Computational legalism and the affordance of delay in law

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Abstract

Delay is a central element of law-as-we-know-it: the ability to interpret legal norms and contest their requirements is contingent on the temporal spaces that text affords citizens. As computational systems are further introduced into legal practice and application, these spaces are threatened with collapse, as the immediacy of 'computational legalism' dispenses with the natural 'slowness' of text. In order to preserve the nature of legal protection, we need to be clear about where in the legal process such delays play a normative role and to ensure that they are reflected in the affordances of the computational systems that are so introduced. This entails a focus on the design and production of such systems, and the resistance of the ideology of 'efficiency' that pervades contemporary development practices.

Keywords: Affordance, efficiency, legality, computational legalism, artificial intelligence

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Introduction

A real and primary affordance of text is the delay between representation, understanding, and action, a space that might be referred to as a 'hermeneutic gap'.[1] In the legal realm, this gap exists between the text that constitutes a legal norm and its instantiation or reification in the world by means of behavioural change. In order for some mandated action to take place, for a rule to be applied, there is necessarily a space in which interpretation takes place — as Bańkowski and MacCormick note, each application of a rule is also an interpretation of it.[2] Within that space, time necessarily passes. Simplistically put, the legal subject considers what the text means for her, how the vocabulary used applies to the situation, and what the resulting interpretation means for how the law requires her (not) to act.[3]

None of this is immediate, or a given. The meaning or purpose of the rule will often be arcane to the citizen, its precise relevance to her being obscured by her exclusion from the 'form of life' of the law and the often confusing 'lawyer-speak' that it comprises.[4] Despite this, the language of law does to an extent overlap with the language of ordinary life — lay citizens often talk of rights and what is legal and illegal — and there is at least the opportunity for the citizen to learn something of the legal form of life and to try to make sense of it, consulting an expert if it seems necessary to have something explained or resisted via litigation (who themselves will sit in a kind of extended hermeneutic gap as they prepare the case).

In this paper I discuss the idea of consciously affording slowness or delay in computational systems, a goal that is anathema to their contemporary processes of production and indeed to their very nature. I start by sketching some ideas about the role of interpretation in law, before considering some existing work on the role of delay in technical architectures. The central idea is that in order to facilitate the types of interpretation and evaluation that law-as-we-know-it depends upon, we will need to think about how and where consciously to build delay into machines that come to be involved in the legal process. Computation does of course already play various roles within the practice of law, and at myriad intersecting points. There is a complex matrix of actors, forms of technology, and purposes to which they are put, the roles played by each varying depending on the point at which they enter into the legal process.[5] The goal of this paper is not to profile these configurations, but to highlight some important themes that ought to be borne in mind both by those who design computational systems destined for the legal world and by those who decide when, where, how and *why* they will be deployed there.

Legal text and hermeneutics

The passive 'physics' of legal text necessarily entails the latency described above; looked at from the opposite direction, we can say that text *affords* the reader *delay*, which in turn affords other things such as space for contemplation, comprehension, and the opportunity to interpret the text.[6] The text, by itself, can have no regulative effect on behaviour, even if it does have some kind of *legal* effect within the form of life of the law. The focus of the citizen

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[1] Laurence Diver, 'Law as a User: Design, Affordance, and the Technological Mediation of Norms' (2018) 15(1) SCRIPTed 4, pp. 33-34. A real affordance is one that exists regardless of whether or not it is perceived.

[2] Zenon Bańkowski and Neil MacCormick, 'Legality without Legalism' in Werner Krawietz and others (eds), *The Reasonable as Rational? On Legal Argumentation and Justification; Festschrift for Aulis Aarnio* (Duncker & Humblot 2000) p. 194.

[3] Of course, this assumes the motivation and ability to identify the relevant law, which is not a given and which may be subject to certain lay heuristics about what the law is and ought to be (on which see Arden Rowell, 'Legal Knowledge, Belief, and Aspiration' (2019) 51 Arizona State Law Journal 225). In any event, the contest of a legal norm ex post necessarily entails reliance on a hermeneutic gap arising at some point in the process.

[4] Lucas D Introna, 'Hermeneutics and Meaning-Making in Information Systems' in Robert D Galliers and Wendy L Currie (eds), *The Oxford Handbook of Management Information Systems: Critical Perspectives and New Directions* (Oxford University Press 2011) p. 237.

[5] For example, the creation and management of documents by a paralegal is normatively speaking a world away from a litigator's use of a prediction of judgment algorithm or the coding of contractual norms that are self-enforcing. This is true both in terms of the technologies involved and the normative implications for law as an enterprise.

[6] On affordances generally, see Donald A Norman, *The Design of Everyday Things* (MIT Press 2013); James Gibson, 'The Theory of Affordances' in Robert Shaw and John Bransford (eds), *Perceiving, Acting, and Knowing: Toward an Ecological Psychology* (Lawrence Erlbaum Associates 1977).

is unlikely, however, to be on what the particular constellation of legal effect is at any given moment. Instead, the apposite question for her is simply 'What does the law require of me?', part of the answer to which is contained in, but cannot be directly imposed by, the legal text. The hermeneutic gap provides a space within which the citizen can think about what the answer is, through an iterative and multi-layered process of interpretation. As Ricoeur suggests, we ascertain the meaning of a text first through a 'hermeneutics of faith', taking its terms and the reality it presupposes at face-value. We then (ought to) proceed to a deeper level of interpretive interrogation, the 'hermeneutics of suspicion', where we ask what the reality is that the text presupposes, in order to uncover the 'relationships of power, conflicts, and interests implicated in it'.[7]

This 'double hermeneutics' of faith and suspicion is especially relevant to the idea of legal contestation in a democracy. The hermeneutics of faith provides a naïve reading of the text, one that accepts the text at face-value — this is similar to a *legalistic*, textualist reading of the law, and is at odds with the kind of autonomous and reflexive engagement with the deeper implications of the text envisaged by the aspiration of *legality* (I discuss these concepts further below). A deeper engagement with the text is reflected in the hermeneutics of suspicion, where the reality that the text presupposes is made explicit and is questioned, implying a more reasoned consideration of the text and thus our response to it (be that acquiescence, disagreement, contestation, confusion requiring expert help, etc.). The legal subject (or her representative) draws back the veil of the text in order to see what lies behind.

