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Introduction to the *Handbook on the Politics and Governance of Big Data and Artificial Intelligence*

Andrej Zwitter and Oskar J. Gstrein

THE OMNIPRESENCE OF BIG DATA AND ARTIFICIAL INTELLIGENCE

Big Data and Artificial Intelligence (AI) have pervaded all aspects of modern life. For decades, popular culture and science fiction literature have frequently featured autonomous systems, robots, algorithms and other manifestations—or imaginations—of what data-driven lives could look like. Asimov’s three laws of robotics or Philip K. Dick’s question whether androids dream of electric sheep have inspired not only Hollywood but scientific research too. With the turn to the new millennium, Big Data infrastructures and methods using some form of machine learning gained permanent foothold in scientific debates across all disciplines.¹ They reshape the way scientific success is measured, established and communicated. In a similar manner, politics and governance are heavily influenced and shaped by Big Data and AI. The control over Big Data infrastructures and the ‘possession’ of the most advanced AI—in whichever form available—is a strategic priority for political leaders in the East and the West.² At the same time, leaders in the global south and less wealthy countries of the world fear being dominated by those who master the new technologies. In those countries able to afford it, the application of techniques related to the collection, cleaning and analysis of Big Data and its further processing through different algorithmic models (broadly labelled AI) can be found in many domains of the administrative and

¹ Viktor Mayer-Schönberger and Kenneth Cukier, *Big Data: A Revolution That Will Transform How We Live, Work, and Think* (Houghton Mifflin Harcourt 2013); Andrej Zwitter, ‘Big Data Ethics’ (2014) 1 *Big Data & Society* 205395171455925.

² Cecilia Rikap and Bengt-Åke Lundvall, *The Digital Innovation Race: Conceptualizing the Emerging New World Order* (Springer International Publishing 2021) <<https://link.springer.com/10.1007/978-3-030-89443-6>> accessed 24 August 2022.

security sector.³ We find it in health, education, tourism, law enforcement, cybercrime, as well as the military.

This opens rich business opportunities for those private companies able to swiftly provide and deploy technology at scale. As such, Big Data infrastructures and the AI systems leveraging their potential emerged into a new form of general-purpose technology. Similar to inventions such as the steam engine or the internal combustion engine, they fundamentally transform the way in which we approach and shape politics, governance and societal interaction more broadly. This new sort of general-purpose technology has quickly become an indispensable aspect of knowledge generation and efficiency. When discussing the effects of AI and Big Data on society, one is too easily tempted to understand the terms themselves not as metaphors or broad themes, but as denoting actual processes. Looking at these technologies through the perspective of Data Science allows digging deeper into the toolbox and investigating the dynamics between the technical aspects, societal dynamics and governance implications of Big Data and AI.

Taking the term ‘artificial intelligence’ as an example, popular science debates abound with notions of the self-aware AI, malicious killer robots, and ‘the singularity’ where machines can form an independent and self-sustaining ‘civilization’ that will bring an end to all humanity—or at least to the relevance of humanity as ‘the rulers’ of the world as we know it. Such simplified stories are the result of taking the terms too literally. The metaphorical use of the term ‘intelligence’ could be interpreted as some sort of autonomous self-aware agency. In truth, the term ‘intelligence’ is a misnomer describing the algorithmic (i.e. mathematical) process of coming from data to certain conclusions in a logical sense, which are in themselves not to be confused with decisions or intent. There is nothing intelligent in the sense of autonomous agency taking place, nor is there a will, self-reflection or consciousness. Hence, taking these metaphors too literally has often led to serious academic and policy debates on the rights of AI—or robo-rights—which are falsely understood as being equivalent to human rights.⁴ A sound understanding of the underlying principles of the technology is a precondition for a fruitful debate in political science, law and governance, lest one run the risk of adopting conclusions based on metaphors that might not actually represent reality.⁵

³ ‘Automating Society Report 2020’ (*Automating Society Report 2020*) <<https://automatingsociety.algorithmwatch.org>> accessed 24 August 2022.

⁴ See Chapter 14, this volume, Gellers and Gunkel.

