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# 1. Introduction to the *Research Handbook on Law and Technology*

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## 1. LAW AND TECHNOLOGY: A BIRD'S-EYE VIEW

Law and technology<sup>1</sup> is in flux. Over the last decade, the “field” has gone from being a niche endeavor to establishing itself as one of the central discourses in the legal scholarly mainstream. From a growing body of literature interrogating the relationship between law and technologies, over new (and now well-established) research centers<sup>2</sup> and journals<sup>3</sup> bringing the communities together, to LLM programs aiming to educate future tech law professionals, law and technology is expanding, maturing, and evolving. The “field” no longer seems temporary or emerging (if it ever was). And, as it develops, it simultaneously becomes richer and more challenging to navigate.

The interest in law and technology is hardly surprising. Technology mediates ever-more daily activities, from shopping and entertainment to communication, dating, or exercising. At the same time, socio-technological reality continues to transform and provide themes for reflection. Artificial intelligence, cryptocurrency bubbles, and concerns associated with privacy and data protection capture the imagination of policymakers, civil society, and (legal) scholars. Digitalization and automation of the market and the government challenge the law’s assumptions about what is possible, shifting the power dynamics between different actors. Such changes, real or perceived, trigger lawyers’ intuitions about opportunities and threats,

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<sup>1</sup> We use the term “law and technology” broadly, when referring to a variety of scholarly discourses concerning the intersections of law and technology, as to distinguish the object of analysis from specific laws and specific technologies themselves. Different authors use different concepts, sometimes similar and sometimes different in meaning. For the purpose of this chapter, “law and technology” also includes such concepts as technology law, technology and law, legal tech, and techlaw, which are addressed and unpacked in some of the contributions.

<sup>2</sup> A non-exhaustive list includes the International Legal Technology Association, founded in 1980 (<https://www.iltanet.org/home>); the Centre for IT & IP Law at KU Leuven, founded in 1988/1990 (<https://www.law.kuleuven.be/citip/>), Berkman Klein Center for Internet & Society, founded in 1996 (<https://cyber.harvard.edu/>), the Information Society Project of the Yale Law School, founded in 1997 (<https://law.yale.edu/isp>), CodeX: Stanford Center for Legal Informatics, founded in 2006 (<https://law.stanford.edu/codex-the-stanford-center-for-legal-informatics/>), Transatlantic Technology Law Forum, established in 2004 by the Stanford law School Program in Law, Science and Technology and the University of Vienna School of Law (<https://law.stanford.edu/transatlantic-technology-law-forum/>), The Centre for Technology, Robotics, Artificial Intelligence & the Law of the National university of Singapore, launched in 2019 (<https://law.nus.edu.sg/trail/about-us/>).

<sup>3</sup> E.g., Harvard Journal of Law and Technology (<https://jolt.law.harvard.edu/>), Berkeley Technology Law Journal (<https://btlj.org/>), Stanford Technology Law Review, International Journal of Law and Information Technology, Review the European Journal of Law and Technology (<https://ejlt.org/index.php/ejlt>), Technology and Regulation (<https://techreg.org/>), the Artificial Intelligence and Law Journal (<https://www.springer.com/journal/10506>).

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expressed in scholarship, popular media, and policy briefs. In some jurisdictions, like the European Union, these changes have already translated into intense legislative efforts aimed at “mitigating the risks without impeding the benefits” of technology.<sup>4</sup>

Legal reflection on technology is not a new phenomenon. As demonstrated by several contributions to this *Research Handbook*, some branches of law, including traffic, antitrust, intellectual property, consumer law, or privacy, emerged largely due to socio-technological changes, and have continued to transform in relation to them (see, e.g., the chapters by Jabłowska, Lachlan, and Robb, Laskowska-Litak, and Micklitz, Pericles, and Woodcock in this *Research Handbook*). Legal education and legal practice have always been predicated upon a given state of technology (see the chapter by Hildebrandt in this *Research Handbook*). And even regarding the “emerging” digital technologies like software, the internet, robots, and artificial intelligence, serious legal research and reflection have been ongoing at least since the 1990s (see the influential works of Jack Balkin (1995), Julie Cohen (1995, 1999), Lawrence Lessig (1999a, 1999b), Michael Froomkin (1996, 1999), Giovanni Sartor (1993), and many others).