Although too much of the hermeneutics of suspicion can tend toward a cynical reading of the text,[8] in principle this is no bad thing with respect to the wielding by the state of its monopoly on violence. If suspicion was not warranted and all that was required was faith, there would be no need for a deeper interrogation and no possibility of, or need for, contestability: we could proceed on the basis of the text as it appears. Indeed, this is the basis of the ideology behind stronger forms of legalism, and an ontological feature of *computational legalism*, discussed below. If such naïvety were acceptable, the automation of law and the attendant collapse of the hermeneutic gap that would result would be not just straightforward but also desirable, since there would be no value in wasting time by retaining an opening in which to consider what would be a foregone conclusion.

Spaces in time — delays in what might otherwise be an instantaneous process — are an important part of facilitating the hermeneutics of suspicion. Before the emergence of computation, the delay afforded by text to its human interpreters hardly required to be pointed out; the 'ontological friction'[9] of the medium made it a simple fact, and indeed a deeply-held assumption to which no alternative was imaginable.[10]

The sheer obviousness of text's 'friction' should not blind us to the fact that the affordance of delay is not a given. Human societies have already seen significant shifts in the way text affords interpretability: under scribal culture, where texts were copied by hand and were thus expensive and scarce, the geographical and temporal reach of a text was limited by its being in the hands of (religious) elites who controlled access to it. Religious institutions interpreted the texts on behalf of an illiterate public, leaving little or no space for contemplation and thus any 'suspicious' resistance on the part of those subject to those interpretations (and the consequences of failing to obey them). With the advent of the printing press and the opportunity for ordinary citizens to possess texts and to ponder their meaning — to reap the fruits of the hermeneutic gap — the very literal suspicion that led to the Protestant Reformation was made possible.[11]

The novel affordances introduced by the new technology of the printing press were not givens. Similarly, as we develop and introduce new computational technologies, we

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[7]   Introna (n 4) p. 248; Paul Ricoeur, *Freud and Philosophy: An Essay on Interpretation* (Denis Savage tr, The Terry Lectures Series, Yale University Press 1977) p. 32 et seq.

[8]   Introna (n 4) p. 251.

[9]   Luciano Floridi, *The Ethics of Information* (Oxford University Press 2013) p. 231 et seq.

[10]   Katherine Hayles, 'Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis' (2004) 25(1) Poetics Today 67.

[11]   Elizabeth L Eisenstein, *The Printing Revolution in Early Modern Europe* (2nd edn, Cambridge University Press 2012).

must be sensitive to the shift in affordance that this will necessarily bring about. This is true in terms of identifying both what those shifts in fact *are*, and what they *mean* for the institutions, such as the law, whose character is based to whatever extent on the configuration of affordance that went before.[12]

Legality

As suggested above, the idea of being suspicious of a text relates to the aspirational concept of *legality*. Legality views legal interpretation not as a coldly mechanical operation, but as something involving reasoning and reason-giving by legal subjects who are respected as human beings that have dignity, autonomy and agency.[13] This points to the existence of a space for contemplation and reasoned action that lies somewhere between heteronomy and anarchism, where the individual is respected enough to consider the rule beyond a bare acceptance of its terms. This in turn implies the possibility of contesting those terms — of arguing about what they *ought* to mean in a particular temporal and social context, and what rights and duties are thereby implicated.

The ability to argue, to contest, requires the opportunity for agonistic engagement — adversarial debate that enables contrasting points of view to be ventilated and fruitful compromise thereby to be achieved,[14] which in turn implies respect for individuals whose interpretations have reasonable differences. Ultimately, of course, the flexible space that legality represents is not without limit, and the existence, nature, and scope of a *legal* truth lies with the authority certified to determine it within the legal form of life, namely the court. There, the universality of extant law can be balanced with an assessment of the unique mix of factors in the particular case that have a bearing on the application of the law's criteria. These judgmental facts are not empirical truths that can be detected in a scientific manner; they are produced by processes of interpretation and evaluation, although the propositional arguments made within the legal form of life may include predicational empirical truths, i.e. evidence. That form of life entails making arguments that synthesise interpretations of general legal standards with the evaluations of particular evidence, the latter being converted from empirical brute facts into legal-institutional facts.[15]

During this process countervailing considerations can be allowed to enter the argumentative fray, for example distributive justice, interpretive coherence, or questions of due process. Notions such as Dworkin's law-as-integrity or Radbruch's productive tension between justice, legal certainty, and purposiveness are governing ideals in this context, which in every case must be purposely (re-)applied, pulling the parties' arguments this way or that according to the particulars of their case and the moment in political history at which it is raised.[16] In this light, directed interpretation and the formulation of reasoned arguments are not necessary evils of procedure that in an ideal world we might forego so as to skip straight to the holy grail of legal certainty; rather they are constitutive elements of a normative vision of law's nature, built around the aspiration of legality.

