Technology and Regulation

Of Horses and Other Animals of Cyberspace

Editorial

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In this introductory article to the new journal *Technology and Regulation,* I give a somewhat personal account of the history of cyberlaw and technology law and the 'struggles' some scholars have finding their spot in the more general legal realm. It will recount some of the classic discussions in the field, such as whether cyberlaw is just a form of the 'Law of the Horse'. It also outlines the contours of the field of technology regulation, some of the open questions in defining this field and some of its constituent elements. Finally, questions that I hope will be addressed in future articles in the journal are provided.

1. Coping with change

Courts are used to coping with change. Sometimes they face changes in society, for instance due to technological advances, which shake the foundations on which legal concepts are grounded. The move from atoms to bits is an example of such foundational friction. Courts and legislators have had to deal with questions about how the law relating to atoms applies to cases involving bits (in the absence of bits-specific law), facing the fact that bits and atoms have different properties and finding that the law is not adequately suited to cope with relevant differences.

In the Dutch legal history, a long legal battle was fought about the proper legal treatment of certain intangibles. It started in 1921 with a dentist in The Hague tapping electricity from the grid by tampering with his electricity meter. The courts, up to the Supreme Court, faced the question whether this act amounted to electricity theft. The Criminal Code at the time was tailored to deal with tangible objects, as was the Civil Code. It talks about taking away 'goods', which is traditionally understood as physically taking something in one's hands and running off with it. The Dutch Supreme Court adopted a teleological interpretation of the provision, stating that its purpose is to protect the assets of its owner. Assets generally have some independent existence, can be controlled by humans, can be transferred and accumulated and represent a certain value, according to the Court. Electricity shares these properties, and – like tangibles but unlike intellectual property – is the product of physical labor (they are atoms rather than bits), and can hence be seen as an asset that is worthy of protection against theft, the ruling states.[1] With this ruling, goods lost their tangibility under Dutch criminal law. Legal scholarship was divided over the extensive interpretation of the concept of 'good' adopted by the court, which was deemed infringing the Nulla poena sine lege stricta[2] principle.

A next case in this series concerned a woman who had accidently received a sum of money on her bank account. She subsequently spent the money, but was charged with embezzlement (art. 321, Dutch Criminal Code). Following the 1921 electricity reasoning, the Supreme Court qualified credit on a bank account under 'good' as mentioned in the Criminal Code because the credit represents value and furthermore the money can be spent only once.[3] Thus, cashless money – which consists of bits rather than atoms – was brought under the concept of 'good'.

This raised questions when computer data, as a new species of intangibles, came up in cases in which defendants were charged with theft or embezzlement. Initially, various Dutch courts adjudicated cases concerning computer data, repeating the reasoning above, before realizing that there is something crucially different between things amenable to theft and those that are not. The first notable case dates from 1983.[4] It concerns a programmer taking a disk pack[5] from his former employer and using the source code stored on the disks to develop a competing software application. Some things were completely clear, including that taking the disk pack qualifies as theft. But what about the data on the disk? Were these stolen? The court,

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[1] The Supreme Court adopts a restricted interpretation of assets and considers Intellectual property, such as copyright and patents, out of scope.
[2] Also known as *Nulla poena sine lege previa*.
[3] HR 11 mei 1982, NJ 1982/583, m.nt. 't H.
[4] Hof Arnhem (strafkamer) 27 oktober 1983, NJ 1984, 80 CR 1984-1, p.31, m.nt. J.M.Smits, (Computergegevens).
[5] https://en.wikipedia.org/wiki/Disk_pack.

to the dismay of some scholars, adopted the same reasoning as the Supreme Court had done in the 1921 and 1982 cases.

Then, in 1995/1996 two cases decided by the Supreme Court changed the course, settling that bits are not to be treated as atoms.[6] The 1995 'PIN code' case was a first eye-opener.[7] The case involved an assault in which the victim was deprived of his bank card (while drawing money from an ATM) and was forced to disclose the PIN code to the robber. The Supreme Court realized that in such a case the possessor of the PIN code does not lose it as an effect of disclosing it and that only a copy is provided, unlike the theft or extortion of a tangible good. The 'multiple' nature of computer data (more people can have possession of them at the same time) makes them fundamentally different from physical goods.

The same reasoning was followed in the Supreme Court's 'computer data' ruling,[8] in which a network manager had copied files without permission of the owner of the computer system (similar to the 1983 case mentioned above). The Supreme Court here moves back to the question whether computer data are 'goods' instead of approaching the issue along the lines of protectable assets. The Court re-iterates that for embezzlement (art. 321, Criminal Code) to be applicable, computer data should qualify as 'goods'. This is not the case with computer data according to the Court because this requires 'the holder to lose exclusive control over the data', which is not the case here. The system's owner can still access the original data, the network manager only had obtained a copy.

The Supreme Court in these two cases acknowledges that the traditional provisions for theft, extortion and similar in the Criminal Code do not cover acts involving making copies of intangibles.

It looked as if the legislator and courts had herewith definitively settled the matter – bits are not to be treated under the atoms-based provisions in criminal law – and thus addressed the foundational friction in the law caused by the rise of computer technology. However, in the 2010s, new developments in digital technologies reopened the struggles of courts with the properties of atoms and bits, the Runescape[9] and phone credit (Belminuten)[10] cases. In the Runescape case, a player was forced to hand over a virtual good (a mask and an amulet). The physical force took place in the real world but concerned virtual objects in the virtual world of the game Runescape. In this case, the various considerations raised in the earlier cases meet. The virtual objects are data (much like in the computer data cases), but there is exclusive control over the data (like in the cashless money case). The Supreme Court ruled that although the virtual objects are a type of computer data, they, like electricity share properties of assets worthy of protection against theft and extortion because they represent value and furthermore they exhibit exclusive use. Virtual goods can therefore be the object of theft in criminal law. A similar reasoning was adopted in the phone credit case, which dealt with a stolen SIM card that contained credit for making phone calls and sending text messages.[11] This made sense in the context of a digital environment in which some computer data constitute unique objects whose value can be used by only one person at the same time, rather than multiple objects whose value can benefit several people simultaneously. However, it also opens up a new area of uncertainty – and therewith new friction – since now, courts will have to assess whether computer data in a particular case are to be treated as similar to atoms (in the line of the electricity judgement) or as similar to bits (in the line of the 1996 computer data judgement).