Some things, however, are changing. Gradually, the predominant feeling has shifted from excitement to caution or even fear. For example, social media – nowadays blamed for polarization, manipulation, and intrusions upon privacy (Hacker, 2021; Susser et al., 2019; Zuboff, 2019) – were hailed by some as the facilitators of civic engagement and democracy only a decade ago (Gil de Zúñiga et al., 2012; Tudoroiu, 2014; Warren et al., 2014). Related to that, the regulation of digital technologies, once seen as impossible (due to the internet’s transnational character) or undesirable (as potentially stifling innovation), nowadays presents itself as necessary or unavoidable. Moreover, the omnipresence of digitalization and automation make clear that even the traditional, “black letter” fields of legal scholarship – e.g., contract, criminal, administrative, and constitutional law – need to account for the omnipresent socio-technological changes. The fast pace of technological advancement contributes to the feeling of uncertainty and urgency, both driving and shaping the contributions to law and technology.

Yet even an account like this – comforting in the order it attempts to bring – is a gross simplification. Unlike many other fields of legal research, mapping the history, or the general contours of law and technology, as a separate or coherent academic “discipline,” is close to impossible. Law and technology is not one community of discourse; neither is it one “field,” nor one “approach.” Furthermore, and unlike many other “fields,” law and technology does not have an established methodology or a central normativity. Moreover, law and technology can hardly be seen as a separate branch of law (Cockfield, 2003), akin to health law or environmental law. Technology is entrenched in numerous legal aspects, and legal scholars have been tapping into the most salient issues related to the development and application of technologies from different angles.

Rather, law and technology, in its totality, is multifaceted. Next to the divergence in methods and normativities, one should be mindful of the evident geographical divide between

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<sup>4</sup> Examples mostly discussed in the literature at the moment of writing include the proposal for a Regulation of the European Parliament and of the Council laying down harmonized rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, COM(2021) 206 final; the Regulation (EU) 2022/1925 of the European Parliament and of the Council of September 14, 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) [2022] OJ L265/1; Regulation (EU) 2022/2065 of the European Parliament and of the Council of October 19, 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L277/1.

the development of law and technology scholarship. While the discourse seems to have been largely pioneered by the scholars already in the position of privilege, i.e., those writing in and on the Global North (and, in particular, the Anglo-Saxon traditions), literature on law and technology in Asian and African countries has been recently growing in prominence and impact.

Consequently, it is not surprising that academic research falling under the umbrella term “law and technology” is so diverse. Among many themes and approaches, one may attempt to rethink fundamental questions about the relationship between various technologies and the law; engage in discussing how and when the emerging technologies should be regulated, if at all; explore how certain legal tasks, or even legal reasoning at large, could be automated; interrogate what structural social problems technology exacerbates and what it makes salient; examine how technologies challenge the regulatory landscape of such established fields as constitutional, administrative or criminal law; or how technology takes a role of the regulator and what consequences it brings to the legitimacy of rule-making. The list of types of legal questions pertaining to technological advancement is non-exhaustive and constantly evolving. What is generally termed as “law and technology” has thus become an amalgam of different projects, schools of thought, and communities of discourse.

All this makes law and technology a thrilling endeavor: the objects of study, be it socio-technical practices or the laws governing them, transform incredibly fast. The methods of research are often themselves an opportunity for experimentation. This excitement, however, comes with many traps. Given the fast pace of technological development, some studies might lose relevance, or even become obsolete, in less than a couple of years. Certain projects risk being termed as “hypes” by the scholarly community, questioning whether engaging with the questions they pose, and the answers they seek to offer, is truly worth an academic effort (though, as Robb and Tranter argue in this *Research Handbook*, hype might not necessarily be a bad thing, and are sometimes even necessary to foster lawyers’ thinking on technological advancement). Navigating the ever-changing scholarly discourses, continuously producing papers about laws and technologies, themselves in constant flux, is simultaneously gratifying and difficult, stimulating and stressful, liberating and constraining. Doing research in law and technology is hard, but it is also rewarding. If there is one thing that brings law and technology together, it is the authors’ urge to look beyond the legal text, onto the social world, and focus on what the current, or future, state of technical development renders (im)possible. What the next step could or should be, however, remains part of the challenge.