Adjudication and machine learning

This process of evaluation, of applying value-based criteria, ultimately allows for new cases to be enveloped by existing rules. As MacCormick suggested almost 30 years ago, '[e]ven if we had in our consciousness a knowledge of every prior case and every hitherto factor with the weighting given to it every time it was considered, we might find

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[12] See generally Mireille Hildebrandt, *Smart Technologies and the End(s) of Law: Novel Entanglements of Law and Technology* (Edward Elgar Publishing 2015).

[13] Jeremy Waldron, 'The Rule of Law and the Importance of Procedure' (2011) 50 Nomos 3, pp. 19-20; Zenon Bańkowski, 'Don't Think About It: Legalism and Legality' in Mikael M Karlsson, Ólafur Páll Jónsson, and Eyja Margrét Brynjarsdóttir (eds), *Rechtstheorie: Zeitschrift Für Logik, Methodenlehre, Kybernetik Und Soziologie Des Rechts* (Duncker & Humblot 1993).

[14] Mireille Hildebrandt, 'Algorithmic Regulation and the Rule of Law' (2018) 376(2128) Philosophical Transactions of the Royal Society A 20170355, pp. 7-8.

[15] Neil MacCormick, 'Legal Deduction, Legal Predicates and Expert Systems' (1992) 5(2) International Journal for the Semiotics of Law 181, p. 190.

[16] Ronald Dworkin, *Law's Empire* (Belknap Press 1986); Gustav Radbruch, 'Legal Philosophy' in Kurt Wilk (ed), *The Legal Philosophies of Lask, Radbruch, and Dabin* (Harvard University Press 1950) p. 107 et seq.

new factors in new cases'.[17] (This is of course in essence a description of what machine learning-based legal prediction systems purport to achieve.) There is and can be no mechanical application of the entirety of this kind of process; there is always the possibility of reasoning to find that the linguistic, political and evidential factors in a new case meet the requirements of the evaluative criteria: 'applying these reasons is a matter of apprehending new information, not just of applying old information'.[18] This kind of flexible legal intelligence is fundamentally at odds with contemporary 'artificial intelligence' systems that may be 'skilled' at narrowly-scoped, well-defined tasks but which do not possess the ability to develop new, effective skills through the synthesis of experience, prior knowledge, and the purposive goal at hand.[19] Legal reasoning is necessarily neither narrow in scope nor well-defined in this sense, given its fundamental purpose of moderating the contingent complexity of human affairs. As a practice it engages a constellation of qualitative skills and sources of knowledge of contingent relevance (tacit, textual, 'suspicious', evidential) as part of a real-time process that cannot be pre-determined if it is to retain these essential characteristics. Even in mundane cases, making a legally-relevant decision is always a new, discrete piece of reasoning that takes into account what went before and synthesises it with factors that are salient in the instant case. This goes for both legislative interpretation and courtroom argumentation.

Of course, machine learning systems can to some extent extrapolate from past patterns contained in the data, providing apparently novel 'findings' in new cases or applications of a rule. But those data, i.e. the legal text, cannot provide all the elements of a legal story that is valid according to the normative conception of law outlined above. Within the scope of the extrapolation that machine learning *can* perform, there is no space to advance the kinds of truly novel argumentation that law must make possible for those subject to it — an argument that suggests a different, contextualised meaning of a word, for example, or the application of an apparently unconnected principle to a

new context that seems necessary in order for justice to be done. As Radbruch suggests, philological interpretation is only the starting point — it guides the ship of legal reasoning only to the edge of port, beyond which it must take course on the open sea.[20] Machine learning is not capable of leaving the wharf even to perform genuine philological interpretation, let alone venturing out into open water to perform reasoned argument.

The form of life within which legal truths are successfully — if temporarily — asserted is irredeemably institutional, built on speech acts, processual legitimacy and sensitivity to human context, and so it is a form of life that is irredeemably human.

A legal argument that successfully metabolises the relevant legal rules and principles, the particulars of the instant case and the governing ideals that channel their interpretations will be certified as a legal truth by the court, subject of course to any possible appeal or contrary rule-making by the legislature. To state that this cannot be a mechanical process is not just to make a claim about the capabilities of machine learning systems to carry out such reasoning, but is also to make a normative argument about the very nature of the process as something that, in order to qualify as law, ought *a priori* to be performed by humans. The form of life within which legal truths are successfully — if temporarily — asserted is irredeemably institutional,[21] built on speech acts, processual legitimacy and sensitivity to human context, and so it is a form of life that is irredeemably human. This is a quality that we should not be coy about protecting, and reinforcing, in the face of computationalist thinking that is insensitive to the medium whose nature it will — perhaps with the best of intentions — invariably alter. At the very least it is necessary to be clear about which of the affordances the current law provides are considered inviolable. These may, in turn, be built upon the affordances of the technology that underpins law, namely

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[17]   MacCormick, 'Legal Deduction, Legal Predicates and Expert Systems' (n 15) p. 193.

[18]   ibid p. 193. For this reason alone, machine learning ought (so far) to be disqualified, given that it can only ever work with past data.

[19]   François Chollet, 'On the Measure of Intelligence' [2019] ArXiv:1911.01547 [cs.AI].

[20]   Radbruch (n 16) p. 142.