What we see in the cases discussed is that the courts cope with new situations through, for instance, teleological interpretation and by expanding and contracting the scope of concepts. What is at play could be described as an attempt to maintain (dual) *coherence*[12] in law: "the reading that is adopted must maintain a thread of continuity with the jurisprudence; and, secondly, the reading must cohere with the constitutive (moral) values of a particular legal order".[13]

1.1 The new kid on the block

Law is a living, flexible system and has ways of accommodating new situations and phenomena. Sometimes the changes induced by new technologies are profound and have the potential to significantly disrupt the law. The emergence of Cyberspace was such a change. Although lawyers are said to be slow in picking up technological changes, it would be fair to say that the famous *Law of Cyberspace Conference* at the University of Chicago in 1996 was an example of legal scholars seeing early where the puck is heading. The conference made at least two people famous: Judge (and professor) Frank H. Easterbrook and professor Lawrence Lessig. It assembled a group of enthusiastic legal scholars who saw the legal challenges of the Internet coming and discussed the prospects of Cyberlaw, the law needed to regulate this new space. Easterbrook, however, immediately threw water on the enthused spirit in his keynote address called "Cyberspace and the Law of the Horse".[14] The passage of his keynote that drew most attention referred to a claim by former dean of the University of Chicago Law School, Gerhard Casper, that teaching the 'Law of the Horse' would be nonsense. With the Law of the Horse, he meant the legal body of knowledge relating to all things horses, including sales of horses, injuries caused by horses, licensing and races of horses etc.[15] Easterbrook extends this argument to Cyberspace. There is no need for specialized or niche legal studies applied to Cyberspace:

> "...the best way to learn the law applicable to specialized endeavors is to study general rules. Lots of cases deal with sales of horses; others deal with people kicked by horses; still more deal with the licensing and racing of horses, or with the care veterinarians give to horses, or with prizes at horse shows. Any effort to collect these strands into a course on 'The Law of the Horse' is doomed to be shallow and to miss unifying principles."[16]

[6] The legislator had by then incorporated changes in the Criminal Code, based on the finding that computer data are not to be considered 'goods' under criminal law. For instance, article 317 Dutch Criminal Code (extortion) was amended to include, besides forcing someone to hand over a 'good', 'to make available information with monetary value in business and trade' ('het ter beschikking stellen van gegevens met geldswaarde in het handelsverkeer' in Dutch). Wet computercriminaliteit, Staatsblad 1993, 33. Since the events leading up to the Supreme Court cases took place prior to this, the legislative change did not affect the case.

[7] HR 13 juni 1995, ECLI:NL:HR:1995:ZD0064.

[8] HR 3 december 1996, LJN ZD0584, NJ 1997, 574 (Computergegevens).

[9] Hoge Raad 31 januari 2012, LJN BQ9251.

[10] Hoge Raad 31 januari 2012, LJN: BQ6575.

[11] Hoge Raad 31 januari 2012, LJN: BQ6575.

[12] Roger Brownsword, 'Regulatory Coherence—A European Challenge' in Kai Purnhagen and Peter Rott (eds), *Varieties of European Economic Law and Regulation: Essays in Honour of Hans Micklitz* (Springer 2014); Roger Brownsword, *Law, Technology and Society: Re-Imagining the Regulatory Environment* (Routledge 2019).

[13] Brownsword, *Law, Technology and Society* (n 12) 134.

[14] Later published as Frank H. Easterbrook, 'Cyberspace and the Law of the Horse' [1996] *University of Chicago Legal Forum*.

[15] Note that this remark has to be placed in a Common Law context where the law primarily consists of case law.

[16] Lawrence Lessig, 'The Law of the Horse: What Cyberlaw Might Teach' (1999) 113 *Harvard Law Review* 501, 502.

This claim has had a profound impact on the emerging field of cyberlaw and I would dare say the echoes of Easterbrook's remarks still resonate today.

Easterbrook's insistence on the value of general principles in teaching the law is understandable. These principles provide coherence[17] – integrity and internal consistency – in the law and make understanding what the law requires of us easier as well as provide legal certainty.[18] Scholars in the emerging field of cyberlaw were quick to respond. Lawrence Lessig, for one, tried to counter Easterbook's claim that focusing on law in cyberspace does not shed insights on unifying principles. He argued that looking at how cyberspace interacts with law we learn something about the "limits on law as a regulator and about the techniques for escaping those limits. [...] By working through these examples of law interacting with cyberspace, we will throw into relief a set of general questions about law's regulation outside of cyberspace".[19] In particular, he draws attention to the fact that cyberspace brings a new modality of regulation, "code", which in his words comprises the hardware and software that make up the Internet.[20] Code has turned out to be very powerful regulator indeed. Leaving aside that the regulative and normative effects of artifacts are nothing new, certainly not for philosophers of technology[21] and science and technology studies (STS) scholars, the message that code/architecture/design in fact regulates human behaviour and as such can be placed in line with law as a regulatory instrument, certainly was a new message for legal scholars.

Is this the kind of general lessons Easterbrook expected in order to count as being on par with 'tort' or 'contract'? No, certainly not. Andrew Murray and others are probably right that Lessig "failed to rebut key indictments in Easterbrook's challenge to the Cyberlaw community, [and that] instead he simply pled 'special circumstances'"[22]. And so the debate has continued and, in fact, this editorial marks just one step in it.

While the discussion alluded to above concerned cyberspace and the attempt to start getting our heads around regulating this novel space through cyberlaw, also other technologies have presented themselves or move from the realm of science fiction to everyday life. Biotechnology and especially genomics made great progress in the second half of the 1990s and entered the academic agenda around the turn of the millennium.[23] Around 2005, nanotechnology came to the fore in legal scholarship, challenging existing distinctions in law once again: should titanium dioxide particles in sunscreens be treated as cosmetics (not penetrating the skin) or drugs (which do)? Nanotechnology also raised new regulatory challenges,[24] including how to regulate nanocarbon (nanotubes, etc.), and whether the 'grey goo' scenario (nanorobots self-replicating to form an ever more consumptive grey goo[25]) called for regulatory intervention. Robotics, artificial intelligence, cloud computing, and blockchain followed suit.

Every time a new technology gains traction, the same questions are asked. What are the ethical and legal issues raised by the technology and how is it regulated in the first place? Many who have been engaged in this kind of quest have experienced the ghost of the Law of the Horse. Each time a new technology is put on the table, it feels like trying to fit the technology in the existing concepts, categories and classifications, while at the same time looking for the X-law.[26] And each time the conclusion seems to be that there is a patchwork of applicable traditional concepts (property, liability, privacy, etc.) that cover part of the issues surrounding the new kid on the block and apart from the generic doctrines there is a patchwork of specific legal frameworks that deal with other aspects. And of course, lacunae, inconsistencies, and undesirable effects are found as well. On occasion, the technologies defy being forced into the existing classifications on which coherence in law is built.

