contemporary understanding of AI.

**Data-driven approaches to AI**

Machine learning and other data-driven approaches to AI originated side by side with logic-based AI systems in the late 1950s. The focus in early machine learning was to develop self-learning machines that would improve their performance in given tasks based on data. In the early days of the field, these approaches were side-lined from mainstream AI research due to difficulties in acquiring sufficient data and computational power needed to train the models. However, this all changed in the 2010s with big data and datafication, a term popularised by Cukier and Mayer-Schönberger to describe the large-scale translation of our everyday lives into quantifiable data for producing predictive analytics (Cukier & Mayer-Schönberger, 2013).

With the expansion of data-driven AI techniques and their deployment across societies and sectors to predict and steer human behaviour, we have ended up with the current societal and legal concerns that will also shape the debates on AI regulation. As we describe in section 4, the EU’s AI Act hopes to regulate the design and use of such data-driven computational techniques and their social consequences which some scholars refer to as algorithmic forms of governance or as algorithmic regulation (Aneesh, 2009; Yeung & Lodge, 2019). In other words, the discussion on law and AI is fundamentally connected with broader issues of technological change in our societies and the role of law and regulation in shaping these developments.

2.2 Persistent issues of law and technology, or AI and law

The examples above illustrate the relevance of prior research for today’s debate on AI regulation. Despite the qualitative differences between rule-based and data-driven AI approaches, some concerns about AI have remained much the same despite significant changes in our societies and legal frameworks.

*AI effect*
Lessons learnt from earlier research are particularly relevant for our current discussion due to the phenomenon colloquially called ‘AI effect’, in which the term AI refers to technological functionalities not yet achieved but once successfully deployed they are no longer considered AI (McCorduck, 2004). Simply put, the definition of AI is a moving goalpost that changes over time (cf., Aneesh 2009; Gillespie 2014; Koulu 2021). This dynamic nature of the concept of AI imposes challenges for defining the scope of AI regulation. At the same time, there is interpretative flexibility to the concept, which may support the creation of regulation that lasts the test of time and is not rendered obsolete by any individual technological advances. Understanding the changing notions, plurality of approaches, and different iterations of AI helps the legally oriented reader to pinpoint those social and legal implications of AI development and deployment that require regulatory intervention.

In a history of AI, McCorduck contextualised the 20th century AI developments in relation to the long history of Western philosophical thought that has aimed to mechanise human thinking for centuries, if not millennia. A more recent milestone and commonly accepted starting point for AI as a scientific field is the Dartmouth Summer Research Project on Artificial Intelligence in 1956, organised by mathematician McCarthy to develop machines to simulate human intelligence, learning and problem solving (McCarthy, Minsky, Rochester & Shannon, 1955). The summer workshop established AI at the intersections of computer science and human intelligence. This positioning made clear the philosophical dimension inherent in the endeavour to simulate human intelligence by machines.

Philosophical dimension to simulating human intelligence

Despite changes in methods and techniques, the core understanding of AI has remained much the same: artificial intelligence aims to simulate human intelligence in a way that enables the replacement and/or augmentation of human cognitive tasks by computer processes. The early connection between the concept of AI and philosophy contribute to the definition dilemma. As the concept of AI is connected with the philosophical questions about the essence of cognition, intelligence and human behaviour that seems to indicate them, providing a clear-cut definition is not simply about capturing rapid changes in the technical methods and approaches. Also, in his
influential work on early AI applications called legal expert systems, Susskind recognised the metaphorical dimension of simulating human intelligence, finding the concept to be useful despite its limited philosophical rigour (Susskind, 1987). By defining AI through human cognition, the question of developing AI applications for law meets the philosophical difficulty of understanding the foundations of legal thinking.

*The concern for human values*

One of the long-lasting narratives is the concern for the loss of human values that results from technology-driven fate beyond human control. Although authors perceive its likelihood and meaning differently, the fact that these arguments are repeated over time suggests a complicated relationship between law and technology, in which law and legal values are challenged by technological developments. Loevinger (1949) disparaged such concerns for the essence of law as being based on a false understanding of science.