[21]   Neil MacCormick, *Institutions of Law: An Essay in Legal Theory* (Oxford University Press 2007).

text.[22] Once we are clear about what affordances must be protected, we are in a better position to identify how they will be changed, removed or augmented, as that underlying mediating technology itself changes.[23]

Computational legalism

In contrast to the vision of legality described above, *legalism* — at least in its stronger variant[24] — requires acquiescence to rules as they are written. The law is 'just there', and citizens are expected simply to act as the rule requires, without thinking about it. Under strong legalism, Ricoeur's hermeneutics of suspicion is displaced entirely by the hermeneutics of faith, or perhaps almost no interpretation at all — the meaning of the text is taken at face value, no enquiry is engaged in (or indeed permitted) as to the world that the text presupposes, which in the case of legislation implies the political world that led to the rule. This requirement to take the rule at face value results from what Wintgens calls the 'veil of sovereignty', or the barrier between law and politics that prevents legal enquiry as to why the rule has the character that it does.[25] There is no latitude for the operation of principles to operate behind the rule, governing how it should be interpreted. Governance thus becomes narrow and 'vicious', and rules the 'implements of tyranny'.[26] Citizens ought to behave like automata, following the rules in what could be described as an algorithmic fashion.[27]

Computation threatens to take this legalistic perspective to a new level, extending and amplifying the characteristics of (strong) legalism far beyond what Wintgens describes. One aspect of this *computational legalism* is the sheer speed of code's execution.[28] Its lack of delay collapses the hermeneutic gap, because not only does text (the source code) constitute both rule and reality,[29] but its application is pre-determined and imposed immediately at the point of execution. This imposition is impervious to any conditions that were not adverted to by the designer during the process of design. Linear time becomes compressed, and the 'user' (a citizen, litigant, jurist, etc.) is given no scope to 'hesitate well', as do judges in their deliberations.[30]

Whereas legal text is inert in the absence of the will to respond to its requirements in real-word behaviour (or to have those requirements enforced by a court), the enablements and constraints of code, put in place by its designer, have a latent efficacy even before the system is operational. The extent to which the hermeneutic gap is thus collapsed is profound, not necessarily through malice or its intentional effacement but simply by the very nature of the technology. 'Ironically', says Leith, 'it is the very rule-based nature of computer programs which disproves the rule-based nature of law';[31] the ruleishness that is paradigmatic of code's character makes it immune to broader context, contrasting dramatically with notions of legality that rely on context and tacit knowledge.

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[22] Diver, 'Law as a User: Design, Affordance, and the Technological Mediation of Norms' (n 1) pp. 30-32. At the level of the artefact, such affordances are called 'sequential'; the use of one affordance reveals another. See William W Gaver, 'Technology Affordances' (Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, ACM 1991).

[23] Mireille Hildebrandt, *Law for Computer Scientists and Other Folk* (Oxford University Press 2020) ch. 1; Hildebrandt, *Smart Technologies and the End(s) of Law: Novel Entanglements of Law and Technology* (n 12) chs. 7-8.

[24] Luc Wintgens, *Legisprudence: Practical Reason in Legislation* (Routledge 2012) ch. 5.

[25] Luc Wintgens, 'Legislation as an Object of Study of Legal Theory: Legisprudence' in *Legisprudence: A New Theoretical Approach to Legislation* (Hart 2002) p. 158.

[26] Bańkowski and MacCormick (n 2) p. 194.

[27] Bańkowski (n 13) pp. 56-57.

[28] I set out the other elements of computational legalism (ruleishness, opacity, immediacy, immutability, pervasiveness and private production) in Laurence Diver, 'Digisprudence: The Design of Legitimate Code' 13(2) Law, Innovation & Technology (forthcoming).

[29] Bruno Latour, 'Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts' in Wiebe E Bijker and John Law (eds), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (MIT Press 1992) n 1.

[30] Bruno Latour, *The Making of Law: An Ethnography of the Conseil d'Etat* (Revised edn, Polity 2009) pp. 193-194.

[31] Philip Leith, 'Common Usage, Certainty and Computing' in Philip Leith and Peter Ingram (eds), *The Jurisprudence of Orthodoxy: Queen's University Essays on H.L.A. Hart* (Routledge 1988) p. 109.

This legalistic character is not limited to the use of computation as a independent regulative 'modality' — that is, where code constitutes and regulates behaviour outside of any legal requirement to do so.[32] The risk is also there when computational systems are used either as elements within the 'toolkit' of the legal practitioner, or have legal operations outsourced to them *per se*. The pragmatic question is whether and to what extent those subject to the rules embodied in the system can see and respond to them. In the context of 'legal tech', there is also an additional risk that a kind of reflexive legalism will arise: by implicitly relying on the ontological 'legalism' of computation, we in turn risk collapsing the spaces for deliberation that legality is built upon. The constraints of code inadvertently become the constraints of law.

Delay as a *normative* affordance

The speed and immediacy of execution under computational legalism are not givens; as with all computational systems those that come to be involved in the legal system are designed, and that design will invariably reflect an 'intentionality' that is in part constituted by the affordances the designer wishes the system to have.[33]

Preserving the hermeneutic gap in the operation of a system is thus a question of affordance, which in turn is contingent on the decisions made by its designer.[34] The need *consciously* to afford delay is especially important, given the apparently ubiquitous focus in software engineering on increasing the efficiency of execution in the service of 'seamless' user experiences.[35] The presumption appears to be that 'inefficiency' and 'friction' are *a priori* undesirable

and in opposition to the user's aims,[36] but this presumes too much about the nature of those aims and the values — instrumental and intrinsic — that might and ought to be reflected in the systems that help facilitate them.