⁵ Zoë Corbyn, ‘Microsoft’s Kate Crawford: “AI Is Neither Artificial nor Intelligent”’ *The Observer* (6 June 2021) <<https://www.theguardian.com/>

When we refer to Big Data and AI, it is worthwhile to note that these terms, while not being metaphors, are still placeholders for a wide variety of techniques for data collection, processing and analysis. The exact definition and meaning of either of the terms is still subject to debate, which is somewhat surprising given their broad application and rapid implementation.⁶ While it is essential for any normative and regulatory treatment of the subject matter to have a firm grasp of the underlying ideas in order to avoid a metaphorical or superficial treatment of the subject, it is of little use to the non-technical reader to introduce fundamental techniques such as pattern recognition, data mining, natural language processing and Bayesian estimation in detail. What is important to consider, though, is that different sectors make use of slightly different techniques and different datasets—or a combination of these—to achieve objectives. Whether these objectives are always commonly or well understood seems one of the aspects where the design and engineering of the technologies frequently clash with ‘real-life’ needs. But in essence, there are common societal properties that lend themselves to a more generic treatment from the perspective of politics and governance, which is central to this handbook. One concrete example is the networked nature of Big Data and AI, which paves the way towards power shifts.⁷ This and similar general themes (or properties) relate to all important sectors of social life, such as education, health, security and warfare, humanitarian aid, as well as other industry and government activities, many of which are covered in the chapters of this volume. There are also more principled issues that require reconsideration, such as the impact of Big Data and AI on social justice (especially in transitional and economic settings), how AI and Big Data relate to or shape the perception and expression of gender, the profiling of users online, as well as how the design of security applications should evolve taking the availability of these emerging technologies into account. Finally, to gain a more comprehensive understanding, we can also pivot and ask ourselves what society does to these technologies themselves.

technology/2021/jun/06/microsofts-kate-crawford-ai-is-neither-artificial-nor-intelligent> accessed 24 August 2022.

⁶ Anne Beaulieu and Sabina Leonelli, *Data and Society: A Critical Introduction* (SAGE Publications Ltd 2022); Tom Taulli, *Artificial Intelligence Basics: A Non-Technical Introduction* (2019) <https://link.springer.com/epdf/10.1007/978-1-4842-5028-0_1> accessed 24 August 2022.

⁷ Zwitter (n 1); Andrej Zwitter and Jilles Hazenberg, ‘Decentralized Network Governance: Blockchain Technology and the Future of Regulation’ (2020) 3 *Frontiers in Blockchain* <<https://www.frontiersin.org/articles/10.3389/fbloc.2020.00012/full>> accessed 13 May 2020.

Some might argue that there should be a separate category of rights for AI and autonomous systems, that liability of autonomous systems needs careful consideration,⁸ and that AI in the context where it could ‘kill’ humans autonomously requires meaningful human control.⁹

PURPOSE AND AIM OF THE HANDBOOK

The purpose of the present handbook is to highlight the mutual effects of Big Data and AI on society. The contributions focus on governance aspects, political implications, the impact of Big Data and AI on international relations, as well as emerging initiatives for legal regulation. When it comes to the last in the list, particularly initiatives on the level of the United Nations (UN) are covered, as well as ongoing developments in regional organizations such as the European Union (EU, e.g. the currently discussed proposal for an AI Act).¹⁰ Where it makes sense and has a broader relevance for the subject also, perspectives from specific nation states are the point of departure of the analysis and discussion in the individual contributions.

The present handbook aims to consolidate the current state of the debate on the political role, the policy implications, and the regulation and governance of Big Data and AI as its main method of value extraction and knowledge generation. To attempt to map a topic as revolutionary to modern economy, industry and society as Big Data and AI in one single handbook is quite a challenge, one that is bound to result in an incomplete coverage and necessary omissions of concepts and debates. At the same time, it is a great opportunity to gather experts in the field of politics and governance of Big Data and AI, a field that has gained immense traction since the 2010s, producing a very substantial body of literature in a relatively short period of time. As a result, the present handbook cannot be more than the beginning of a consolidation process that is very necessary for identifying the key debates and core theories that guide this field. Such topics include, but are not limited to, AI in warfare, AI as liable actor in law and the quantified human being. While certainly interesting, it would have exceeded the bounds of this volume to include emergent debates in sufficient detail to do them justice, matters

⁸ See Chapter 15, this volume, Vellinga.

⁹ See Chapter 16, this volume, Blauth.

¹⁰ ‘A European Approach to Artificial Intelligence | Shaping Europe’s Digital Future’ <<https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>> accessed 24 August 2022.

such as digital identity,¹¹ data ownership, the normative function of data infrastructures,¹² blockchain governance and AI as moral agents. Nevertheless, we wish to flag that a holistic consideration of the emergence of these technologies is desirable, since their effects on society seem interrelated and partially co-dependent.