Law, technology, and society scholar Brownsword (2019, p. 9) summarised current scholarship by repeating similar concerns for legal values:

“The rise of technological management in place of traditional legal rules might give rise to several sets of concerns. Let me briefly sketch just four kinds of concern: first, that the technology cannot be trusted, possibly leading to catastrophic consequences, secondly, that the technology will diminish our autonomy and liberty; thirdly, that the technology will have difficulty in reflecting ethical management and, indeed, might compromise conditions for any kind of moral community; and, fourthly, that it is unclear how technological management will impact on the law and whether it will comport with its values.”

Many scholars have elaborated the negative consequences of datafication, quantification, and algorithmisation from a socio-legal perspective. Hildebrandt draws attention to the need for the protection of “what is uncountable, incalculable or incomputable about individual persons” (Hildebrandt, 2019, p. 83), Yeung emphasises the intergenerational harms and effects of algorithmisation, which law is poorly equipped to address (Yeung & Lodge, 2019). It would be reductive to assume law as only the receiving party of technological development, which needs to
react and adapt. Instead, the relationship between law and technology is of dynamic reciprocity, in which law shapes technological developments and is simultaneously shaped by them in continuous loops (Cohen, 2019; Koulu, 2020).

3 Review of recent legal research on AI and regulation

3.1 Prolific rise in amount of research

In the last section, we drew attention to the origins of law and AI research and discussed the shift in focus from AI applications for law into regulation of AI applications through law. This shift coincides with the prolific rise in research on legal implications of AI. In this section we present the results of a non-systematic literature review conducted from spring to autumn 2022 to assess the current trends in legal scholarship as to AI definitions and calls for regulatory intervention. Our final dataset included 71 articles based initially on two research database searches.5 We first narrowed down the refined dataset of 1.375 articles to a sample of 150 articles by additional keywords and then complemented the sample with purposive sampling based on our knowledge and expertise of the field to represent seminal literature, authors and journals missing from it.6 Based on abstracts, we selected 71 of the 150 articles for close reading, to find that a further 18 of the articles were irrelevant to the questions we posed.7

5 The initial search was concluded in March 2022 with key words "artificial intelligence" AND regulation in the HeinOnline and Web of Science databases (returning some 10,000 results). The search was limited to years 1990-2022 and only to refereed articles. Results included 1375 articles.
6 Terms used in search were: “regulating artificial intelligence”, "governing artificial intelligence", "legislating artificial intelligence", "AI Act", "artificial intelligence act", "AI policy" and “algorithm*”. To control for sample size, in the search we excluded the use of synonyms and close terms to AI and algorithms, such as intelligent systems, computer systems and automated or autonomous decision-making. Similarly, we did not use synonyms or close terms to regulation in the search to further limit the number of results. Due to the otherwise large number of hits, we decided to rely on these limited key words to present the current research at an informative level. Results were not specifically limited by publication years, but a considerable proportion of them had been published in the period 2018-2022. From the 150 articles, we selected 60 articles for further reading based on their abstracts.
7 In addition, we searched articles from HeinOnline’s Law Journal Library (terms "artificial intelligence" AND regulat* and “PathFinder Subject: Science, Technology, and the Law”) and based on this search, we complemented the sample gathered from Web of Science, choosing 11 articles written by well-known researchers.
The initial searches demonstrated a literature explosion over the past few years; law and AI is a rapidly developing field resistant to overall synthetisation. We reluctantly noted that our initial search result reflected a classical database problem, as put by AI & Law pioneer Susskind: database searches may “deliver excess of irrelevant documents and fail to produce the bulk of those relevant texts” (Susskind, 1987, p. 6), due to unsatisfactory criterion for relevance.

Our review was guided by three main questions: how was artificial intelligence defined in the prior legal literature; where do scholars locate AI-related problems that require new regulation; and has current research engaged with the AIA? Answers to these questions, together with the theoretical background provided in section 2, and the analysis of the EU’s AI Act proposal in section 4 will contextualise AI regulation and problems related to it. We decided not to conduct a literature review on law and AI based on established legal debates, fields and disciplines to avoid furthering disciplinary siloes and in order to follow the holistic horizontal approach that seems to inform many AI regulation initiatives (Yeung & Lodge, 2019).