Importantly, my argument in favour of affording delay is not about simply dispensing with the effort of optimising a design and thereby preserving delays in a computational process that could otherwise be removed. Such an approach would be arbitrary, since the range of delays that were thereby preserved would be contingent on (i) where they 'naturally' arise within a given class of system, and (ii) the expertise and conscientiousness of the designer (standards and knowledge will vary as to what counts as 'optimised'). In either case the effect of such 'non-optimisations' might have little relevance to or bearing on the normative goals that are applicable in the broader context within which the system will be used, as in the case of 'legal tech' within the legal system. They might even be irresponsible, where such optimisation is objectively desirable wherever it is possible, for example in reducing unnecessary energy consumption. A naïve approach to delay would also absolve the designer of the normative responsibility I am suggesting they ought to have, where it is incumbent upon them *consciously* to implement delay at points where it plays a *normative* role in the relevant broader context, as in the facilitation of comprehension and interpretability.

The challenge that arises therefore is to identify where delay actually matters in a legal system that is built around text-driven normativity (as well as where it is *un*desirable, for example in terms of facilitating access to justice). Some delays are beneficial, others are negative. Once we have a mapping of the normative terrain, we are in a position to consider how these points of delay do and should map

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[32]   Diver, 'Digisprudence: The Design of Legitimate Code' (n 28); Lawrence Lessig, *Code: Version 2.0* (Basic Books 2006).

[33]   Cf. Ihde's comparison of the different writing styles facilitated by a fountain pen and a word processor in his *Technology and the Lifeworld: From Garden to Earth* pp. 141-142.

[34]   Ihde argues against what he calls the 'designer fallacy', namely the belief that the designer's intent is always reflected in the usage of the technology. His focus is on infrastructural technologies whose foundational roles in society leave open more space for such 'multi-interpretability', and I do not think his argument transfers well to the more tightly-defined affordances of individual code-based artefacts. See Don Ihde, 'The Designer Fallacy and Technological Imagination' in *Ironic Technics* (Automatic Press/VIP 2008).

[35]   Cristiano Storni, 'The Problem of De-Sign as Conjuring: Empowerment-in-Use and the Politics of Seams' (Proceedings of the 13th Participatory Design Conference, ACM Press 2014) vol 14. See also William McGeveran, *The Law of Friction* (University of Chicago Legal Forum 2013) p. 51; Paul Ohm and Jonathan Frankle, 'Desirable Inefficiency' (2019) 70 Florida Law Review 1, pp. 10-13.

[36]   Cf. Ryan Calo, 'Code, Nudge, or Notice' (2013) 99 Iowa Law Review 773.

onto legal practices that are mediated by computational systems, and the extent to which the design of those systems affords them.

The following sections discuss some recent literature concerning the normative value of a lack of 'speed', whereby the conscious slowing down of a computational process can facilitate some broader normative goal. Although not explicitly related to legal practice, fields concerned with the design of digital artefacts can contribute much to the analysis of 'legal tech'; in the legal sphere questions of human-computer interaction will necessarily become questions of *law*-computer interaction, with stakes that have the potential to be qualitatively and quantitatively much higher.

Desirable inefficiency

Ohm and Frankle posit the notion of 'desirable inefficiency', where the 'efficiency' of code (its immediacy) is consciously tempered to protect some other value that might otherwise be undermined.[37] The computational or technical task is the 'basic problem', and the value that its 'efficiency' potentially threatens as the 'enhanced problem', something that requires 'human judgment, values, or discretion in the definition of success or failure'. Sometimes the enhanced problem requires the imposition of so-called 'inefficiency' in order to make space for the human to do what only humans can do. The authors discuss the introduction of a 38-mile length of fibre optic cable into a Wall Street stock exchange that slows down the speed of stock transfers simply by giving the light signal carrying transactional data more cable to travel through. By introducing a tiny delay of 350 microseconds, high-frequency trading is curtailed, in turn ameliorating the risk of instability and market crashes. Another example, particularly relevant in computational law, is proof-of-work in blockchain applications. There the computationally- and temporally-intensive technical process of 'hashing' is introduced into what could otherwise be a near-instantaneous event, namely the recording of a transaction in a database. This introduction of delay subsequently facilitates conditions under which the human values of trust and 'clock time' can be established.

Surprisingly, Ohm and Frankle's analysis explicitly excludes the notion of designing computational systems that 'do no more than slow down the operation of a computer to match the speed of human processing systems'.[38] While they do acknowledge the role of this form of inefficiency, their elision of it is unfortunate given how many 'enhanced problems' necessarily rely on 'human processing systems'. They describe humans as 'devices', apparently akin to other computer peripherals (e.g. a printer or webcam) that require software interfaces ('drivers') to mediate the communication between the host machine and the peripheral, managing the internal speed differential between the former (fast) and the latter (slow). Like the negatively-connoted term 'inefficiency', this analysis seems to centre the machine rather than the human, casting the latter both as 'inefficient' in contrast to the 'efficiency' of the former and as a 'device' that exists to augment the computer (rather than the converse).

As alluded to above, my point is that the 'inefficiency' that is desirable ought to be viewed instead as a deliberate and beneficial slowness — a normative *feature* of the system, rather than a tolerated bug. Considered this way, delay is seen not as a reluctant compromise of machinic nature in favour of the flawed human, but rather as the conscious compromise of the flawed machine in favour of human nature.

Slow computing & friction

Fraser and Kitchin's notion of 'slow computing' reflects this idea of placing the human *qua* human centre stage. Slow computing aims consciously to reduce 'time compression, fragmentation, densification and stresses' in user interactions with computational architectures.[39] Although the authors' focus is on consumer interactions with technology (they discuss measures like disabling WiFi for set times every day, reducing social media and email checking, and

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[37] Ohm and Frankle (n 35).

[38] ibid pp. 35-36.