CONTEXT, CONSEQUENCES AND IMPACT

With the emergence of AI as general-purpose technology comes a variety of consequences. For example, a direct effect of the societal transformation that happens through the adoption of AI can be witnessed on the job market, where recruitment practices change, and job candidates increasingly face automated sorting, profiling and selection mechanisms.¹³ At the same time, the replacement of skilled labour through the automation of processes (sometimes also called ‘de-skilling’) can be witnessed, and a strong tendency towards more comprehensive surveillance at work manifests.¹⁴ Unfortunately, it seems that the trend towards more work from home and similar measures to prohibit the spread of SARS-CoV-2, its variants and other pandemics in the future will only further exacerbate such developments.¹⁵ But other recent crises also can be understood through the lens of Big Data and AI. The utility of AI in cybercrime is increasing and causes an arms race between criminals and IT security

¹¹ Andrej J Zwitter, Oskar J Gstrein and Evan Yap, ‘Digital Identity and the Blockchain: Universal Identity Management and the Concept of the “Self-Sovereign” Individual’ (2020) 3 *Frontiers in Blockchain* <<https://www.frontiersin.org/articles/10.3389/fbloc.2020.00026/full>> accessed 11 November 2020.

¹² Andrej Zwitter and Jilles Hazenberg, ‘Cyberspace, Blockchain, Governance: How Technology Implies Normative Power and Regulation’ in Benedetta Cappiello and Gherardo Carullo (eds), *Blockchain, Law and Governance* (Springer International Publishing 2020).

¹³ ‘Auditors Are Testing Hiring Algorithms for Bias, but There’s No Easy Fix’ (*MIT Technology Review*) <<https://www.technologyreview.com/2021/02/11/1017955/auditors-testing-ai-hiring-algorithms-bias-big-questions-remain/>> accessed 24 August 2022.

¹⁴ Jeremias Adams-Prassl, ‘Regulating Algorithms at Work: Lessons for a “European Approach to Artificial Intelligence”’ (2022) 13 *European Labour Law Journal* 30.

¹⁵ Oskar J Gstrein, Dimitry V Kochenov and Andrej Zwitter, ‘A Terrible Great Idea? COVID-19 “Vaccination Passports” in the Spotlight’ [2021] *Centre on Migration, Policy and Society Working Papers* 28.

service providers as well as amongst states.¹⁶ For example, the emergence of toolkits such as GPT-3 and DALL-E 2 by OpenAI has sparked concerns about the potential for malicious (ab)use.¹⁷ Luckily, most deepfake videos featuring politicians or public figures were created by comedians, or geeks experimenting with the technology. However, the fake videocalls in June 2022 of a system that presented itself as the mayor of the Ukrainian capital Kiev—Vitali Klitschko—with his respective ‘real’ counterparts in the cities of Berlin, Madrid and Vienna demonstrate the potentially severe impact of use of such and similar toolkits with malicious intent. It remains unclear who exactly the persons and motives behind setting up these fake video encounters were and which combinations of technologies they exactly used. It also seems unlikely that sustainable harms emerged from the attempt to mislead the mayors and their administrations. Nevertheless, the negative potential of such an application of the technology is very clear by now.¹⁸

Such debates on the emerging risks of Big Data and AI add to the more established debate on the risks of misinformation and ‘Big Nudging’, as well as the risk of political manipulation based on psychometric analysis and auto-generated targeted based on individuals’ psychological profiles. While the early days of data-driven businesses such as Facebook were characterized by the ‘data is the new oil’ paradigm (originally moulded by British mathematician Clive Humby in 2006),¹⁹ the end of the previous decade saw Zuckerberg’s data empire under heavy pressure stemming from the political and legal aftermath of the Cambridge Analytica scandal (covert illegal profiling/surveillance of parts of the US electorate through a private company with access to Facebook, yet knowingly neglected by

¹⁶ Andrej Zwitter, ‘The Artificial Intelligence Arms Race’ (*Policy Forum*, 27 July 2017) <<https://www.policyforum.net/artificial-intelligence-arms-race/>> accessed 3 September 2017.

¹⁷ Tais Fernanda Blauth, Oskar Josef Gstrein and Andrej Zwitter, ‘Artificial Intelligence Crime: An Overview of Malicious Use and Abuse of AI’ (2022) 10 IEEE Access 77110.

¹⁸ Philip Oltermann, ‘European Politicians Duped into Deepfake Video Calls with Mayor of Kyiv’ *The Guardian* (25 June 2022) <<https://www.theguardian.com/world/2022/jun/25/european-leaders-deepfake-video-calls-mayor-of-kyiv-vitali-klitschko>> accessed 24 August 2022.

¹⁹ Charles Arthur, ‘Tech Giants May Be Huge, but Nothing Matches Big Data’ *The Guardian* (23 August 2013) <<http://www.theguardian.com/technology/2013/aug/23/tech-giants-data>> accessed 25 January 2022; The Economist, ‘The World’s Most Valuable Resource Is No Longer Oil, but Data’ [2017] *The Economist* <<https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>> accessed 10 December 2019.