3.2 Scholarship and definition of AI

As to defining AI, the foremost result of the literature review is that most often in our sample AI is not defined at all, and when it is, the definition is not clear-cut – no definition of AI in scholarship or policy document emerges as a shared point of reference. For example, Zuiderveen Borgesius, who argues for sector-specific further regulation, side-lines the definition of AI: “this paper sacrifices precision for readability, and uses, ‘algorithmic decision-making’, ‘AI’, etc., without specifying whether the phrases refer to machine learning or another technology”.

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8 For example, typing "artificial intelligence" AND regulat* on the search bar in HeinOnline’s Law Journal Library emphasised the recent increase in AI related research rather significantly, as the number of search results increased nearly tenfold between 2016 and 2022 compared to between 2010 and 2015. At this point, results were not limited to refereed articles and in general, this is just an indicative example from March 2022. However, the same rapid increase in search results in recent years was something we noted throughout our literature search.

9 Some focus on a narrower definition than AI, such as algorithm, e.g., “we define an algorithm as a mathematical formula implemented by technology: ‘a sequence of instructions that are carried out to transform the input to the output.’” (Alpaydin, 2016, p. 16, as cited in Oswald, Grace, Urwin & Barnes, 2018).

10 For Zuiderveen Borgesius (2020, p. 1573, quoting Dourish, 2016: 3), an algorithm is ‘an abstract, formalized description of a computational procedure’ and the ‘decision’ in algorithmic decision-making refers to the output of the computational procedure.
This signals to us that scholarly discussion on AI and law is possible without a distinct common definition of AI. Discussing various computational procedures bundled under reference to AI, scholarship devotes differing degrees of attention to various issues, such as presence of intelligence,\textsuperscript{11} data-driven approaches,\textsuperscript{12} and distinguishing between data-driven AI techniques and other computer programs.\textsuperscript{13} Practical examples of AI use include “home management systems integrated into household appliances; robots; autonomous cars; unmanned aerial vehicles” (Čerka, Grigienė & Sirbikytė, 2015, p 378). Some scholars refer directly to AI definitions adopted in various policy instruments.\textsuperscript{14} Others, like Ashraf (2022), engage in defining and distinguishing between narrow and general AI and explain narrow AI by using concepts like machine learning, deep learning, and reinforcement learning. Several sources mention and reflect on the difficulty of defining AI. Whereas Koulu (2020, p. 13) describes that “the concept of artificial intelligence (AI) is ambiguous at best”, Buiten (2019, p. 45) concludes that:

“[...] in sum, there does not appear to be a clear definition of AI. The various definitions of AI used in the literature may be helpful to understand AI, but are unsuitable as a basis for new laws. While some uncertainty may be inherent to new technologies, it is problematic to centre laws and policies around the opaque concept of AI.”

It seems that for scholars – as opposed to regulators – the key question in regulating AI is not to provide a comprehensive definition of AI. This approach can be considered problematic in

\textsuperscript{11} Zuiderveen Borgesius (2020, p. 1574) defines AI as “the study of the design of intelligent agents”, borrowing this computer science definition from Russell & Norvig (2016, 2) who in turn cite Poole, Mackworth, & Goebel, 1998, 1: “Computational Intelligence is the study of the design of intelligent agents”.

\textsuperscript{12} E.g., “AI techniques including machine learning and deep learning are involved” (Liu, Lin, Chen, 2019, p. 135); “AI in the forms of machine learning, voice recognition and predictive analysis”, where writers refer to “AI, in the forms of machine learning, voice recognition and predictive analysis” (Lui & Lamb 2018, p. 267); “The most important contemporary instantiation of artificial intelligence (AI) is machine learning” (Hacker, 2018 p. 1143); “[...] intelligent behaviours assist the AI to resolve issues at hand by providing a decision using reasoning derived from analysis of sample data which they have been fed” (Bishop, 2006, as cited in Lee, Karim & Ngui, 2021, p. 259).

