



Computational Law and Epistemic Trespassing

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Abstract

This article uses the concept of 'epistemic trespassing' to argue that technologists who propose applications of computer science to the law should recognize and incorporate legal expertise, and that legal experts have a responsibility not to defer mindlessly to technologists' claims. Computational tools or projects developed without an understanding of the substance and practice of law may harm rather than help, by diverting resources from actually useful tools and projects, focusing on unimportant questions, answering questions incorrectly, or providing purported solutions without sufficient attention to the larger context in which law is created and functions.

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Technologists who propose applications of computer science to the substance of law, the representation of law, and the making (and unmaking) of law should recognize and incorporate legal expertise. Similarly, legal experts have a responsibility not to defer mindlessly to technologists' claims. Computational law, and the field of computer science, have much to offer law and legal practice. But effectively creating and evaluating legal technology requires not only technological expertise but also legal expertise that is specific to the legal issue or project in question. Computational tools or projects developed without an understanding of the substance and practice of law may harm rather than help, by diverting resources from actually useful tools and projects, by focusing on unimportant questions, by answering questions flatly incorrectly, or by providing purported solutions without sufficient attention to the larger context in which law is created and in which it functions. And a lawyer who mindlessly adopts an 'interesting' computer science application built on a faulty or incomplete understanding of the law may in turn harm their client.

People who are experts in the law know and understand matters that people who have not studied law and who are not experts in it do not know. Some of what such legal experts know is substantive: what the law is. Some of what they know is procedural: how the law works. Law is not self-explanatory, and thus some of what legal experts know is how to discern what the law means – how to read and understand presentations of the law in statutes and legislation, court cases, and other governmental guidance, taking into account not only the words in front of them but the context in which those words are constituted. Legal experts may also know how to combine these various types of knowledge to create arguments that sound in the law, how to identify and reconcile contradictions or apparent contradictions, what types of arguments are relevant, and what 'counts' as justification.

Consider, for example, the post and ensuing comments on a popular philosophy blog attempting to understand a particular section of the U.S. tax code and a proposed amendment to that section.¹ Philosophers are trained in reading

difficult texts; indeed, one might say that is a core area of their expertise. The subsection in question is quite brief and includes no obvious difficult words or even phrasing. Yet the original post, by a philosopher, mischaracterized both the statute and the proposed amendment. His subsequent changes were also incorrect; he finally settled on a roughly correct characterization that he supported by referencing an article in *The Chronicle of Higher Education*. Commenters, apparently mostly philosophers, were also unable to parse the proposed changes and the section accurately (notwithstanding that one commenter 'tr[ie]d' to analyze the proposition expressed... in predicate logic', a desire to which I am quite sympathetic). The general skill of 'reading a text' was, it seems, not sufficient to read the special kind of text that is a tax statute.²

Even within law, there is expertise within expertise. In large law firms, for example, different lawyers specialize in different types of law. Corporate lawyers know something about tax law, but they would not do the tax work on a large deal. Even within the tax department, one lawyer might specialize in partnership tax, while another lawyer focuses on international tax. Some areas of law are so complex that a single person can be an expert in only a small part of that law. The level of specialization can be seen, for example, in a directory of attorneys who work for the Chief Counsel's office of the Internal Revenue Service (the United States tax administration). In 2022, the directory was 63 pages long, organized not only by Internal Revenue Code section (for example, Section 1), but sometimes down to the level of subsection (Section 1(h)) and paragraph (Section 1(h)(1)).

Not only is the subject matter of law complex (the 'what' of law), but the ways in which law is made and changed (the 'how' of law) is also complex and has been developed over many centuries. The relevant rule in a given situation – the substance of a statute, or the holding of a case, for example – is important, but that 'bottom line' is not the only important aspect of the law, and it is not all that constitutes the law. How that rule was made and justified – who decided, who got to provide input relevant to that decision, what information about that decision and its jus-

¹ Justin Weinberg, 'Tax Proposal Would Make Getting a PhD in the US Very Expensive' (Daily Nous 2017) (<https://dailynous.com/2017/11/06/tax-proposal-make-getting-phd-us-expensive>).