Is this friction with legal coherence specific to new technology or technologies in general? I do not think so. Coherence is (becoming?) an issue elsewhere as well. Society is becoming ever more complex and the traditional concepts and institutions increasingly become inadequate to deal with this complexity. As a case in point, civil law professor Stephanie van Gulijk in her inaugural address at the Tilburg Law School led the audience through the complex network of entities involved in construction and how no one legally is responsible for the safety of buildings (with the collapse of a parking garage at Eindhoven airport in 2017 as an example).[27] The existing legal framework is primarily aimed at bilateral arrangements and is repressive in nature[28] and has difficulties in coping with complex conglomerates of actors that deal with buildings involving novel concepts such as Design Build Finance Maintain & Operate (DBFMO), Design Build Maintain & Remove and DBFMO-Deconstruct, where the involvement of partners may well extend the initial construction phase.

2. Identity crisis

Of course, building requires technology and is technology, but it is not the kind of technology many of us[29] in the field of technology and law have in mind when discussing technology regulation.[30] Our interest is technology with a capital T, so let us return to our common interest. Cyberlaw and the Law of the Horse has been troubling schol-

[17] See Roger Brownsword, 'Law Disrupted, Law Re-Imagined, Law Re-Invented' [2019] *Technology and Regulation 11, 17*; also see Michael Guihot, 'Coherence in Technology Law' (2019) 11 *Law, Innovation and Technology* (forthcoming).

[18] See also Arthur Cockfield and Jason Pridmore, 'A Synthetic Theory of Law and Technology' (2007) 8 *Minnesota Journal of Law, Science & Technology* 39, 496.

[19] Lessig (n 14) 502.

[20] Lessig (n 14) 506.

[21] Langdon Winner, 'Do Artifacts Have Politics?' (1980) 109 *Daedalus* 121. In 1977 already, Winner wrote "[...] the crucial awareness that technology in a true sense is legislation. It recognizes that technical forms do, to a large extent, shape the basic pattern and content of human activity in our time. Thus politics becomes (among other things) an active encounter with the specific forms and processes contained in technology." (italics in the original) Winner, L. 1977. *Of Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought*: MIT Press, 232.

[22] Andrew Murray, 'Looking Back at the Law of the Horse: Why Cyberlaw and the Rule of Law Are Important' (2013) 10 *Scripted* 311.

[23] E.g., Roger Brownsword, WR Cornish and Margaret Llewelyn (eds), *Human Genetics and the Law: Regulating a Revolution* (Hart 1998).

[24] EJ Koops and others, 'Een heel klein artikel met grote gevolgen. Eerste verkenning van nanotechnologie & recht' (2005) 80 *Nederlands Juristenblad* 1554; Bert-Jaap Koops and others, 'On Small Particles and Old Articles - An Exploration of Legal and Regulatory Issues of Nanotechnologies' (Social Science Research Network 2008) SSRN Scholarly Paper ID 1300925 https://papers.ssrn.com/abstract=1300925 accessed 17 April 2019.

[25] Eric Drexler, *Engines of Creation* (Anchor Press/Doubleday, 1990); Michael Crichton, *Prey* (Harper 2002).

[26] We have done so in the Robolaw project (http://robolaw.eu; Ronald Leenes and others, 'Regulatory Challenges of Robotics: Some Guidelines for Addressing Legal and Ethical Issues' (2017) 9 *Law, Innovation and Technology* 1), but have seen similar impulses in other EU and national projects.

[27] Stéphanie van Gulijk, *Circulair en veilig bouwen. Verantwoordelijkheid is geen estafettestokje* (Tilburg University 2019).

[28] Gulijk (n 27) 28.

[29] I will refer to us as the legal scholars interested in technology regulation and associated fields, but maybe the scope of 'us' is much wider, as we will see.

[30] Unless it concerns Smart Homes and Smart Buildings.

ars in 'our' field over the years[31].

On a possible bright side, as Brownsword rightly notes, Easterbrook was wrong in his prediction that cyberlaw would have no future. *Technology law*, and regulation of and by technology, has become a distinct area of scholarship, has research institutes devoted to its study[32], has its own journals[33] and has taken solid ground in teaching as well[34].

The fact that the journal *Law, Innovation and Technology* still publishes papers that refer to the Law of the Horse[35] signals that we are not done yet, or slightly more negatively, that 'we' still suffer an identity crisis. The symptoms of this crisis relate to (in increasing order of severity) our posing of the same questions:

- Is there such a thing as technology law?
- What are the boundaries and scope of 'our' field?
- Who are 'we'?
- How to regulate technology?
- What might Cyberlaw/Robolaw/Ledgerlaw teach?
- What is the role of law in a world that increasingly is driven by technologically spurred innovation?

In the following, I will try to sketch the outlines of the field that I would designate technology regulation and introduce this journal as a means to further this field.

2.1 Regulation

There is a large body of scholarship on all these topics. For instance, Lyria Bennett Moses[36] has argued that technology is not particularly suited as a regulatory target and that technology regulation is the wrong designation of the field. Besides the fact that the term regulation triggers different meanings with different people and is potentially both broader and narrower than law, 'it is generally not the technology that is regulated, but rather a socio-technical landscape'. She is right in this, but for the moment I will maintain technology regulation as a convenient shorthand.

Regulation indeed is a problematic concept. As Karen Yeung has observed, the meaning of regulation is notoriously inexact and highly contested.[37] Within the realm of technology regulation, however, there seems to be agreement that regulation affects the behaviour of individuals and (often) restricts their autonomy and freedom to act. Within this frame, regulation hence is much broader than just command and control rules enacted by the state. Instead, and moving away from the state as sole regulator, a relatively established definition of regulation is Julia Black's: 'Regulation is the sustained and focused attempt to alter the behaviour of others to standards or goals with the intention of producing a broadly identified outcome or outcomes, which may involve mechanisms of standard-setting, information gathering and behaviour-modification.'[38] This clearly brings into scope what Lessig has framed as 'code', architecture or design[39] or what has been commonly known as techno-regulation[40], the "deliberate employment of technology to regulate human behaviour"[41], or as Koops[42] formulates it: "technology with intentionally built-in mechanisms to influence people's behaviour". Markets and social norms also fall within Black's regulatory framework.