\textsuperscript{13} “AI is different from conventional computer algorithms in that it is able to train itself on the basis of its accumulated experience” (Čerka, Grigienė & Sirbikytė, 2015, p 378). “The second wave of AI refers to computer systems that create their own rules” (Gacutan & Sel vadurai, 2020, p. 195). Public policy scholars Matus and Veale (2021, p. 177) describe how “Machine learning systems, often colloquially called ‘algorithms’ or even ‘artificial intelligence systems, are a type of software distinguished by the way that they ‘learn from experience’”). According to Hacker (2018, p. 1143), “The most important contemporary instantiation of artificial intelligence (AI) is machine learning”.

\textsuperscript{14} Wojtczak & Ksiezak (2021, p. 2) refer to the Independent High-Level Expert Group on Artificial Intelligence definition of AI; Svantesson (2021, p. 4) refers to AIA, Annex I definition of AI; Gacutan and Sel vadurai (2020, p. 215) refer to OECD’s definition of AI.
scholarship that seeks to discuss the formulation of AI regulation and its scope – especially as the definition is something the EU legislator seems to struggle with currently. In sum, the articles in our sample did not really help with the AI definition dilemma, but made it clear that this had not inhibited academic discussions.

3.3 Where scholars locate AI-related problems that require new regulation

We asked our sample where scholars locate AI-related problems that require new regulation. Many AI-related regulative problems came up, yet few scholars wrote from the de lege lata perspective, seeking to suggest a solution based on existing law (for example Hacker, 2016, examines the existing GDPR for means to fight algorithmic discrimination). More often, the perspective was one considering the question of how to regulate AI (de lege ferenda) by suggesting a need for new legislation. However, only 14 of the relevant 53 articles in our sample clearly argued for new regulation, whereas most articles more indirectly discussed or mentioned the need for legal protection.

Zuiderveen Borgesius (2020), for one, suggested a sector-specific rather than a general approach in giving additional regulation, to focus on other contexts affected by algorithmisation. Our sample did not include suggestions indigenous to scholarship on general horizontal regulation of AI. Instead, the regulative suggestions arose from AI-related problems in alternative contexts. One was liability and law’s anthropocentricity. Lee, Karim and Ngui (2021) argue that AI requires new regulation on liability, as current liability regulation based on anthropocentricity struggles with establishing causality in the AI context. They made this point on the challenge of focusing on individual persons in the context of liability, but it is also relevant in many other fields of law and can be generalised to one of the core problems in relation to the use of AI. Exerting human-centred concepts to machine action for liability can lead to a problematic practice of constructing a human scapegoat.

Tamo-Larrieux (2021) explored ‘unwanted side-effects’ of automated decision-making (ADM) and made another important general observation by pointing out how current data protection rules

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15 Beyond the AIA proposal, a list of AI definitions can be found in the Commission’s Joint Research Center’s publication (Samoili, Lopez Cobo, Delipetrev, Martinez-Plumed, Gomez Gutierrez & De Prato, 2021).
that touch upon ADM focus on individuals, not on groups or collectives. According to Tamo-Larrieux (2021), with regard to AI and ADM, social harms and collectives should be considered more. However, because existing law operates around individuals’ rights and obligations instead of other or larger entities, an approach covering wider audiences, groups and cumulated harm is much more difficult to put into action (on collectives, see also Smuha, 2021; Hakkarainen 2021). As other courses of action, such as non-discrimination law will have only limited success with this challenge, it calls for new regulation.

As to a proper regulative approach, questions of where control and power over AI use should lie were raised but scholars were not unanimous regarding these. For example, in the context of computational propaganda Dowdeswell and Goltz (2020, p. 211 [emphasis added]) propose that “power should be decentralized, and greater user control should be promoted”. In the data protection context, on the contrary, Hacker (2017, p. 285 [emphasis added]) argues that “EU data protection law suffers from an overreliance on control and rational choice that vulnerable users are unlikely to exert”. Studying platforms, De Gregorio (2018) brings up the possibility to give public power to platforms but expects the use of it to be regulated. Thus, the reasons for and solutions to how to regulate AI seem to vary. However, one must keep in mind that the disciplines and exact problems vary from one article to the next. Nevertheless, old questions in relation to power and its limits and control mechanisms remain relevant in relation to regulating AI.