Facebook's leadership),²⁰ which first became public on 17 March 2018.²¹ While formal investigations and a \$5 billion fine levied against Facebook by the US Federal Trade Commission followed in 2019,²² the unleashed rage of the 'post-truth politics' movements ultimately culminated in an insurrection at the US Capitol on 6 January 2021. The role of social media – including Meta Platforms/Facebook – is still debated at the time of writing of this text in 2022.²³ Regardless, these developments would have been impossible without Big Data infrastructures and AI technologies.

Another important aspect that should be mentioned is the datafication of society, which these general-purpose technologies support.²⁴ Datafication is a concept that currently emerges in the social sciences (e.g. Science and Technology Studies) and that goes beyond traditional concepts (e.g. 'digitalization') that describe the critical role of data in society and politics. Datafication captures the turning of objects and processes into data, while also considering the role of the associated data community and the care that is put into data, as well as data-related infrastructural capacities.²⁵ Much attention has recently been paid to reconsidering how privacy as a proxy for individual autonomy transforms in the light of datafication.²⁶ On the one hand, privacy is still needed as a right that protects individual autonomy and the potential of societies to develop freely.²⁷ This is only possible with clearly stipulated rights and obligations for companies and public institutions.²⁸ On the

²⁰ Ryan Mac and Cecilia Kang, 'Whistle-Blower Says Facebook "Chooses Profits Over Safety"' *The New York Times* (3 October 2021) <<https://www.nytimes.com/2021/10/03/technology/whistle-blower-facebook-frances-haugen.html>> accessed 26 January 2022.

²¹ Margaret Hu, 'Cambridge Analytica's Black Box' (2020) 7 *Big Data & Society* 2053951720938091, 1.

²² *ibid* 3.

²³ Greyson K Young, 'How Much Is Too Much: The Difficulties of Social Media Content Moderation' (2022) 31 *Information & Communications Technology Law* 1, 1–5.

²⁴ Ulises A Mejias and Nick Couldry, 'Datafication' (2019) 8 *Internet Policy Review* <<https://policyreview.info/concepts/datafication>> accessed 24 August 2022.

²⁵ Beaulieu and Leonelli (n 6) 6–10.

²⁶ For an overview see Oskar J Gstrein and Anne Beaulieu, 'How to Protect Privacy in a Datafied Society? A Presentation of Multiple Legal and Conceptual Approaches' (2022) 35 *Philosophy & Technology* 3.

²⁷ Luciano Floridi, 'On Human Dignity as a Foundation for the Right to Privacy' (2016) 29 *Philosophy & Technology* 307, 311–312.

²⁸ See e.g. Gloria González Fuster, 'The Right to the Protection of Personal Data and EU Law' in Gloria González Fuster (ed), *The Emergence of Personal*

other hand, the increasing use of data-driven infrastructures, products and services comes with benefits and opportunities that are sometimes too easily taken for granted in the 2020s, as they will inevitably become more restricted with the limitation of (international) data flows and information sharing.²⁹ In light of all of this, it does not come as a surprise that regional regulators such as the EU increasingly pay attention to the various emerging problems and respond with legal regulations such as the 2016 EU General Data Protection Regulation, the draft EU-AI Act, and similar initiatives such as constantly updated cybercrime policies, the Digital Services Act and the Digital Markets Act.³⁰ These regulations and policies, which we see in similar fashion established in many parts of the world,³¹ in turn have effects on the potential use of data and AI applications and the safeguards commercial and governmental actors must observe.

In an attempt to point more specifically to the problematic issues and potential harms that Big Data and AI directly or indirectly bring about, a variety of problems emerges, such as:

- biases embedded in algorithms and the calibration of AI systems, which are the result of a narrow training data sample of oversimplified consideration of the underlying societal reality;
- reproducing societal inequality and manifesting its effects further by replacing analogue mechanisms to ‘discipline and punish’ with fully automated and autonomous means;³²
- eliminating unmonitored spaces online or offline, where new types of personalities and lifestyles can be explored—this is a particular

Data Protection as a Fundamental Right of the EU (Springer International Publishing 2014) <https://doi.org/10.1007/978-3-319-05023-2_7>.

²⁹ Oskar Josef Gstrein and Andrej Janko Zwitter, ‘Extraterritorial Application of the GDPR: Promoting European Values or Power?’ (2021) 10 *Internet Policy Review* 20–22 <<https://policyreview.info/articles/analysis/extraterritorial-application-gdpr-promoting-european-values-or-power>> accessed 26 January 2022.

³⁰ ‘A Europe Fit for the Digital Age’ (*European Commission – European Commission*) <https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en> accessed 24 August 2022.