This *Research Handbook* does not aim to give a definite answer on how research on law and technology should be conducted or what areas are worth studying, let alone what law and technology means. Neither does it aim to provide any definite categorization of concepts relevant to the study of law and technology. Instead, by including diverse contributions from leading and emerging scholars from around the world, this volume offers a meta-reflection on various approaches for studying law and technology, inviting the readers to critically engage with the current state of the art and aiming to serve as a reference point to those embarking on an academic journey in this fascinating area.

## 2. THE FOCUS OF THE *RESEARCH HANDBOOK*

While introducing different conceptual and methodological treatments of the broader law and technology discourses, the contributions of this *Research Handbook* are guided by an

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overarching question: What does one need to know when embarking on research in law and technology? In a broader sense, the contributions analyze, through different lenses, how law and technology influence each other in the current digitalized society, how this influence has been, or could be, studied, and how could one understand both the relationships between law and technology, and the scholarly attempts to comprehend and influence them. In doing so, the *Research Handbook* intends to serve as a reference point for scholars researching various aspects of law and technology, and to be used as a tool assisting in the review of literature and relevant legislation while also offering a selection of methodological choices. As the literature is often abundant, and various discussions have been going on for years, this volume offers a way to “catch up” with the existing discourses, questions asked, answers proposed, and intuitions tested.

Furthermore, the *Research Handbook* invites the readers to remain critical when engaging with law and technology questions and approaches to answering them, by bringing together the champions and the new voices in the law and technology discourses, coming from different scholarly traditions and backgrounds. As in any area of scholarly reflection, law and technology may sometimes become path dependent, on subject, methods, and assumptions. There is a lot to learn from the existing scholarship but there is also a lot to question. In this sense, the *Research Handbook* is an invitation to challenge the existing paradigms.

Finally, the *Research Handbook* offers a “snapshot” of the state of the art in 2023, something akin to the “reports from the research frontiers” in these tumultuous times. Which of its insights will turn out to be timeless or prescient, and which will seem naïve or misguided in a decade? How will the scholarly community look back at this time in five, ten, or twenty years? Although it is impossible to know the future, the *Research Handbook* attempts to situate the law and technology research in history – looking back at the lessons of the past, and forward to the challenges awaiting. Current laws and technologies are the result of ideas promoted, ideologies crafted, and normative choices made over the last several decades. It is prudent to bear that in mind, as only then will one come close to fully understanding the current reality, while also appreciating the gravity of the law and technology discourses presently taking place.

### 3. THE STRUCTURE OF THE *RESEARCH HANDBOOK*

The *Research Handbook* consists of 29 contributions that reflect different frameworks, views on branches of law, perspectives, and challenges from within the law and technology research. Some contributions are theoretical and engage with specific concepts or legal and methodological problems. Others discuss concrete cases of the uses of particular technologies and how these fit into the current regulatory framework(s). Yet others scrutinize these problems from a normative perspective, pondering how these regulatory and legal frameworks should address the specific concerns arising from the use of technology.

#### 3.1 Frameworks

Part I of the *Research Handbook* discusses various frameworks and fundamental conceptions illuminating the broader horizontal questions about the complex relationships between law(s) and technology(ies). This part inquires: What is the relationship between law and technology, and how could or should this relationship be studied? Next to discussing methodologies and

central discourses in law and technology research, this part proposes some categorizations and invites the reader to critically rethink some of the concepts, approaches and normative stances in law and technology.

This part commences with a critical re-assessment of the possible approaches to the regulation of emerging socio-technological challenges. Roger Brownsword distinguishes three different kinds of tech governance conversations, Law 1.0, 2.0, and 3.0, offering a compelling way to order various research projects in law and technology. Viewing the law as one option of governance, Brownsword looks at the question of technology regulation through the lens of good governance, emphasizing that considerations of legitimacy, global commons, and respect for fundamental community values should prevail over those of effectiveness. In turn, Rebecca Crootof and BJ Ard analyze “techlaw” as the attempt of various legal actors to resolve various uncertainties brought about by technological change. They review two general approaches, namely applying the existing laws to new situations by analogy and creating new laws or shifting institutional powers to address the arising challenges. Zachary Cooper and Arno Lodder propose yet another angle, and focus on the law and technologies’ co-dependence, arguing that as the legal system entangled itself with the internet, it might paradoxically be less fit to regulate the emerging technologies based on fundamentally different architectures. They analyze how this process might unfold, and what consequences it might have, proposing to study the “the regulatory multiverse” of not necessarily coherent architectures.