When it comes to regulatory choices, the sample presented several different ways forward. While some were mapping areas where certain AI systems should not be used at all (Oswald et al, 2018), others suggested a more policy-oriented rather than regulatory reform (Dowdeswell & Goltz, 2020). That is, instead of making proposals for new legislation, the course of action suggested was for example “enhance media literacy” (Dowdeswell, & Goltz, 2020, p. 211). In the context of computational propaganda, Dowdeswell and Goltz (2020, p. 211) suggest:

“three organizing principles that can be used to direct regulatory responses to computational propaganda: 1) there should be informational transparency, including for algorithms and information flows; 2) power should be decentralized, and greater user control should be promoted; and 3) there should be a focus on efforts to improve media literacy, fact-checking and credibility. These principles are all linked, and together we
propose that they are better able to deal with some of the specific harms of computational propaganda while also promoting democratic values, human rights, and civic engagement.”

Our sample extending to 2022 included very few articles discussing the AIA specifically. Public policy scholars Matus and Veale (2021) advocate for certification of machine learning systems as a form of private AI governance. They note that the AIA “proposes a certification scheme inspired by and connected to conformity assessment regimes for (primarily) product safety” (Matus & Veale, 2021, p. 192). In this sense, the AIA follows the same idea of certification, though it does not leave the choice to regulate or not for industry self-regulation like Matus and Veale do. Moreover, the suggestions by Buiten (2019) in the context of algorithmic transparency to focus attention on a range of aspects of algorithms (training data, testing the algorithm and the decision model chosen) instead of AI seem to align with the approach of the AIA, although the AIA proposal is not mentioned in the article. Articles that discussed AIA did it mostly in comparative contexts. They assessed the extraterritorial impact of AIA; whether or not their jurisdiction (Australia, US, China) should also regulate AI; and whether or not they should do it similarly as the EU is doing with AIA (Gacutan & Selvadurai, 2020; Svantesson, 2022). The reason for limited results regarding articles on AIA may be due to timing. We expect to see more AIA specific publications in the near future. Even though the AIA is still only an advanced legislative proposal, we next assess it in order to illustrate what the precise problems AIA aims to address are, and how these relate to the literature.

Our literature review suggests neither a scholarly consensus on which AI related concerns require regulation, nor a specific way to regulate AI, if considered necessary. We did not find a united front of scholars arguing for the EU adopting horizontal regulation such as the AIA proposal but did find some individual articles the suggestions which align with some central AIA ideas.

4 Attempts at regulation: the EU’s AI Act Proposal

As we hope to demonstrate throughout this chapter, when opting to regulate AI systems horizontally, finding reasonable definitions for the target ‘AI’ and ‘system’ become a core challenge. This defines the scope of application of the said horizontal legislation and should
provide legal certainty. What AI is considered to be should at the same time be precise and general enough to capture the complex and diverse applications and do justice to the multitude of various technological approaches. The importance of technological neutrality as a regulatory technique is acknowledged and considered vital for “future-proofing” legislation. The AI Act proposal strives for a balance between technological neutrality and specificity through its regulatory architecture, where AI is defined in broad terms as software developed according to certain techniques and approaches, which are then listed and updated in one of the annexes. However, above we demonstrated how scholarship has neither needed nor suggested such a definition, and next we question whether it is central for the AIA either.

For reasons explained in more detail above and below, regulating artificial intelligence (AI) has become a pressing policy question within the European Union (on policy development, see Ulnicane, 2022). In April 2021, the EU commission introduced its proposal for AI regulation, following the political guidelines established by Commission President Ursula von der Leyen in 2019. Regulation on AI has been on the EU’s Digital Single Market agenda since 2017, when the European Council called for urgent action to ensure data protection, digital rights and ethical standards. If the Council and the European Parliament agree on the text of the AIA and it is consequently enacted, the Regulation would become applicable law in all EU Member States.

The AIA is an ambitious legislative proposal. It builds on horizontal rather than sectoral regulation of AI. It contains mandatory requirements for the design and development of AI systems and harmonises controls for these products on the internal market. At the time of writing this chapter, adapting various aspects of the AIA proposal was ongoing (for more, see Bertuzzi, 2022) after its introduction almost two years earlier. Several amendments to and compromise proposals on the AIA have been published, but the fate of the AIA has not yet been decided on by the EU’s co-legislators.