Much has been written about techno-regulation, including that there is a whole spectrum of technology-mediated forms of behavioural influence. But there are still many questions regarding the nature and scope of techno-regulation, for instance, is *intent* a necessary component of behavioural modification or do side-effects of design (a CD player cannot play DVDs, although the disks look the same) also count as behavioural modification? Is a wall-socket techno-regulation? If so, what does it regulate? Wall-sockets and plugs do limit my ability to use appliances abroad, but is that regulation as we mean to discuss it? Other characteristics of the spectrum of techno-regulation are also not entirely understood.[43] Techno-regulation incorporates family members as varied as *affordances*[44], *nudges*[45], *persuasive technologies*[46], instrumental techno-regulation enforcing existing legal norms (for instance a speed bump) and intrinsic techno-regulation constituting the norm itself (design choices that limit certain uses of technology) ranking differently on aspects such as (user) choice, (user) awareness and compulsion.[47]

2.2 Technology

The scholarship on (techno-)regulation does not resolve the boundary issue of the field of technology regulation. Although Bennett Moses shows that we should not focus on technology as regulatory targets, but rather at socio-technical systems, that insight only leads us somewhat along the way. Many technology regulation scholars seem tempted to focus on new, emerging or disruptive technologies and the (novel) issues these raise. This provides the gratification of being at the forefront of development and not be bogged down with 'old'

[31] Starting perhaps with Lessig (n 16) 502, but in general, this is what unites much of the works cited in this editorial.
[32] Such as my academic home, the Tilburg Institute for Law, Technology, and Society (TILT), which has been around since 1994.
[33] Such as Law, Innovation and Technology (LIT).
[34] Such as the MA program in Law & Technology run by TILT.
[35] E.g., Guihot (n 17).
[36] Lyria Bennett Moses, 'How to Think About Law, Regulation and Technology: Problems with "Technology" as a Regulatory Target' (2013) 5 *Law, Innovation and Technology* 1.
[37] Karen Yeung, 'Towards an Understanding of Regulation by Design' in Roger Brownsword and Karen Yeung (eds), *Regulating Technologies: Legal Futures, Regulatory Frames and Technological Fixes* (Hart 2008), 90. To some, regulation refers to 'command and control'; rules enacted by government (top-down), enforced by sanctions (e.g., Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (Oxford University Press 1992)). Some scholars restrict the scope of regulation to state intervention, while others include any actor or institution that can regulate human behaviour within the scope of regulation. According to the former, measures introduced by the market, such as the region codes in DVD players (an example of techno-regulation or regulation by design) are, by definition, not forms of regulation, whereas it constitutes regulation according to the latter perspective.
[38] Julia Black, 'Critical Reflections on Regulation' (2002) 27 *Australian Journal of Legal Philosophy* 25.
[39] Andrew Murray and Colin Scott, 'Controlling the New Media: Hybrid Responses to New Forms of Power' (2002) 65 *Modern Law Review* 491.
[40] The term techno-regulation was, as far as I am aware, introduced by Roger Brownsword. Roger Brownsword, 'What the World Needs Now: Techno-Regulation, Human Rights and Human Dignity' in Roger Brownsword (ed), *Global Governance and the Quest for Justice* (Hart Publishing 2004).
[41] Ronald Leenes, 'Framing Techno-Regulation: An Exploration of State and Non-State Regulation by Technology' (2011) 5 *Legisprudence* 143; RE Leenes, *Harde lessen: Apologie van technologie als reguleringsinstrument* (Tilburg University 2010).
[42] Bert-Jaap Koops, 'Criteria for Normative Technology. An essay on the acceptability of "code as law" in light of democratic and constitutional values' in *Regulating Technologies* (Roger Brownsword and Karen Yeung, eds.), Oxford: Hart Publishing 2008, 158.
[43] Bibi van den Berg and Ronald E Leenes, 'Abort, Retry, Fail: Scoping Techno-Regulation and Other Techno-Effects' in M Hildebrandt and AMP Gaakeer (eds), *Human law and computer law* (Springer 2013).
[44] Donald A Norman, *The Psychology of Everyday Things* (Basic Books 1988).
[45] Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (Yale University Press 2008).
[46] BJ Fogg, *Persuasive Technology: Using Computers to Change What We Think and Do* (Morgan Kaufmann Publishers 2003).
[47] van den Berg and Leenes (n 43).

technologies. But the truth is that we seem fairly arbitrary in picking our targets of attention. In fact, technology is a problematic term in itself given its wide scope. Looking at dictionaries and scholarly works we see definitions such as 'technologies comprise the broad range of tools and crafts that people use to change or adapt to their environment'.[48] That makes paper a prominent technology[49], but is it one worth discussing in LIT or this journal? Are we, or should we be interested in discussions about regulating paper or the use of paper? This is a relevant question in determining the scope of the field.

Of course there is regulation regarding paper, for instance regarding the production or disposal of paper, but that seems more the realm of environmental law than of technology law/regulation. Moving a little away from this, we enter the realm of publishing and freedom of expression/speech. With that we enter media law. Which parts of media law and freedom of expression are part of the domain of technology regulation and which are not?

Also, all technologies lose their novelty sooner or later. At what point are they no longer of interest to us? An intuitive, or maybe tautological, answer would be, when they no longer raise legal disruptions or significant legal frictions. However, technologies tend to develop, or rather are being developed by humans, and acquire new features and functions. Hence it is not the case that a technology on a larger scale (e.g., paper) per se is out of interest for technology scholars, but rather new applications or uses require or draw attention. Rarely do we encounter entirely new classes of technologies. Steam engines, computers, and the Internet surely are major new technologies, but arguably most social media, for instance are novel incarnations of discussion fora of old.

Another question is what the appropriate scale of a technology is to merit our attention. Paper could be the target of choice, but so do political speech in writing, or advertisements in magazines. All levels can be studied and regulated. Whether they do will largely depend on the legal frictions induced by the use of technology.

2.3 The 'we' in technology regulation

As part of any proper identity crisis, reflections on what we are, and why, are inevitable. Andrew Murray gave a wonderful keynote address[50] at the 2013 Bileta[51] conference that bears witness to precisely this point. The backdrop of his presentation is much like the present editorial, looking back at 'The Law of the Horse' and what 'regulatory cyberlawyers'[52] have to offer to define an agenda for the future.

In his struggle with rebutting Easterbrook, Murray makes a number of observations that should sound familiar to many who consider themselves in the genus 'regulatory technology lawyer' (techlawyers for short) as I, for the time being, would want to call the legal scholars working in the field of technology regulation.

Cyberregulatory or cybergovernance theorists are convinced that digitisation and cyberspace are special (more on exceptionalism below). Murray explains how he and others in their analysis employ 'academic heavyweights – Michael Foucault, Bruno Latour, Niklas Luhmann – and a number of legal academic cruiserweights – Gunther Teubner, Cass Sunstein, Neil MacCormick – to make our point that Cyberspace and cyber-regulation is special. The problem is we continue to use the language and rhetoric of social policy, sociology and political philosophy, rather than the language of law or regulation.'[53] To then conclude '[w]e become social scientists not lawyers', and as a colleague told Murray, 'what you do isn't law'[54].