Turning to the methodological challenges arising while studying, teaching, and researching the different paths of law and technology, Burkhard Schafer challenges the computational vision of law. He argues that when studying formalization or automatization of legal reasoning, one should focus on how specific formalization approaches affect conceptions of justice and the vision of a good legal system, and what ethical and legal implications are brought by different choices taken during the formalization processes. Przemysław Pałka and Bartosz Brożek proceed with highlighting the variety of methodological tools and approaches available to those embarking on research in law and technology. Noting that human minds, in general, gravitate toward cognitive conservatism, and are subject to peer pressure and various biases, they discuss how variation, caution and intuition can assist the researchers in formulating good research questions and offering innovative answers. Mireille Hildebrandt continues by discussing methods and approaches for education and research on computational technologies, proposing a hermeneutic approach, continuous adaptation, and a new understanding of the meaning of legal norms to the changing settings. She cautions against naïve ways of looking at the relationship between technology and the law, inviting a critical approach to what technologies claim to be doing and actually do, as well as calling for a stronger commitment to the law’s fundamental values in research and teaching.

Part I concludes by addressing the notion of “hypes” in “law and technology” research. Even though “hype” might strike many as a notion with negative connotations, Lachlan Robb and Kieran Tranter offer a different take. They argue that law and technology is an inherently “hyped” discourse, posit that “hypes” as such might actually be needed for making more humane technological futures, and invite scholars to engage more with the cultural imaginary.

### 3.2 Branches

Part II of the *Research Handbook* maps how technology influences, and is or could be influenced by, selected branches of law. Looking at technologies at large, the chapters in this

part focus on various elements of the legal system. While being helpful to researchers in the established legal discourses, this part, as a whole, seeks to reveal whether there are any convergences in the ways different branches of law deal with technological challenges.

The first three chapters engage with the issues from the border of public and private law, situating the current developments in their historical perspectives. Ramsi Woodcock takes the readers on the journey of antitrust development in the United States, demonstrating what one can learn from the interactions between law and technologies in the past and how these lessons can be relevant in the current litigation. He submits that technology creates dependence and is thus, first and foremost, about power. Taking the European perspective, Ewa Laskowska-Litak takes the reader through the history of EU copyright law, examining how the legal framework reacted to technological changes. She underscores that it is not a possession of a copy, but an access to its content that forms the central issue of the European copyright debate. She also questions the effectiveness of the regional approaches and the economic justifications for the legal solutions that have been dominating European copyright law. Staying in Europe, Agnieszka Jabłowska examines the impact of digital technologies on EU consumer law, focusing in particular on the problem of exploitation through personalization and the division of responsibility in multi-party settings. She reveals how the core themes of the EU consumer law – transparency and fairness – remain relevant in the platform economy.

Sofie Royer and Rune Vanleeuw open the discussion on human and fundamental rights by examining new types and iterations of crimes that arise from technologies' developments, and scrutinizing whether the substantial and procedural criminal law regulating these offenses should be technology-neutral rather than technology-specific. They conclude that the established criminal law is not yet ready to deal with the new types of harm stemming from technologies due to its inherent limits and conceptual shortcomings. Artur Pericles Lima Monteiro proceeds by discussing the right to informational privacy, revealing the theoretical disputes and conceptual shifts embodied by the “pragmatic turn,” as well as the potential limitations of the transition from privacy law to data governance. In the chapter that follows, Raphaële Xenidis revisits the application of EU anti-discrimination law on algorithmic discrimination. While examining the legal and practical shortcomings, she explains that to guarantee the protection of fundamental rights in the algorithmic society, EU non-discrimination law should be applied in a teleological and instrumental manner, bearing in mind the value-laden framings of socio-technical artifacts and articulating the normative equilibria underpinning existing legal constructs.