³¹ Graham Greenleaf, ‘Now 157 Countries: Twelve Data Privacy Laws in 2021/22’ (Social Science Research Network 2022) SSRN Scholarly Paper 4137418 <<https://papers.ssrn.com/abstract=4137418>> accessed 24 August 2022; ‘Zhōnghuá Mundus | A Regulatory Iron Fist for Chinese Big Tech’ <<https://mailchi.mp/92448ff21d57/bruegel-china-newsletter-november-2021>> accessed 24 August 2022.

³² Michel Foucault, *Discipline & Punish: The Birth of the Prison* (Vintage 1995).

problem for minorities, special groups and people who identify with gender types that are not accepted by mainstream society;

- black boxes of AI systems that are the result of a cybernetic approach to information management purely focused on input signals and output results, and therefore disregard the importance of the process through which the final output was produced—this problem was prominently discussed in the case of using AI to assessing recidivism probabilities in parole judgements in the COMPAS system in some states in the United States;³³
- dehumanizing effects of the use of algorithms to manage human affairs (see the use of algorithmic decision-making in medical triage,³⁴ or the use of digital twinning of social structures);³⁵
- removal of human agency by automatised decision-making, such as in automated target detection of drones and killer robots in AI assisted warfare;³⁶
- problems for decision-making that are the result of a lack of awareness or a lack of considering the dynamics of fruitful human-machine interaction;
- incursions into the private sphere through invasive data collection practices such as data scraping from the web, strategic de-anonymization through linking databases and other data practices of software and hardware providers (see Facebook, Angry Birds);³⁷
- inability of the technology to perform in unstructured or unforeseen environments due to a lack of flexibility or a misconception of social realities and contexts.

While this is an extensive list, it is certainly not comprehensive. For example, new data practices in humanitarian action and development aid showed how demographic groups could be just as vulnerable as

³³ Julia Angwin and others, ‘Machine Bias’ (*ProPublica*, 23 May 2016) <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing?token=MJx_BFsEFMNT2bSeAG2YZISppjWRS64u> accessed 21 September 2020.

³⁴ Dirk Helbing and others, ‘Triage 4.0: On Death Algorithms and Technological Selection. Is Today’s Data-Driven Medical System Still Compatible with the Constitution?’ (2021) 10 *Journal of European CME* <<https://doi.org/10.1080/21614083.2021.1989243>> accessed 20 December 2021.

³⁵ See Chapter 3, this volume, Helbing and Argota Sánchez-Vaquerizo.

³⁶ See Chapter 16, this volume, Blauth.

³⁷ Sarah Coble, ‘Angry Birds Developer Accused of Illegal Data Collection’ (*Infosecurity Magazine*, 26 August 2021) <<https://www.infosecurity-magazine.com/news/angry-birds-alleged-illegal-data/>> accessed 24 August 2022; Hu (n 21).

individuals.³⁸ Concepts such as group privacy thereby marked a shift from personally identifiable information to demographically identifiable information.³⁹ Further automatization processes that would use real-time data to gain insights in and eventually steer industrial, medical, and ultimately environmental and social processes gave rise to the term of digital twins.⁴⁰ The questions emerge as to how humans can still scrutinize the suggestions provided by immensely complex algorithmic models, how they can perform a meaningful and comprehensive review of automated decisions, and whether the human perception and reasoning might not become a limiting factor to the potential of the technologies. In other words, while AI might lack moral agency, the extensive use of and reliance/dependency on it reduces the moral agency of human actors. Furthermore, new concepts such as digital or artificial agency also result in concrete legal consequences. Artificial agency, for example, denotes autonomous actions without direct input from human agents as for example in self-driving cars. These autonomous systems cause tremendous legal conundrums when it comes to liability regimes and create a distance between moral agency of human actors and its results.⁴¹ Who is to blame when a self-driving car causes an accident with damage to people and property? The owner, the software engineer, the car producer, the sensor developer, and so on? The possibilities seem entirely endless, and society needs to approach this question with an overarching strategy and governance approach.

THE ROLE OF POLITICS AND GOVERNANCE IN MANAGING TECHNOLOGY

Big Data and AI have ushered in the fourth industrial revolution.⁴² The first two industrial revolutions refer to the steam engine and electricity

³⁸ Siddique Latif and others, 'Caveat Emptor: The Risks of Using Big Data for Human Development' (2019) 38 IEEE Technology and Society Magazine 82.