These observations do resonate with me at least. But I think the observation that cyber/techlawyers move beyond the law is precisely the point of what they do. They acknowledge that cybergovernance and technology regulation require multidisciplinarity and that its scholars should be versed in more than just the law. Black letter law is less essential in technology regulation than in more traditional legal fields because there is more to regulation than law and because technology has the potential to disrupt classical legal concepts and institutions and sometimes does. Understanding 'the interplay between law and technology and the ways technology can have a substantive impact on individuals and their legal interests apart from the technology's initial intended use'[55] becomes essential in this respect.

Hence, it should not come as a surprise that the field of technology regulation is populated by others than legal scholars. And as is the case in many realms within academia, the field is heavily balkanized. Already mentioned are philosophers of technology and STS scholars as members of the broad family of technology explorers. They have their own (respective!) perspectives and methodologies, but are generally interested in the relation between technology and moral concepts.

Next to the philosophical branch of the family, there is also an economic branch. Anna Butenko and Pierre Larouche[56] have pointed out that in the legal literature at the interplay between innovation and law, there are two related fields of study that are not commonly brought together. One is law and economics as it concerns innovation, which is largely examining the effects of innovation, and the mechanisms to stimulate innovation in a market economy. The second is law and technology, which conflates largely with the area we have been discussing above, and which, according to Butenko and Larouche, often investigates either technology as a regulatory focus and rationale for regulating, or regulation by technological means. Both fields deal with the regulation of innovation, but are usually separate disciplines.[57] I see both fields of study as part of the wider field of technology regulation that I am tentatively framing in this editorial.

The question of who else belongs to the family of technology regulation or who else we need to build a coherent theory of technology regulation is an open question. I hope this journal will contribute to answering this question.[58]

[48] Bert-Jaap Koops, 'Ten Dimensions of Technology Regulation. Finding Your Bearings in the Research Space of an Emerging Discipline' in Morag Goodwin, Bert-Jaap Koops and Ronald Leenes (eds), *Dimensions of Technology Regulation* (Wolf Legal Publishers 2010).

[49] And indeed Mireille Hildebrandt has written interesting works about paper technology, for instance in relation to law. See for instance, Mireille Hildebrandt, 'Technology and the End of Law' in Erik Claes, Wouter Devroe and Bert Keirsblick (eds), *Facing the Limits of the Law* (Springer 2009).

[50] Murray (n 12).

[51] The British and Irish Law, Education and Technology Association

[52] Murray (n 22) @314 distinguishes between regulatory cyberlawyers (like himself) and 'applied cyberlawyers' while admitting that certainly the latter term is not ideal.

[53] Murray (n 22) 314.

[54] Murray (n 22) 314.

[55] Cockfield and Pridmore (n 18) 503.

[56] Anna Butenko and Pierre Larouche, 'Regulation for Innovativeness or Regulation of Innovation?' (2015) 7 *Law, Innovation and Technology* 52.

[57] Not so at The Tilburg Law School, where, TILEC (law and economcs) and TILT (law and technology) have been united in the new department of LTMS.

[58] One of the panels at the *TILTing* 2019 conference was devoted to questions such as these, and likely we will hear from the panelists (Michael Guihot, Lyria Bennett Moses, Roger Brownsword, Bert-Jaap Koops, Han Somsen, Ronald Leenes) sometime soon.

2.4 What technology regulation might teach

In discussions with others and even to earn our spot under the sun, discussions about the boundaries of the field are relevant, but the subject of our field is more so.

The central concerns could be phrased as: what (new) issues are or could be created due to technology development and if so, how should we regulate this technology (instance/use)?

All too often, people, scholars, policy makers, industry and interest groups, jump to the conclusion that regulation is required, often conveniently accompanied with recommendations as to what that regulation could or should look like, opening the door widely to regulatory capture. The 'flawed law syndrome' is very prevalent in technology circles.[59] Regulating before understanding what is at stake (the particular technology), what the issues are, for whom, why and what is wrong or missing in existing regulation, if anything, is not the proper starting point. But how to systematically go through the steps and questions that do make sense is difficult without proper methodologies and frameworks. We do have some frameworks or theories that warrant further reflection and development such as Arthur Cockfield and Jason Pridmore's 'Synthetic Theory of Law and Technology',[60] which will be briefly discussed below, and Roger Brownsword's 'Re-invention of Law' in view of the technological disruption of law and legal reasoning[61].

Supposing that we have answers to the non-trivial questions regarding issues, stakeholders, values, etc., the questions become whether, when and how to regulate. Here we see much scholarship and also clear (implicit) differences between scholars and their cultures. From a continental European perspective, regulation enacted by the EU or national legislators is a legitimate starting point. We live in an area with a regulatory-instrumentalist mindset as Brownsword calls this approach to regulation.[62] There generally are regulatory purposes and policies following from public interest, social justice, or market failure that call for regulation and guide its direction. Coming from a law and economics perspective, or from the US regulatory mindset, this approach to governing society is less obvious. In these realms, addressing market failure is a legitimate reason to interfere through regulation; other reasons of public interest (who defines these?) far less so.

Regarding the timing of regulation, we have clearly learned lessons. The law is said to always lag behind technological development and again significant scholarship exists here.[63] The pacing problem or regulatory connection[64] is well known and so is what has become known as the Collingridge dilemma —"When change is easy, the need for it cannot be foreseen; when the need for change is apparent, change has become expensive, difficult, and time-consuming."[65]

There is also reflection and scholarship on policy heuristics (i.e. one-liners) devised during the late 1990s as a way to guide legislators in coping with the Internet and other ICT developments.[66] Included were classic notions such as, 'what holds offline, should hold online as well' and regulate through technology-neutral regulation. Some of these heuristics were clearly based on maintaining a congruence between rules in the real world and the rules in cyberspace, which for the sake of legal certainty should be recognizable for cybernauts. This idea had its flaws at the beginning of the Millennium already, but one may certainly wonder whether this congruence is maintainable and desirable in 2019. It presupposes an off-line experience prior to entering cyberspace. Current teenagers lack this pre-cyberspace experience and do not so much have to make the move from atoms to bits.[67] They, for instance, have hardly have experienced music and other content in forms sold in brick-and-mortar shops. The excludability and rivalry characteristics of physical carriers protected by copyright are almost alien to people born digital for whom that song is always just one click away.