[39] Alistair Fraser and Rob Kitchin, 'Slow Computing' (The Programmable City Working Paper Series, Maynooth University 2017) pp. 8-9; Rob Kitchin and Alistair Fraser, *Slow Computing: Why We Need Balanced Digital Lives* (Bristol University Press 2020).

using non-'smart' devices), the idea has salience with respect to the interactions of lawyers and citizens with the devices that constitute the emerging 'legal tech'.

In a similar vein, McGeveran's discussion of friction takes a humanistic perspective on the problem of code's immediacy.[40] Like 'inefficiency', the concept bears some ideological baggage, gained in part from software engineering (friction implies an inelegant solution to the problem at hand) and in part from classic-liberal economic thinking (any impediment to a 'clean' transaction is undesirable *a priori*). In social media, 'frictionless sharing' reduces the cognitive load — and by implication the opportunity to pause for thought — involved in sharing things online: it becomes fast, single-click and one-to-many, thus inviting mistakes, ill-considered sharing and 'misclosures'. Increased sharing is of course in the interests of the social media platform, and so reducing the friction involved is primarily in service of this rather than any notion of user benefit. In response, McGeveran posits a 'law of friction', where the amount of friction that the system's design imposes — and beyond certain ontological limitations of all physical systems friction is of course always a designed rather than *a priori* fact — ought to be such that the time taken to share something is not less than the time taken to do it (e.g. read an article, go for a run, etc.).[41]

The salient point is that computation tends toward perfect execution that is anathema to the mediation-by-interpretation that text as a medium requires by necessity and that law-as-we-know-it is in turn built upon. The ideas mentioned above are to an extent individual (and consumer) focused and not concerned with the argumentative nature of law *per se*. But they do point us toward the idea of emphasising the 'human' in 'human-computer interaction', in particular when the computers in question are concerned with law and the delivery of legal services. The next step is to think about such notions through the particular lens of the legal form of life. Two useful ideas that can assist us in this are *tussle* and *adversarial design*.

'Tussles' in computational architecture

Writing with an STS bent in the computer science context, Clark et al. describe the process of 'tussle' in the design of network architectures, where the interests of those with a stake in the architecture come into conflict.[42] The outcomes of the tussles between these interests will have a bearing on the ultimate design of the system, and indeed beyond, with designers playing a special role in structuring the 'techno-social fabric'.

Architectural brittleness is to be avoided: '[r]igid designs will be broken; designs that permit variation will flex under pressure'.[43] Under legality, this is precisely what text-driven normativity affords, namely the ability to flex under pressure; a legal system whose design is more 'rigid', or legalistic, is similarly apt to break. Those who design technical architectures must balance societal tussles against the technical goals, such as 'scalability, reliability, and evolvability', that ordinarily they aim for. As with Ohm and Frankle's analysis, one can appreciate the idea of balancing the technical (basic problem) and societal (enhanced problem), the idea being under the theory of tussle that the code should leave what is properly human to the humans.

Given the nature of software production, the sites where tussle will arise must be anticipated and built into the design ex ante. This means (i) designing for variation in outcome (architectures should be flexible and should not succumb to the brittleness of computational legalism and the privileging of one set of interests that this might entail), and (ii) modularising complex systems to isolate elements that are likely to involve tussles. The aim here is to compartmentalise architectural choices so their effects do not spill over between the technical and the human. The authors discuss how the Domain Name System (DNS) is 'entangled' because it performs both a technical function (naming computers on the web) and an economic/legal one (domain names are trademarks). For present purposes, we can think about how the legalistic architecture of

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[40] McGeveran (n 35).

[41] ibid p. 63.

[42] David D Clark and others, 'Tussle in Cyberspace: Defining Tomorrow's Internet' (2005) 13(3) IEEE/ACM Transactions on Networking (ToN) 462.

[43] ibid p. 466.

a smart contract or the guiding of argumentation by a legal prediction system might conflict with the normative aim of preserving spaces for reasoned argument that can take into account contingent factors not considered at design time.

Here we can see a close connection with the normative ideals of law — the tussle of legal contest between legal subjects becomes, at a lower level, a question of the tussle spaces in the architecture; affording the former requires us to design the latter with appropriate foresight and sensitivity. A certain kind of law requires a commitment to a certain set of affordances, but the promoters of that kind of law might find themselves in conflict with those who have different ideas (i.e. those who build technologies for legal practice, or those who use them to increase 'efficiency' without regard to the broader systemic consequences). The conflict plays out on the technical/design level at a point of tussle, although the nature of the conflict is of course legal or political, in the sense that it is concerned with the nature and role of law within a democracy. Therefore, in order to sustain 'tussle' in the traditional legal sense of balancing competing interests via contestation, we must in turn anticipate it in the technical sense.

Agonism in design

Tussle and the anticipation of conflicting interests are connected with the idea of agonism in constitutional democracy. Agonism sees adversarial debate as fruitful where it enables contrasting points of view to be ventilated and compromise thereby to be achieved. 'Inviting dissent', which can be facilitated by design, is ultimately at 'the core of both democracy and the rule of law'.[44] Agonism can relate to the design of architecture in different ways. The ultimate character of a system might reflect the outcome of an agonistic design process,[45] but it might also facilitate agonistic interactions within its 'runtime' geography, between those who have a stake in its operation or the process it is a part of (as in the law). In the latter case, the designer must *anticipate the anticipation* of conflict; the architecture in its operation must allow for contingent agonism. The designer consciously retreats from the impulse to impose a predetermined outcome (or a design that tends towards them), thus preserving the 'clearing' for agonism, for tussle, within the operating geography of the system.[46] This is one way for computational legalism to contract in proportion to the increase in computational 'legality'.