16 European Commission, 2021b.
17 European Council meeting 19 October 2017, conclusions (EUCO 14/17).
18 The Slovenian presidency (2021) made a partial compromise proposal, then the French presidency (2022) and, at the time of writing this, the Czech presidency (2022) released theirs (see, respectively each Council of the European Union Presidency compromise text to the AIA proposal: Council of the European Union, 2021, 2022a, 2022b).
4.1 The three-pronged approach of forbidden, high-risk and low or minimal risk AI systems

The AIA’s chosen legislative strategy builds on a risk-based approach similar to that of the General Data Protection Regulation (679/2016) but departs, first, from its legal basis in the Treaty on the Functioning of the European Union (TFEU) and, second, from its blanket regulation approach, in which all data processing activities are subjected to the same requirements. Whereas the legal basis for GDPR is Art. 16 TFEU on protecting personal data, the AIA’s legal basis is in part Art. 16 TFEU but mainly Art. 114 TFEU on a functioning internal market. Different legal bases suggest different main purposes of legislation. Both instruments are part of the Commission’s Digital Single Market package, but unlike the GDPR, the AIA approach largely follows that of existing EU product safety and market surveillance legislation (including ‘new legislative framework’, NLF). Instead of blanket regulation, the AIA proposal establishes obligations depending on categorisation of the risk level of the AI system at hand: it differentiates between AI uses that create either unacceptable risk, high risk, and low or minimal risk. Certain manipulative AI uses are entirely prohibited as unacceptable risk, whereas high-risk applications (products) need to comply with new mandatory requirements on documentation, transparency, and human oversight, before they are permitted on the internal market. In contrast, low-risk AI applications that fall outside these obligations can follow voluntary codes of conduct (i.e., industry self-regulation).

However, as to its scope of application, this is a blanket proposal, as it covers all AI systems and is arguably an instrument of maximum harmonisation (Veale & Zuiderveen Borgesius, 2021), that just does not set specific requirements for low or minimal risk AI systems. On one hand, should maximum harmonisation be at hand here, the Member States can no longer regulate any class of AI systems. On the other, should the AIA not maximum harmonise, it would not maximally prevent market fragmentation (especially in low and minimal risk AI systems). This is the general

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19 NLF is the EU’s internal market approach to ensuring conformity of products with applicable EU legislation when placed on the EU market, in effect the approach was rebranded in 2008, previously known as new approach since the 1980s.
20 European Commission, 2021b.
21 The AI Act (COM/2021/206. Art. 1) “lays down: harmonised rules for the placing on the market, the putting into service and the use of artificial intelligence systems (‘AI systems’) in the Union”.

aspect of the scope of application of the AIA: which emerging technology or machine-based systems fall within its scope and who has the power to regulate them or not?

A specific aspect of the AIA’s scope of application is the risk-based classification internal to the AIA. Many of the high-risk applications concern uses of public, democratic or political importance, such as critical infrastructure, education, public services, law enforcement, and administration of justice. In other words, the proposal touches upon key areas of public life where AI systems are in use already. In practice, determining the scope of application of the AIA proposal – which rules apply, product by product – can be problematic not just for the difficulties related to defining what AI is, but also for deciding which AI systems should be considered high-risk or not.

4.2 AIA objectives: protecting fundamental rights and facilitating investment, innovation and development on the Single Market

For an instrument that states in its name it is “laying down harmonised rules on artificial intelligence”, the AIA proposal does not directly seek to address many of the problems the literature has addressed as having been caused or exacerbated by the increasing use of algorithms or AI. The approach is more indirect: regulating the development, marketing and use of AI: it is largely directed at the designers and manufacturers of non-forbidden types of AI systems. The goal seems to be to encourage addressing risks at source. This means that the effects and especially unwanted effects on society and legally protected rights would already be considered at the stage of developing technology (the “by design” ideology).