2.5 Is technology regulation destined to lead to bad law?

Chris Reed, in discussing the substance or way technology is regulated notes that technology regulation moves in particular directions, leading to 'bad law'.[68] He argues that "[T]here is a clear trend for law and regulation, particularly in cyberspace, to become increasingly precisely specified. The perceived benefit of this approach, increased certainty as to compliance, may be illusory. Over-complex laws have serious disadvantages, particularly a greatly weakened normative effect, and problems of contradiction and too-frequent amendment."[69] Although this seems plausible enough as an argument, I am not convinced by his explanation nor by the examples he gives, but that is for another occasion.

Reed does rightly point at a bigger underlying problem, regulatory disconnect and its cousin regulatory failure. He seems to suggest that technology regulation, in part due to wrong choices by the regulator on the dimensions 'vagueness-certainty', 'opaqueness-clarity', and 'complexity-simplicity', is almost destined to lead to regulatory failure. One of the problems here is that the notion of regulatory failure is underdeveloped. Failing, but compared to what? Policy goals, for instance. But what if these are unclear. In a study of one of the cases that could qualify as regulatory failure, the European cookie regulation, analysis of the Dutch policy and legislative debate reveals that there is no political consensus regarding the policy goals.[70] In view of this disagreement, the regulation maybe does what it is supposed to do given unclear goals.

Reed raises a number of relevant questions that warrant further explo-

59 Ronald Leenes, 'Regulating New Technologies in Times of Change' in L. Reins (ed), *Regulating New Technologies in Uncertain Times* (TMC Asser 2019).

60 Cockfield and Pridmore (n 18).

61 Brownsword (n 17)

62 Brownsword (n 17) 15.

63 E.g., Lyria Bennett Moses, 'AGENTS OF CHANGE: How the Law Copes with Technological Change' (2011) 20 *Griffith Law Review*, Vol. 20, No. 4, 764; Roger Brownsword and Morag Goodwin, *Law and the Technologies of the Twenty-First Century: Text and Materials* (Cambridge University Press 2012).

64 E.g., in Brownsword and Goodwin (n 65); Diana Bowman, 'The Hare and the Tortoise: An Australian Perspective on Regulating New Technologies and Their Products and Processes' [2013] *Innovative Governance Models for Emerging Technologies* 155; Roger Brownsword and Han Somsen, '"Before We Fast Forward – A Forum for Debate"' (2009) 1 *Law, Innovation and Technology* 1.

65 The quote comes from Evgeny Morozov, 'The Collingridge Dilemma' in J Brockman (ed), *This explains everything* (Harper Perennial 2013). The original concept is discussed in David Collingridge, *The Social Control of Technology* (Frances Pinter 1980).

66 Bert-Jaap Koops and others (eds), Starting Points for ICT Regulation: Deconstructing p[r]Evalent Policy One-Liners (TMC Asser 2006).

67 Nicholas Negroponte, *Being Digital* (Vintage Books 1996).

68 Chris Reed, 'How to Make Bad Law: Lessons from Cyberspace' (2010) 73 *The Modern Law Review* 903; Chris Reed, *Making Laws for Cyberspace* (Oxford University Press 2012).

69 Reed, 'How to Make Bad Law: Lessons from Cyberspace' (n 56) 903.

70 Ronald Leenes, 'The Cookiewars: From Regulatory Failure to User Empowerment?' in Marc van Lieshout and Jaap-Henk Hoepman (eds), *The Privacy & Identity Lab* (The Privacy & Identity Lab 2015).

ration. The rules/standards/principles debate touched upon in his work clearly is a centerpiece, but not only for cyberlaw. The amount of judgment left to regulatees is a fundamental question that relates to comprehensibility, 'compliability', etc. But we should also take into account that not all regulatees are alike. Kagan and Scholz[71] provide some guidance in this respect. They distinguish *amoral calculators*, who make cost-benefit assessments and then determine whether to comply with the rules or not. The content of the rules does not matter, the fines do. A different group is that of the *political citizens* who do not follow certain rules as a matter of civil disobedience. And then there are the *organisationally incompetent*. These are the ignorati, they do not know or understand the rules. We need to be aware that all three types operate in the same space and we should not assume too easily that the rules are inadequate.

As part of the regulatory toolbox that goes beyond traditional law, 'smart regulation' or 'responsive regulation'[72] and 'participatory governance',[73] should be mentioned. They may contribute to the regulatory innovation[74] necessary to address the regulatory challenges of complex technological developments that have broad and systemic implications for many social processes.

3. Back to the Horse

I started my recount of the field of cyberlaw with 'The Law of the Horse'. In the meantime other animals have joined the herd as metaphors for the field of technology regulation or subfields thereof.

Michael Guihot[75] attempts to outline the boundaries of the broader domain by defining technology law as a relatively coherent field, similar to environmental law or health law, shedding light on the complex interaction of participants, pressures and regulatory responses in view of technology development. His paper contains an image where technology law sits in the middle of five core legal frameworks: contract, property, privacy, tort, and competition law. The image shows Technology Law as the face of a fox in-between the circles that depict these five fields. Guihot pledges the field to be called *technology law* instead of *technology regulation* if it seeks to be included in the canon of legal fields. If that is the aim then he may have a point.

I do, however, think that inclusion in the canon is not the sole ambition of the field. In my view the field is not only a body of legal knowledge, but also a field that studies how to regulate technology or socio-technical assemblages. It not only provides guidance on *what is*, but also about *what might be*. That may warrant seeing technology law in the form of the codified legal knowledge (statutes and case law) as a potential subfield of technology regulation next to theory and methodologies suitable for regulators.

Coming from a background in mathematics, Bert-Jaap Koops has provided a starting point to define what he then termed the relatively new field of technology regulation by spanning it up in ten dimensions.[76] As he remarks, most people have great difficulties in imagining anything beyond three or four dimensions and hence comprehending what exactly the space is spanned by the ten dimensions, his model at least allows people to 'see where you are, or where you want to go, in the technology regulation space, all you have to do is determine the coordinates along ten different dimensions.'[77] The model can be summarized by noting that it entails three regions: regulation, with dimensions of knowledge, normative outlook, and type of regulation; the technology region, with technology type, innovation, place, and time as subdimensions; and research region, spanning discipline, problem and frame. This brief overview already shows that many different types of technologies, modes of regulation and types of research can find home in this framing of technology regulation.