³⁹ Linnet Taylor, Luciano Floridi and Bart van der Sloot (eds), *Group Privacy: New Challenges of Data Technologies* (Springer International Publishing 2017) <<https://www.springer.com/gp/book/9783319466064>> accessed 30 March 2020; Nathaniel A Raymond, 'Beyond "Do No Harm" and Individual Consent: Reckoning with the Emerging Ethical Challenges of Civil Society's Use of Data', *Group Privacy* (Springer 2017) <http://link.springer.com/chapter/10.1007/978-3-319-46608-8_4> accessed 3 September 2017.

⁴⁰ See also Chapter 4, this volume, Rahmadian, Feitosa and Zwitter; Chapter 3, this volume, Helbing and Argota Sánchez-Vaquerizo.

⁴¹ See Chapter 15, this volume, Vellinga.

⁴² Klaus Schwab, *The Fourth Industrial Revolution* (Crown 2017).

respectively, whereas the third might be termed the digital revolution. The fourth revolution adds an automation component through AI, which only became possible with the emergence of high-speed data transmission, large-scale data processing and related features that are typically expressed through the concept of Big Data. Since this approach to data management and processing has become so fundamental to industry and government, it also causes shifts in power balances between those who deploy the tools and those who create them, as well as between those who produce data (often without their intent or awareness—‘data exhaust’) and those who collect, process and use them. Such power shifts are always accompanied by ethical problems.⁴³ These result from an emergence of new economies that still require regulation (e.g. the data economy) and the emergence of new monopolies such as social media giants (e.g. Meta, TikTok, Twitter).

New technologies of the kind that cause such shifts in power relations require new social compacts between those who hold the means of data collection, information production and distribution and those who are affected by it. Such agreements on how to ensure that this power will not be misused and that negative ethical consequences for individuals, groups and the governance institutions are averted are yet to be made. We are in the very beginning of the formation process of regulatory frameworks for Big Data and AI. And there are still many open questions, many problems yet to be discovered, and many governance and regulatory holes to be plugged.

Additionally, the questions on how to engage with Big Data infrastructures and AI are also projected in the regulatory domain, with bodies such as the Council of Europe and the EU working on regulatory frameworks. This also happens with the aspiration either to become standard-setting organizations on the international level (‘the Brussels effect’), or at least to start a movement towards more international political cooperation that focuses not purely on power-based pursuit of short-term interest.⁴⁴ Besides such regional developments, discussions are also ongoing on the level of the UN. These cover topics such as how to regulate Lethal Autonomous Weapons Systems, or how to reach an international agreement on cybercrime.⁴⁵ The question is, however, how influential such regulatory frameworks can become in light of factual developments and the development of technology largely controlled by a few massive

⁴³ Zwitter (n 1).

⁴⁴ Gstrein and Zwitter (n 29).

⁴⁵ ‘Council of Europe Convention on Cybercrime: A Future-Proof International Benchmark?’ (*IPPI*, 30 June 2022) <<https://www.ippi.org.il/council-of-europe-convention-on-cybercrime/>> accessed 24 August 2022.

corporations, and the seeming unwillingness of states to commit to constructive multilateral cooperation.⁴⁶

STRUCTURE OF THE HANDBOOK

This research handbook consists of five parts, covering the topic of the governance and politics of Big Data and AI from different perspectives. The parts are designed in a way to logically flow from conceptual perspectives to principle-based approaches, before considering specific sectors in more detail. The last part is dedicated to a point of departure that is more technology-centric and approaches the subject of autonomous systems, rights and duties from different perspectives that complement each other.

Following Part I, ‘Introduction’, we continue with Part II, ‘Conceptual Perspectives’, covering topics such as group privacy and abnormal justice (Chapter 1), emergent data-sharing practices in the humanitarian sector (Chapter 2), and the conceptual development, application and ethical considerations surrounding digital twins (chapters 3 and 4). Part III presents ‘Principle-based Approaches to the Governance of Big Data and AI’ and addresses some fundamental categories such as justice, peace and conflict (Chapter 5), a principle-oriented perspective on how to approach autonomous weaponry from the perspective of international relations (Chapter 6), the role of these emerging technologies for shifting power relations in the international economy (Chapter 7), as well as the impact of AI on the perception and representations of gender (Chapter 8). Part IV (‘Sectoral Approaches to Big Data and AI Governance’) deals with the way different sectors have approached the regulation of the harmful effects of data collection and processing in different fields. It covers privacy preservation in cyberspace (Chapter 10), as well as in the real world in the case of facial recognition (Chapter 11). It also addresses the question of how security applications should be designed when taking the possibilities of the new technologies into account, while keeping the outcomes focused on the human agents (Chapter 9). Furthermore, this part discusses the national, regional and international legal frameworks pertaining to health data (Chapter 12); and it deals with the implications of using AI in the education sector (Chapter 13).