Kanetake and Ionita take the discussion on fundamental rights to the global level. They analyze the role that the UN plays, and could play, in safeguarding human rights protection in the digital age, focusing on freedom of expression, non-discrimination, and right to privacy. Continuing the global perspective, Leonie Reins analyzes the fields of environmental, climate and energy law (“ECEL”), their principles and interactions, and implications for technology regulation. She notices that, paradoxically, technology is both the main contributor to, and mitigator of, climate change and pollution, and that technology can thus both threaten and strengthen sustainable development.

### **3.3 Perspectives**

Part III introduces the different and specific perspectives in law and technology, and aims to emphasize voices, emerging views and takes sometimes overlooked, yet rapidly gaining

prominence in the scholarship. It inquires how law and technology debates are shaped by perspectives different methodologically, conceptually and geographically. The aim of the part is to reveal the inner diversity of the discourse and invite the readers to look at the seemingly familiar problems through new lenses.

This part starts with perspectives on law and technology that go beyond the discourses shaped by the Global North. Introducing the Afro-centric perspective on law and technology, Caroline B. Ncube and Thabiso R. Phiri discuss the rich array of African contributions and argue that technology regulation needs to be carefully fine-tuned to the African context in order to ensure that the legal framework does not further develop inequality and digital divide. On top of masterfully reconstructing the arguments of the African anglophone scholars, they bring the readers' attention to the question of whose voices shape the discourse, who is traditionally heard and who is too often ignored. In the chapter that follows, Binit Agarwal and Neha Mishra examine the digital divide from the perspective of global trade, highlighting the shortcomings of international trade law when dealing with the issues of digital commerce. Their chapter both illuminates the problem of bias in the context of trade law itself, but also serves as a template for broadening focus when analyzing other areas of law.

The next three chapters address various changes brought by technologies that challenge the established legal orders, requiring new normative perspectives. Francisco de Abreu Duarte, Giovanni De Gregorio and Angelo Golia illustrate how constitutional values and the public-private regulatory divide are reshaped through the use of emerging technologies, and how this regulatory shift can be understood and interpreted through the liberal, societal and global perspectives on the "digital constitutionalism." Olia Kanevskaia proceeds by discussing how technical and technology standards are increasingly gaining legal force in the European Union and the United States, and how the legitimacy of these standards is challenged by their private ownership. In turn, Helen Eenmaa reviews how new technological constraints may normatively alter the nature obligation of and relations between contract parties and, in the broader sense, how emerging technologies challenge the traditional doctrinal categories of private law.

The two following chapters aim to look at law and technology from the outside of the mainstream legal discourses. Restating the co-dependence between law and technology, Kasper Hedegård Schiølin sheds light on the issue of technology regulation from the Science, Technology, and Society (STS) perspective, challenging the established distinctions between the positive and normative questions. He surveys the rich contributions of the STS, and invites the legal scholars to critically examine the assumptions they often tacitly make. In turn, Hans-Wolfgang Micklitz, drawing on his "latecomer's" perspective, offers an "outsider's" view on law and technology. He ponders what it means to be an outsider or an insider, and how the inner dynamics of different communities of discourse shape the content and the context of their contributions.

### 3.4 Challenges

Part IV of the *Research Handbook* focuses on the newly arising challenges from particular technologies that need further concretization and potential conceptual or normative responses. The question this part, as a whole, seeks to ponder on is: what kind of challenges do development and social adoption of technology bring to the law, and is there, or should there be, a common approach to address such emerging challenges?

The first four chapters of this part address technologies that heavily rely on automated decision-making. Magdalena Pacholska analyzes the use of autonomous weapons under the regime of international law, introducing the reader to the complex technical field and the heated scholarly debates. Looking at the problem of attribution of responsibility, she argues that it is the application of international law, rather than the law itself, that may produce flaws in addressing the problems stemming from the use of autonomous weapons. Michael Froomkin provides the US perspective on the legal questions pertaining to the broader field of robot technologies, discussing how the complex emerging law and policy issues change fundamental legal arrangements. He offers a tour de force of the debates ongoing for decades now, critically examining the intuitions tested over the years, as well as the challenges to come. Riika Koulou, Suvi Sankari, Hanne Hirvonen, and Tatjaana Heikkinen address the needs, challenges and possibilities to regulate artificial intelligence, taking as an example the recent AI proposal in the European Union. They situate the AI Act in the long-term perspective on technology regulation, and critically examine the promises and perils of the European Union's current approach. Finally, Andrzej Porębski develops this further by looking at machine learning systems developed and used in the context of legal practice. He discusses two general problems that arise at the intersection of machine learning and law – incomprehensibility and the lack of transparency – and invites lawyers to partake in the debate on the creation of machine-learning-powered legal tech.