Arthur Cockfield and Jason Pridmore have outlined a synthetic theory of law and technology that can inform law and technology analysis.[78] They want to move away from a 'traditional compartmentalized approach that scrutinizes niche doctrinal areas of technology law (e.g., patent law or copyright law) or the impact of specific technologies (e.g., cyberlaw, new media, or biotechnology)'[79] and instead look at the broader implications of technology on law. Their theory prescribes two steps. In the first it needs to be established whether technological change undermines traditional interests by identifying the traditional interest protected by law employing traditional doctrinal legal analysis and determining whether the interest is being duly disrupted by technological change. If technological disruption indeed is the case, a more contextual analysis is required. This analysis scrutinizes the broader context of technology change and its potentially unanticipated adverse outcomes for the traditional interest as well as for other protected interests the law seeks to protect. It then seeks to find legal solutions to protect the traditional interest that are less deferential to precedent and traditional doctrine.[80] This framework places the analysis of the intersection of law and technology squarely within a value/interest context. Instead of trying to fit in technologies within existing legal concepts and frames, it calls for taking a step back and re-evaluating underlying values to then determine new balances of interests and regulatory interventions to achieve these. At first glance this may resemble teleological reasoning as we have seen in the Dutch cases at the start of this paper; it is important to note that Cockfield and Pridmore call for a study of the technology in question and its further consequences for individuals and groups. This goes beyond classical teleological interpretation by courts.

Besides grand perspectives on technology law or technology regulation, there are also efforts to define subspaces. Han Somsen, for instance, has pointed at the inadequacy of environmental law in dealing with radical technologies and calls for a new regulatory effort and maybe even subfield.[81] Environmental law in his view aims more at environmental improvement (facilitating the cleanup of polluted rivers allowing salmon to return) than at environmental enhancement (genetically modifying salmon to cope with warmer waters due to global warming). 'Environmental enhancement, then, is an intentional technological intervention in the environment in pursuit of human interests, needs or rights which takes place outside the confines of such pre-agreed environmental base-lines.'[82] A base-line of environmental law is 'yes, unless', which may not be adequate to cope with radical climate engineering efforts (like colouring the ocean white to help lower global temperatures). He suggests we need reg-

[71] R Kagan and J Scholtz, 'The Criminology of the Corporation and Regulatory Enforcement Strategies' in J Hawkins and J Thomas (eds), *Enforcing Regulation* (Kluwer 1984).
[72] Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (Oxford University Press 1992).
[73] Archon Fung and Erik Olin Wright, 'Deepening Democracy: Innovations in Empowered Participatory Governance' (2001) 29 *Politics & Society* 5.
[74] Julia Black (ed), *Regulatory Innovation: A Comparative Analysis* (Elgar 2005).
[75] Guihot (n 17).
[76] Koops (n 48).
[77] Koops (n 48) 312.
[78] Cockfield and Pridmore (n 18).
[79] Cockfield and Pridmore (n 18) 512.
[80] Cockfield and Pridmore (n 18) 505.
[81] Han Somsen, 'Towards a Law of the Mammoth? Climate Engineering in Contemporary EU Environmental Law' (2016) 7 *European Journal of Risk Regulation* 11.
[82] Somsen (n 81) 119.

ulation on novel insights in values and capabilities of technologies. Although the scope and outlines of such regulation are left in the dark, Somsen has come up with a catchy name for this novel branch to environmental and technology law, *The Law of the Mammoth*.

Another notable effort to delineate a relevant technology subfield comes from Ryan Calo.[83] He places a law of robotics[84] next to cyberlaw as species of technology law. He argues that cyberlaw warrants being seen as a separate field and thus escaping Easterbrook's 'curse' because its 'introduction into the mainstream require[d] a systematic change to the law or legal institutions in order to reproduce or if necessary displace, an existing balance of values.'[85] Although robots share many qualities of the products of Cyberspace, embodiment, emergence and social valence makes them different with profound impact on 'a wide variety of contexts: criminal law and procedure, tort, intellectual property, speech, privacy, contract, tax, and maritime law, to name but a few'.[86] He goes on to show how frictions surface and concludes that robotics warrants an exceptionalist treatment in its own body of law. We see the urgency of changes along these lines around us. For instance, '[I]n the resolution from February 2019 on a comprehensive European industrial policy on artificial intelligence and robotics, the Parliament upheld its somewhat more proactive position on adopting new regulation in the field – it welcomed the Commission's initiative to create the Expert Group on Liability and New Technologies, but "regretted that no legislative proposal was put forward during this legislature, thereby delaying the update of the liability rules at EU level and threatening the legal certainty across the EU in this area for both traders and consumers'.[87]

There are likely many more efforts out there, and I think it is safe to say we do not have clearly established frames for 'the' domain or its subdomains.

4. The road ahead

In the brief overview I hope to have shown that the cyberhorse and other animals of cyberspace have not died (yet) and that many basic questions in the field of technology regulation are still not adequately answered. On the contrary. When a new technology presents itself, we witness new incarnations of the Law of the Horse. Amongst others, we see this regarding robotics, genomics and AI. Legislators and policy makers want to know what these phenomena legally are and whether or not (specific) regulation is required in coping with the changes the technologies induce. A first reflex then is to look for the law regulating this specific technology. What we find is that parts of the legal issues are covered by existing law (contract, tort), partly there may be specific provisions in these domains (bolted on existing concepts), partly there may be specific regulation, and there likely are undesired effects and regulatory gaps. Disruptive technologies are likely to lead to regulatory disconnect.

We need a more thorough theoretical, methodological and practical foundation to get a proper grip on technology and regulation. There is an urgency in doing so because the stakes are high, for instance because power is being concentrated in the hands of a limited number of (US and in the near future Chinese) players, and technology is being developed at a rapid pace. Some of the technologies have the potential to become Socially Disruptive Technologies (SDTs).[88] These technologies 'transform everyday life, social institutions, cultural practices and the organisation of the economy, business and work'.[89] Historical examples include the printing press, the steam engine, electric lighting, the computer, and the Internet.[90] Current candidates to receive the title of SDT include robotics, (general) Artificial Intelligence, gene editing, neurotechnology, and climate engineering. These examples seem to be technologies, but are in fact socio-technical systems. They have developers, creators, producers, users, affected non-users, constraints, requirements, consequences, etc. In most cases, there are many stakeholders involved and the resulting assemblages cross all sorts of boundaries, geographical (the machinery powering an AI in a car on the Dutch road may actually reside in the US, or more likely, somewhere in the Cloud) and hence jurisdictional, doctrinal, disciplinary, and so on.