In the concluding Part V (‘Autonomous Systems, Rights and Duties’), the insights from the previous parts in different forms converge when

⁴⁶ See Chapter 16, this volume, Blauth.

authors discuss, for example, whether AI and autonomous systems should have rights (Chapter 14). The types of rights the authors argue for are different from human rights and should not be confused with them. Furthermore, the part provides normative guidance on questions such as how to design liability regimes and security systems that can cope with the implications of AI while keeping human dignity in mind (Chapter 15). In addition, the question of what is left of meaningful human control when weapons become autonomous challenges fundamental ideas of moral agency in an era of automation and smart machines (Chapter 16).

This handbook and its thematic parts can by no means cover all relevant aspects pertaining to the subject of politics and governance of AI and Big Data. However, it provides novel insights into existing debates and opens spaces for insights into new subject areas that have up until now received only limited attention. We hope the readers of the handbook have as much joy exploring the contents as we had during putting it together. Finally, we wish to sincerely thank all authors who contributed to this volume.

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REFERENCES

- ‘A Europe Fit for the Digital Age’ (*European Commission – European Commission*) <https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en> accessed 24 August 2022.
- ‘A European Approach to Artificial Intelligence | Shaping Europe’s Digital Future’ <<https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>> accessed 24 August 2022.
- Adams-Prassl J, ‘Regulating Algorithms at Work: Lessons for a “European Approach to Artificial Intelligence”’ (2022) 13 *European Labour Law Journal* 30.

- Angwin J and others, 'Machine Bias' (*ProPublica*, 23 May 2016) <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing?to ken=MJx_BFseEFMNT2bSeAG2YZISppjWRS64u> accessed 21 September 2020.
- Arthur C, 'Tech Giants May Be Huge, but Nothing Matches Big Data' (*The Guardian*, 23 August 2013) <<http://www.theguardian.com/technology/2013/aug/23/tech-giants-data>> accessed 25 January 2022.
- 'Auditors Are Testing Hiring Algorithms for Bias, but There's No Easy Fix' (*MIT Technology Review*) <<https://www.technologyreview.com/2021/02/11/1017955/auditors-testing-ai-hiring-algorithms-bias-big-questions-remain/>> accessed 24 August 2022.
- 'Automating Society Report 2020' (*Automating Society Report 2020*) <<https://automatingsociety.algorithmwatch.org>> accessed 24 August 2022.
- Beaulieu A and Leonelli S, *Data and Society: A Critical Introduction* (SAGE Publications Ltd 2022).
- Blauth TF, Gstrein OJ and Zwitter A, 'Artificial Intelligence Crime: An Overview of Malicious Use and Abuse of AI' (2022) 10 IEEE Access 77110.
- Coble S, 'Angry Birds Developer Accused of Illegal Data Collection' (*Infosecurity Magazine*, 26 August 2021) <<https://www.infosecurity-magazine.com/news/angry-birds-alleged-illegal-data/>> accessed 24 August 2022.
- Corbyn Z, 'Microsoft's Kate Crawford: "AI Is Neither Artificial nor Intelligent"' *The Observer* (6 June 2021) <<https://www.theguardian.com/technology/2021/jun/06/microsofts-kate-crawford-ai-is-neither-artificial-nor-intelligent>> accessed 24 August 2022.
- 'Council of Europe Convention on Cybercrime: A Future-Proof International Benchmark?' (*IPPI*, 30 June 2022) <<https://www.ippi.org.il/council-of-europe-convention-on-cybercrime/>> accessed 24 August 2022.
- Floridi L, 'On Human Dignity as a Foundation for the Right to Privacy' (2016) 29 *Philosophy & Technology* 307.
- Foucault M, *Discipline & Punish: The Birth of the Prison* (Vintage 1995).
- González Fuster G, 'The Right to the Protection of Personal Data and EU Law' in Gloria González Fuster (ed.), *The Emergence of Personal Data Protection as a Fundamental Right of the EU* (Springer International Publishing 2014) <https://doi.org/10.1007/978-3-319-05023-2_7>.
- Greenleaf G, 'Now 157 Countries: Twelve Data Privacy Laws in 2021/22' (Social Science Research Network 2022) SSRN Scholarly Paper 4137418 <<https://papers.ssrn.com/abstract=4137418>> accessed 24 August 2022.
- Gstrein OJ and Beaulieu A, 'How to Protect Privacy in a Datafied Society? A Presentation of Multiple Legal and Conceptual Approaches' (2022) 35 *Philosophy & Technology* 3.
- Gstrein OJ, Kochenov DV and Zwitter A, 'A Terrible Great Idea? COVID-19 "Vaccination Passports" in the Spotlight' [2021] Centre on Migration, Policy and Society Working Papers 28.
- Gstrein OJ and Zwitter AJ, 'Extraterritorial Application of the GDPR: Promoting European Values or Power?' (2021) 10 *Internet Policy Review* <<https://policyreview.info/articles/analysis/extraterritorial-application-gdpr-promoting-europe-an-values-or-power>> accessed 26 January 2022.
- Helbing D and others, 'Triage 4.0: On Death Algorithms and Technological Selection. Is Today's Data-Driven Medical System Still Compatible with the Constitution?' (2021) 10 *Journal of European CME* <<https://doi.org/10.1080/21614083.2021.1989243>> accessed 20 December 2021.