Almost by definition (if not necessarily by design), text-driven normativity and the legal processes built around it are respectful of tussles and agonistic interaction: procedural flexibility, normative lacunae, and interpretive ambiguities are all points at which (legal, democratic) interests can collide, and it is precisely in the ability to argue about and receive a certified (if temporary) institutional statement of legal truth on the matter that text-driven normativity allows for the pressure of conflict to be released. As suggested above, this is not just about the rote application of substantive rules, but about the generativity of the *process* of grappling with their meanings and implications. As Leith notes, 'where law is important is where there are two sides prepared to argue, rather than agree the law'.[47]

Building space for agonistic confrontation into computational architectures can work to resist the reductive, instrumental rationality reflected in 'algorithmic governmentality',[48] protecting the *communicative* rationality that democracy and justice are reliant upon.[49] This implies the need for the affordance of delay, of so-called 'inefficiency', to circumscribe the speed and apparent certainty of 'technological rationality' in favour of such contingent,

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[44]   Hildebrandt, 'Algorithmic Regulation and the Rule of Law' (n 14) pp. 7-8. See generally Carl DiSalvo, *Adversarial Design. Design Thinking, Design Theory* (MIT Press 2012).

[45]   As in e.g. Constructive Technology Assessment.

[46]   Here ambiguity may play an important role in design practice. See for example William W Gaver, Jacob Beaver, and Steve Benford, 'Ambiguity As a Resource for Design' (ACM 2003).

[47]   Philip Leith, 'The Rise and Fall of the Legal Expert System' (2016) 30(3) International Review of Law, Computers & Technology 94, p. 102.

[48]   Antoinette Rouvroy and Bernard Stiegler, 'The Digital Regime of Truth: From the Algorithmic Governmentality to a New Rule of Law' (2016) 3 La Deleuziana: Online Journal of Philosophy 6.

[49]   Auke Pols and Andreas Spahn, 'Designing for the Values of Democracy and Justice' in Jeroen van den Hoven and Pieter E Vermass (eds), *Handbook of Ethics, Values, and Technological Design: Sources, Theory, Values and Application Domains* (Springer 2015).

evaluative, hermeneutic spaces. Computational systems that are involved in law ought therefore to respect the humanity that is constitutive of such spaces. This means it is incumbent on designers consciously to hold back the technological normativity of their systems, like the ropes around a boxing ring, in order to facilitate the elements of the legal struggle that are inherently human.

Conclusion

We should think of delay as a normative affordance that is fundamental to the nature of law-as-we-know-it, and not something that is intrinsically undesirable and always to be eliminated. The challenge is to identify those points at which it contributes to the legal practice at hand, and to translate it as necessary into the design of the computational tools that are increasingly being integrated into the legal system. Part of that challenge will be to convince those of a computationalist bent that efficiency is not an end in itself. In making such an assessment we have to be clear-eyed about the nature of the computational system being mooted, the point in the legal process where it will be deployed and the role in affording legality played by the 'human' task that it will replace or augment. The normative ramifications will vary significantly — a lawyer's use of a predictive legal analytics system during a live litigation will have different implications from its use by an academic conducting research in legal anthropology.

Computational systems can of course assist us in overcoming human limitations, but care must be taken when using them in domains that are properly the preserve of human capacities. How to achieve an appropriate complementarity between human and computer — what Ashley calls 'cognitive computing'[50] — is by no means obvious, particularly in light of ideological and economic incentives that may favour the greater adoption of supposedly 'clean' and predictable legal computational systems. If we value the characteristics of the hermeneutic gap and the opportunity it gives us to interpret and be 'suspicious' of a (legal) text, then the introduction of computational systems into legal practice requires us to think about the effect of those

systems on those characteristics. Preserving spaces for the uniquely human aspects of legality requires a clear vision of what affordances they rely on. The fundamental question of *time*, and how the design of legal technologies can best reflect its normative role, would be a good place to start.

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A reply: **Waiting for Gadamer**

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Diver's paper expresses the normative importance of planned temporal spaces within the law. These spaces, characterised as hermeneutic gaps, exist between text and interpretation or instantiation, allowing for the construction of meaning and subsequent action on the basis of the legal text. Diver posits that such gaps introduce necessary slowness to the process affording reflection, debate and sense-making. He continues that, in order to minimise the prevalence of purely reactive law-making, such slowness ought also to be built into the design of computer systems which 'come to be involved in the legal process'.

This work highlights a series of specific insights of relevance for Human Computer Interaction (HCI). Firstly, that building conscious delay into computational systems might enable normative processes to more effectively intersect with systems design. Secondly, that ongoing pursuit of seamless user experiences forecloses opportunities for engagement with the text, meaningful reflection, suspicion and interrogation, thereby limiting agency and autonomy. Thirdly, that the speed of computational processes disallows agonistic engagement such as contest, debate and negotiation and finally, that the drive for system speed and seamlessness compounds these effects by concealing the reasoning underpinning the function of a system, thereby adding a further layer of necessary interpretation within a field historically driven by human logic and argumentation.

The notion of a seamless user experience is core to the practice of HCI and is based upon tenets that place systems as not only intentionally unremarkable tools in the hands of the user, but also as sites of displacement and distribution of cognitive load; effectively invisible in use, supported by minimalism in user interface design. This belief has guided much thinking in HCI, despite a counterpoint found in the desire for interfaces to enable user awareness and control. Whilst these two positions sat comfortably alongside each-other in the early years of the discipline,

the development of complex algorithms, deep-learning and unsupervised learning has enabled the former position and problematised the latter. Whilst algorithmic systems and minimal interfaces enable more seamless user interaction they also effectively disable, or demote, user awareness and control within their design.