With the AIA, the Commission essentially seeks to set standards for AI use within the European Union and to an extent, the world. The explanatory memorandum of the AIA proposal explicitly identifies four objectives:

- ensure that AI systems placed on the Union market and used are safe and respect existing law on fundamental rights and Union values;

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22 European Commission, 2021b, Annex III.
23 On ‘the Brussels effect’, i.e., EU regulation’s extraterritorial effects outside the EU though its regulation is not unilaterally directed to third countries, see Bradford (2020).
- ensure legal certainty to facilitate investment and innovation in AI;
- enhance governance and effective enforcement of existing law on fundamental rights and safety requirements applicable to AI systems;
- facilitate the development of a single market for lawful, safe and trustworthy AI applications and prevent market fragmentation.\textsuperscript{24}

The objectives of the AIA proposal emphasise both competitiveness of the internal market and European values (i.e., fundamental rights and freedoms) in design and use of AI systems. Similarly with the General Data Protection Regulation (GDPR), the AIA aims to further rights protection and prompt worldwide standards and entails the possibility to pose fines for non-compliance.\textsuperscript{25} Specifically on protecting fundamental rights, the AIA proposal’s explanatory memorandum states that it “aims to address various sources of risks through a clearly defined risk-based approach (European Commission, 2021b, p. 11)”. The means to this end listed in AIA’s preamble is market regulation: to improve the functioning of the internal market; pursue a number of overriding reasons of public interest (protection of health, safety and fundamental rights); and ensure free movement of AI-based goods and services cross-border (European Commission, 2021b). The means chosen to follow from the logic and tradition of AIA’s chosen legal basis (Art. 114 TFEU), i.e., EU’s legislative competence – instead of purely societal needs, historical experience or academic research.

Many of the human or fundamental rights protecting elements of the AIA proposal may concern its justification more than content, bordering on window-dressing and emitting a false sense of tangible rights protection (lacking an individual complaint mechanism). However, if considered as a means to that end, it nevertheless will protect public interest directly by forbidding certain AI systems and indirectly by regulating the development, marketing and use of AI. By comparison, the AIA’s legally binding prohibitions (compared to many other approaches around the globe, see Geist, 2021, it explicitly bans certain AI systems) and requirements (for high-risk AI systems) are certainly a stronger form of protecting fundamental rights than non-binding ethics guidelines and

\textsuperscript{24} European Commission, 2021b, p 3.
\textsuperscript{25} European Commission, 2021b, Arts 71-72.
policy recommendations on AI. The effectiveness of this protection hinges on the effective enforcement of the AIA which, in turn, may turn out to be problematic.

Considering the aim of protecting fundamental rights, the regulative architecture based mainly on industry self-assessment against harmonised standards and common specifications (NLF) while lacking any direct complaint or redress mechanisms for individuals may seem odd (for further criticism, see Smuha, 2021; Smuha et al, 2021; Veale & Zuiderveen Borgesius, 2021). However, viewing the AIA as a piece of EU product safety and market surveillance legislation, it is less peculiar.

The NLF regulatory approach builds on increasing compliance with requirements, such as existing law, through industry standards that are mandatory, or not. In a similar way, corporate social responsibility, sustainability and areas of environmental law operate with more or less voluntary standards and certificates intended to increase compliance (see e.g., Matus & Veale, 2021; Smuha, 2021). In this sense, considering that the AIA proposal regulates the development, marketing and use of AI – which in turn is intended to ensure that AI systems are safe and lawful – NLF as an approach may fit. The AIA cannot protect the world from harm caused by AI, but it can go some way to increase compliance with existing law. However, the Commission developed required harmonised standards or common specifications as well as industry developed voluntary codes of conduct mainly do not yet exist (see Mc Fadden, Jones, Taylor & Osborn, 2021; Veale & Zuiderveen Borgesius, 2021), and effectively legislating through private standards setting bodies or industry self-regulation suffers from democratic deficit (see e.g., Cantero Gamito & Micklitz, 2020; Van Gestel & Micklitz, 2013).

Several further points of criticism remain. First, the relative ineffectiveness of the earlier new approach or NLF to protect the internal market from non-compliant products is well-established.  