- Hu M, 'Cambridge Analytica's Black Box' (2020) 7 *Big Data & Society* 2053951720938091.
- Latif S and others, 'Caveat Emptor: The Risks of Using Big Data for Human Development' (2019) 38 *IEEE Technology and Society Magazine* 82.
- Mac R and Kang C, 'Whistle-Blower Says Facebook "Chooses Profits Over Safety"' *The New York Times* (3 October 2021) <<https://www.nytimes.com/2021/10/03/technology/whistle-blower-facebook-frances-haugen.html>> accessed 26 January 2022.
- Mayer-Schönberger V and Cukier K, *Big Data: A Revolution That Will Transform How We Live, Work, and Think* (Houghton Mifflin Harcourt 2013).
- Mejias UA and Couldry N, 'Datafication' (2019) 8 *Internet Policy Review* <<https://policyreview.info/concepts/datafication>> accessed 24 August 2022.
- Oltermann P, 'European Politicians Duped into Deepfake Video Calls with Mayor of Kyiv' *The Guardian* (25 June 2022) <<https://www.theguardian.com/world/2022/jun/25/european-leaders-deepfake-video-calls-mayor-of-kyiv-vitali-klitschko>> accessed 24 August 2022.
- Raymond NA, 'Beyond "Do No Harm" and Individual Consent: Reckoning with the Emerging Ethical Challenges of Civil Society's Use of Data', *Group Privacy* (Springer 2017) <http://link.springer.com/chapter/10.1007/978-3-319-46608-8_4> accessed 3 September 2017.
- Rikap C and Lundvall B-Å, *The Digital Innovation Race: Conceptualizing the Emerging New World Order* (Springer International Publishing 2021) <<https://link.springer.com/10.1007/978-3-030-89443-6>> accessed 24 August 2022.
- Schwab K, *The Fourth Industrial Revolution* (Crown 2017).
- Taulli T, *Artificial Intelligence Basics: A Non-Technical Introduction* (2019) <https://link.springer.com/epdf/10.1007/978-1-4842-5028-0_1> accessed 24 August 2022.
- Taylor L, Floridi L and Sloot B van der (eds), *Group Privacy: New Challenges of Data Technologies* (Springer International Publishing 2017) <<https://www.springer.com/gp/book/9783319466064>> accessed 30 March 2020.
- The Economist, 'The World's Most Valuable Resource Is No Longer Oil, but Data' [2017] *The Economist* <<https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>> accessed 10 December 2019.
- Young GK, 'How Much Is Too Much: The Difficulties of Social Media Content Moderation' (2022) 31 *Information & Communications Technology Law* 1.
- 'ZhōngHuá Mundus | A Regulatory Iron Fist for Chinese Big Tech' <<https://mailchi.mp/92448ff21d57/bruegel-china-newsletter-november-2021>> accessed 24 August 2022.
- Zwitter A, 'Big Data Ethics' (2014) 1 *Big Data & Society* 205395171455925.
- Zwitter A, 'The Artificial Intelligence Arms Race' (*Policy Forum*, 27 July 2017) <<https://www.policyforum.net/artificial-intelligence-arms-race/>> accessed 3 September 2017.
- Zwitter A and Hazenberg J, 'Cyberspace, Blockchain, Governance: How Technology Implies Normative Power and Regulation' in Benedetta Cappiello and Gherardo Carullo (eds), *Blockchain, Law and Governance* (Springer International Publishing 2020).
- Zwitter A and Hazenberg J, 'Decentralized Network Governance: Blockchain Technology and the Future of Regulation' (2020) 3 *Frontiers in Blockchain*

<<https://www.frontiersin.org/articles/10.3389/fbloc.2020.00012/full>> accessed 13 May 2020.

Zwitter AJ, Gstrein OJ and Yap E, 'Digital Identity and the Blockchain: Universal Identity Management and the Concept of the "Self-Sovereign" Individual' (2020) 3 *Frontiers in Blockchain* <<https://www.frontiersin.org/articles/10.3389/fbloc.2020.00026/full>> accessed 11 November 2020.