The notion of designing-in conscious delay is one which speaks directly in opposition to the dominant narrative of system efficiency. As in the case of law, so this is true for any normative process. Take consent, a common concept in legal processes, within online systems, and in social and political life. In the online context, the designer's drive to bring the user closer to their end-goal, for example accessing a website, has resulted in check-box reductionism. The construction and rendering of notice and assent within interface design are irritants, to be dispensed with immediately. Compare this to signing a document, where that physical act conveys weight and gives the signatory pause. Online, this signal of assent becomes the functional equivalent of swiping left; where one indicates the desire to dispense with the screen and move on. This is in conflict with the intention of the consent process as there is no time for reflection, negotiation or even understanding of the underpinning conditions. As with many aspects of ethics, the inherent friction is smoothed through the lens of design.

Scholarly work from HCI has explicitly promoted minimal distraction in user experience, in essence eliminating spaces for reflection and understanding, by design. It is undeniable of course that users find the distraction irritating, diminishing their experience. As designers we also make use of distraction such as delay, colour or audio cue to indicate danger or error. However, this approach utterly fails to consider the wider normative value of forcing a pause. In this context, the notion of an in-built hermeneutic gap sits in opposition to the design intention, and from an interaction perspective would likely increase user cog-

nitive burden, resulting in disengagement. The balance between normative requirements, system efficiency and user expectation pose a non-trivial challenge. There are, of course, exceptions. Building slowness into interactions designed to support specific functions, such as learning for example (consider help-functions and pop-up boxes), are demonstrators for how design intention might drive the rendering of a system if the function were deemed necessary.

Within the broad church of HCI temporality is a recurrent theme, though mainstream and industrial interaction design patterns generally remain unchallenged. Despite this, scholarly efforts have sought to progress our thinking. Temporal design was proposed as a means to think beyond conceptions of temporality within design as simply pace and direction, and towards a 'more specific focus on issues of ethics, equality, power, and social management and coordination' [2, p. 1]. This reflects points made by Diver in that both papers consider the building of time into design as a space for debate and negotiation. Similarly, slow computing posits the need to reposition the locus of control away from the platforms that seeks to fragment and commodify our lives, taking an explicitly political stance.

More pragmatically, within the domain of Computer Science, Chalmers proposed that, counter to the dominant trend for seamless user experience, deliberately exposing or exploiting 'seams' (error, uncertainty, delay) within ubicomp systems allows user understanding, appropriation and reflection [1]. However, the disciplinary obsession with concealment of error and adjustment, smoothing away any friction, has seen little notable challenge. The exception to this lies in the field of explainable AI. Here, machine learning practitioners have surfaced debates around whether there is an inherent contradiction between the desire for explainable or comprehensible systems and their efficiency, and here is where we might find fertile ground for further development. If the byproduct of rendering a system explainable does indeed result in moments of pause or delay, both within the operation of the system and within the wider socio-technical context (for example, to enable detection of bias), might we also exploit these temporal gaps for further normative purpose?

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Author's response: **Breaking the hammer, by design**

Laurence Diver

An especially interesting observation in Luger's reply is that '[t]he balance between normative requirements, system efficiency and user expectation pose a non-trivial challenge'. This is reminiscent of Radbruch's antinomian characterisation of law, where the three aims of legal certainty, justice, and political purposiveness are in constant tension with one another, keeping the law aloft like the buttresses of a cathedral.[1] The idea of balancing design aims raises many questions about economic incentives and the power that designers enjoy. Nobody wants a system that undermines the normative requirements of the rule of law, or is inefficient, or that unnecessarily frustrates the user's expectations. But, as with Radbruch's 'triangular' antinomy, in extraordinary times one of the aims might require particularly strong assertion, with the others temporarily receding in prominence. By analogy, if legal technologies are seen as 'extraordinary', the relevant aim must surely be to protect the rule of law, since a failure to do so — which entails precautionary anticipation of the reflexive ways one can fail — means the other two goals are in a perilous state in any case. Sometimes, therefore, system efficiency and the individualised expectations of the user — and the commercial incentives these are proxies for — must yield, so as to ensure the meta-protection of the rule of law can continue, in substance as well as in form.

As Luger points out, there are exceptions to the default goal of efficiency, where slowness is consciously built into a system to facilitate some other aim, for example in educational settings. Crucially, she notes, such a 'design intention might drive the rendering of the system if the function were deemed necessary'. From a democratic perspective, this raises two important questions: first, what is the *quality* of delay afforded by that rendering (where, when, how, and to whom)? And second, *who* deems whether or not a given affordance of delay is necessary or desirable enough to be included?

Exactly *who* the 'user' is of a legal technology is an important question too. Sometimes it will be the citizen, other times her legal representative, the court, or a public administration. Although lawyers have always mediated the legal system for their clients, legal technologies add a potentially problematic additional layer. Legal practitioners will be forced to advise, argue and adjudicate within the churn of a legal system being reflexively moulded by data-driven systems built around statistical notions of 'prediction'. In an increasingly competitive market, they risk being seduced by overblown sales pitches and claims of speedy effectiveness. Perhaps worse still is where those claims are actually true, at least in a narrow statistical sense; the subscription of jurists to the efficient outputs of such systems might come to constitute what is pragmatically 'effective' within the real-world practice of law. Asking whether or not this simulacrum of law corresponds with the structural values of the rule of law becomes secondary, in the face of short-term gains enjoyed by both the winning litigant and by the supplier of legal technology — the latter's product edging ever closer to pragmatic indispensability.

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[1]   Gustav Radbruch, 'Statutory Lawlessness and Supra-Statutory Law (1946)' (2006) 26(1) Oxford Journal of Legal Studies 1.