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26 See High-Level Expert Group (HLEG) on AI, 2019b, 2019c.  
27 European Commission, 2021b.  
28 The proportion of non-compliant products has varied between 5-53% of products in different market segments, according to Commission impact assessment inception document on the initiative ‘Internal Market for Goods – Enforcement and Compliance’, 13 May 2016, based on several inspections and studies cited, see European Commission (2017).
and has not escaped the Commission. Second, the adverse societal effects (on human rights, democracy, rule of law) of developing, marketing and using AI systems are difficult to conceptualise: hence such harm is hard to pinpoint or quantify, and address, which has been criticised by legal scholarship (Smuha, 2021). This dissonance has not escaped the legislator either. Risk for the AIA relates only to classifying the object of regulation (risky AI systems) and harm relates only to individual or collective harm. Moreover, the AIA does not allocate responsibility for more than individual harm (Smuha, 2021). Resolving these problems is not listed in the AIA proposal as its objectives.

To conclude, the AIA proposal seems to provide an example of what Bennett Moses described as technology being used as justification for new regulation, where the mixed rationales for regulating (market failure, rights protection, social solidarity and democratic governance) have little or nothing to do with technology (Bennett Moses, 2016). To a large extent, the AIA seeks to enhance enforcement by requiring existing law also to be observed in the context of AI development and deployment. To an extent, the definition of AI and harmonised or industry standards share a challenge: they may require constant change as technology develops.

4.3 Solving the AI definition dilemma in AIA?

The definition of AI systems in the AIA proposal has undergone several rounds of changes that are visible in the Czech Council Presidency’s compromise text. The AIA proposal definition of an AI system differs from those presented in the legal literature (see above) as well as from the updated definition of AI systems provided by the EU’s High Level Expert Group on AI set up by the Commission. Much ink has been spilled producing newspaper and scholarly articles debating
the definition dilemma. Among others, we suggested above that pinning down a clear definition of AI or AI system is necessary in order to decide the scope of application, which in turn secures more adequate enforcement. However, we also suggest that the definition dilemma can be approached as a false dilemma. First, and in general, the law has more and less successfully dealt with vague definitions before. The law will manage, and clarity will increase via interpretation of the law. With the AIA particularly, once it passes, the regulative design may still include giving the Commission the power to amend the technical definition of AI system via implementing acts, considering market and technological development (Council of the European Union, 2022b, Art. 4). Hence the AIA would include a general more permanent definition as well as a more technologically precise and more easily adaptable implementing acts defining AI systems.

Second, and more specifically, it may not matter all that much what the exact definition of AI or AI system is, if the main purpose of the AIA is understood as AI systems complying with existing law and additionally with some requirements as to making notes while developing a system and complying with product standards. To decide whether an AI system is prohibited, high-risk or not (hence determining the applicability of the AIA and regulative authority), even our own definition of AI for this chapter might suffice: “We perceive AI as a diverse set of different computational procedures or techniques (such as machine learning algorithms) that based on data perform tasks to varying degree of autonomy that would be considered intelligent if performed by humans.” What really matters, also for the AIA, is the use of that technology – for good or for bad – as the recent ChatGPT fueled discussion points out (Helberger & Diakopoulos, 2023).

5 Conclusions

Above we have provided the reader with first, an overview of the historical and current developments in research on law and AI and second, described how the upcoming EU AIA intends to bring the design and use of AI systems under a harmonised legal framework. With our literature review, we drew attention to the growing scholarly interest in AI and law as well as the limitations of database searches in gaining understanding of the field. Notions of AI have changed over time,
the focus of legal research has shifted, and current research reflects a broad understanding of AI as computational procedures and techniques.

In a context in which the main goal of new legislation is to increase compliance with existing law without hindering innovation or competitiveness, the vagueness of central concepts such as AI and AI systems – the definition dilemma – is perhaps not a welcome discovery for all. However, for law, it is not necessarily a problem in need of a solution either. Historically, law is well equipped to work with vague concepts, even in the context of law and AI.

In terms of research, instead of focusing on the definition dilemma, present AI and law research might benefit from a stronger focus on the social and legal contexts in which computational techniques are embedded. The legislator will provide a definition for AI systems. Regardless of the content of that definition, the law will provide mechanisms to guide how computational techniques can be exploited and instructions on developing AI. Empirical legal research is required to analyse how well regulating AI systems works in action, in the interaction between law, technology, and society.

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