The traditional coherence-based legal processes have difficulty keeping up with the changes induced by innovation and technology development. As Brownsword formulates it "coherentism presupposes a world of, at most, leisurely change. It belongs to the age of the horse, not to the age of autonomous vehicles"[91]. I think the field of technology regulation as broadly outlined above should strive to do better. Scholars in this young field do acknowledge the interactions between technologies, risks, and their regulation[92], or the interplay between regulation, technology and normative notions and values[93].

With the launch of the *Technology and Regulation* journal, the editors hope to offer a place to move the field forward. But why do we need a new journal for that, you may wonder?

4.1 Information wants to be free

Some of us are old enough to remember the pre or early Internet days. I clearly remember the telnet connections I had with colleagues in the US and how excited I was when I got Gopher running to browse the infosphere only just before Tim Berners-Lee gave us the World Wide Web. The mantra in those days was 'information wants to be free' and the development of the Internet and the Web took shape in this spirit. Search engines started appearing, making finding information scattered over the web easier and placing information more and more at our fingertips. Google's original 1998 mission statement was 'to organize the world's information and make it universally accessible and useful'.[94] Free, grass-roots initiatives further provided valuable information that has changed the world. Think of the Internet Movie Database (IMDb)[95], Wikipedia[96] and numerous general and specific information sources that many of us consult on a daily basis. Many of them are free of charge to users and maintained by donations and/or advertising.

In the meantime scholarly work to a large extent is not available to everyone free of charge, also not in the Internet sense of free (paid for by advertisements). Many journals are owned and run by commercial publishers that charge fees for their services. Publishers offer many

83 Ryan Calo, 'Robotics and the Lessons of Cyberlaw' (2015) 103 *California Law Review* 513.
84 Too bad no animals were introduced in this effort.
85 Calo (n 83) 552.
86 Calo (n 83) 553.
87 Rowena Rodrigues, *'Sienna D4.2: Analysis of the Legal and Human Rights Requirements for AI and Robotics in and Outside the EU"* (2019).
88 Philip Brey, 'Ethics of Socially Disruptive Technologies'.
89 Brey (n 72).
90 Brey (n 72).
91 Brownsword, (n 17) 10.
92 Guihot (n 17).
93 Cockfield and Pridmore (n 18).
94 https://www.theguardian.com/technology/2014/nov/03/larry-page-google-dont-be-evil-sergey-brin last consulted 12 May 2019.
95 IMDb's history predates the Web as a list on Usenet. It moved to the web in 1993. IMDb currently is owned by Amazon.
96 Launched only on January 15, 2001 https://en.wikipedia.org/wiki/Wikipedia, last consulted 12 May 2019.

useful services, such as facilitating quality control, offering reputation and brand, typesetting, distribution, storage and archival, monitoring and notification, etc. But this comes at a price. These costs are either borne by readers (subscription fees or one-off charges to access an article) or authors (article processing fees, etc.). And while this is not problematic for many scholars and other interested parties, this is certainly not the case for everyone in academia and beyond.[97]

The traditional subscription-based model is problematic due to declining budgets at universities. Choices have to be made, by libraries, departments and individuals, hardly anyone can maintain access to all relevant sources. For instance, Tilburg University, which lacks science departments, does not have subscriptions to ACM and IEEE journals. Yet, I have had the need to access these journals for my work in the European Commission's FP6/FP7/H2020 projects I have been engaged in. Of course there are workarounds to this issue, but I have seen the effects of limited access. And yet, Tilburg University is a relatively wealthy university. How do less fortunate researchers cope with these costs?

The Open Access (OA) funding models that aim to replace or complement the traditional model also have their issues. Researchers can include items in their budgets for Open Access Gold publication charges when applying for national or European grants (such as European Research Council grants). But many researchers do not have such projects with specific budgets for OA publication. This leads to tough choices within departments and schools, producing new have and have-nots.

This new journal, *Technology and Regulation*, offers an alternative. The costs of running the journal will be borne by the Department of Law, Technology, Markets, and Society (LTMS) embedded within the Tilburg Law School, facilitated by a grant from Tilburg University. We believe LTMS has the mass to perform the many tasks involved in running a professional, high-quality, peer-reviewed journal at zero costs for readers and authors.[98]

4.2 Where the rubber meets the road

Technology and Regulation is an international journal of law, technology and society, with an interdisciplinary identity. It will disseminate original research on the legal and regulatory challenges posed by existing and emerging technologies (and their applications) including, but by no means limited to, the Internet and digital technology, artificial intelligence and machine learning, robotics, neurotechnology, nanotechnology, biotechnology, energy and climate change technology, and health and food technology. As discussed above, regulation is conceived broadly to encompass ways of dealing with, ordering and understanding technologies and their consequences, such as through legal regulation, competition, social norms and standards, and technology design (or in Lessig's terms: law, market, norms and architecture).

Technology and Regulation aims to address critical and sometimes controversial questions such as:

- How do new technologies shape society both positively and negatively?
- Should technology development be steered towards societal goals, and if so, which goals and how?
- What are the benefits and dangers of regulating human behaviour through technology?
- What is the most appropriate response to technological innovation, in general or in particular cases?

It is in this sense that *Technology and Regulation* is intrinsically interdisciplinary: it is premised on the understanding that legal and regulatory debates on technology are inextricable from societal, political and economic concerns, and that therefore technology regulation requires a multidisciplinary, integrated approach. Through a combination of monodisciplinary, multidisciplinary and interdisciplinary articles, the journal aims to contribute to an integrated vision of law, technology and society.

Technology and Regulation invites original, well-researched and methodologically rigorous submissions from academics and practitioners, including policy-makers, on a wide range of research areas such as privacy and data protection, security, surveillance, cybercrime, intellectual property, innovation, competition, governance, risk, ethics, media and data studies, and others.

The journal opens with this editorial and two invited papers. Regular papers in Technology and Regulation are double-blind peer-reviewed and completely open access for both authors and readers. It does not charge article processing fees. Technology and Regulation is an online journal with rolling publication. The journal publishes papers as fast as the editorial team and reviewers can process them. The published papers are available as self-contained PDFs with all the relevant elements, such as page numbers, DOI, ISSN, etc.

Our Editorial Board Committee[99] comprises a distinguished panel of international experts in law, technology, and society across different disciplines and domains. I would like to thank Daan Rutten and Charles Dybus from Tilburg University for their help in launching the journal, as well as Roger Brownsword and Mark Coeckelbergh for their invited contributions.

Here we go, let the debate begin!

[97] We do seek to also reach policy makers and others. The situation for them might even be worse than for academics.

[98] We do need, and solicit, your help though. We need reviewers and editorial board members covering various sub-domains. Please let us know if you want to be of assistance.

[99] https://techreg.org/index.php/techreg/about/editorialTeam