In the following chapter, Jed Meers, Simon Halliday, and Joe Tomlison examine how we can ensure that the use of technologies in administrative decision-making is fair, emphasizing the importance of the citizens' perspectives and experiences. Drawing on their own empirical research, they demonstrate the need to supplant the armchair legal scholarship with continuous reality checks. Giuseppe Colangelo and Eleonora Pierucci then discuss specific issues arising from the application of antitrust law and patent law to technologies that are essential for technological interoperability, providing an overview of recent developments in the regulatory and policy landscapes and case law. In the final chapter, Dan Traficonte reviews the most salient legal and regulatory issues of blockchain technologies, taking a sober look at how much this technology has actually affected social practices. He focuses in particular on securities and intellectual property laws, and suggests that increased regulation can remedy arising concerns of consumer protection and market manipulation.

#### 4. CONCLUSION

The divergent contributions of this *Research Handbook* demonstrate that what is often termed as the “field” of law and technology represents multiple communities, discourses, and schools of thought, sometimes loosely connected by the interest in deeper legal and societal questions pertaining to broadly understood “technologies.” Research on law and technology is inherently multidisciplinary and involves considerations of different perspectives. This plurality of approaches, perspectives and methodologies is perhaps what sets it apart from other “law and ...” discourses (see the chapter in this *Research Handbook* by Micklitz on this matter).

Due to this conceptual and methodological plenitude, answering the main questions that each part pursues is a challenging exercise, but it is worth a try. As it appears from the contributions in Part I (“Frameworks”), the marriage of law and technology is one of co-dependence and co-influence; methodological approaches for studying these relationships should reveal



the broader picture of the current dynamics in law, regulation and governance, bearing in mind the normative concepts of justice and the aim of the legal system. The contributions of Part II (“Branches”) demonstrate that the co-dependence between law and technology is unpredictable, even though history can teach us some important lessons on the development of this relationship. In various legal systems, technologies can be used as a sword and as a shield. And while some traditional and established fields of law appear to sometimes be ill-equipped to address concerns arising from technological advancements, newer legal frameworks could potentially be more adaptive to new technologies, though this focus on “newness” comes with its own traps. Part III (“Perspectives”) adds to this that law and technology can be studied from different perspectives that challenge the current concepts and normative understandings. To address some specific legal challenges posed by the rapid pace of technological development, a shift in conceptual thinking might often be in order. That said, one should also be cautious when borrowing concepts from other disciplines to be applied to specific legal questions. Lastly, and perhaps not surprisingly, Part IV (“Challenges”) demonstrates that there is no common approach for addressing legal and policy challenges that arise from the use of specific technologies. In some cases, the stronger presence of public regulation is required, while in others, private ordering together with the proper application of the existing legal framework might appear sufficient.

Despite their diversity, the contributors seem to generally agree on two points. First, law and technology are becoming inseparable. Their relationship is characterized by increasing co-dependence. Second, lawyers and legal scholars cannot, and should not, shy away from studying new technologies. Whether one thinks of themselves as a law and technology scholar, or as a “traditional” black letter lawyer, technological change will neither go away nor slow down, most probably. The ability to study and interpret the relationships of law and tech becomes both a necessary tool in a legal scholar’s apparatus, and a social need, if the technological development is to be steered in a direction respecting the fundamental rights and legal values.

Among the many themes of the *Research Handbook*’s contributions, one may notice some recurring questions and issues: are the existing legal frameworks sufficient to address the present and arising challenges brought by technologies? What are the possible regulatory approaches to address specific issues? Should such regulation take place at the national or international level? And what are the best and the worst regulatory practices? Without a doubt, these and more questions are bound to continue to arise as digitalization and the use of technologies progress, and the current answers to these questions, if there are any, will be challenged by many generations of “law and technology” scholars. This, however, is a topic for the future volumes and handbooks.

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