² For further discussion of this point, see Sarah B. Lawsky, 'Teaching Algorithms and Algorithms for Teaching' (2021) 24 *Florida Tax Review* 587.

tification is made public, and so forth – also matters. As Mireille Hildebrandt evocatively states, law is not ‘a bag of independent rules.’³ As she explains, ‘In many ways, law, morality, and politics are mutually constitutive.’⁴ Thus even if one can, on some level, comprehend the meaning of a legal rule in the most literal sense, *understanding* the rule includes understanding how and why it came to be constituted.

Nathan Ballantyne’s work on epistemic trespassing provides a helpful frame for organizing thinking about work at the intersection of computer science and law.⁵ As Ballantyne defines the concept:

Epistemic trespassers are thinkers who have competences or expertise to make good judgments in one field, but move into another field where they lack competence – and pass judgment nevertheless.⁶

Ballantyne distinguishes between ‘holding confident opinions’ and ‘investigating questions in another field.’⁷ The former is problematic; the latter is not. Ballantyne argues that epistemic trespassing can harm by leading other people into error, but also by taking up expert resources as experts have to spend time ‘refuting the trespassers’ mistakes.’⁸

The biggest risk comes not from high-profile epistemic trespassers - such as those who are prominent in popular media, Ballantyne argues, but rather from more subtle trespassing that can arise in interdisciplinary academic work. He terms the questions that tend to generate such trespassing ‘hybridized questions’: questions ‘addressed and answered by combining evidence and techniques from two or more fields.’⁹ As questions are not intrinsically hy-

brid or not hybrid, and as the idea of a field is not fixed, Ballantyne’s use of the word ‘hybridized’ refers to questions that can be *made* hybrid, rather than simply the concept of a ‘hybrid.’

Consider for example the rise of law and economics in the 1980s within the legal academy. ‘Who should bear legal responsibility for this occurrence?’ can be answered without an appeal to economics. People answered and reasoned about these questions without explicitly using economics for hundreds of years, before there was an area of study called economics, though not, of course, before economic thought. Bringing the lens of economics enabled a different kind of reasoning about these questions, and sometimes different answers. Questions that had not been hybrid questions became hybrid questions by combining legal and economic forms of analysis.¹⁰

Academic questions can also become hybridized as the world changes. Issues related to tax compliance, and even the more specific questions of how to translate tax law into algorithms to make easier both tax compliance and enforcement, long predate computers.¹¹ But the U.S. Internal Revenue Service has historically applied cutting-edge technology to enforce taxes, such as using a hydrometer to measure and tax alcoholic spirits more accurately,¹² and they have embraced computational technology as it became available. The IRS began using computers in 1950, and by 1962 had fully implemented an automatic data processing system.¹³ As quickly as 1961, an article was published in a leading law review identifying the huge potential of ‘electronic brains and the legal mind,’ within, amongst others, the area of tax administration.¹⁴ The practical relevance of developing computational technology to address longstanding issues could not be ignored, and thus the

³ Mireille Hildebrandt, *Law for computer scientists and other folk* (Oxford University Press 2020) 20.

⁴ *ibid* 31.

⁵ Nathan Ballantyne, ‘Epistemic Trespassing’ (2019) 128(510) *Mind* 367; Nathan Ballantyne, *Knowing our limits* (Oxford University Press 2019) 195–219.

⁶ Ballantyne, ‘Epistemic Trespassing’ (n 5) 367.

⁷ *ibid* 370.

⁸ *ibid* 370.

⁹ *ibid* 372.

¹⁰ Steven M Teles, *The rise of the conservative legal movement: The battle for control of the law* (Princeton University Press 2008).

¹¹ The history of tax compliance is as long as the history of taxes; but even in the relatively recent past, for example, there is an Internal Revenue Service individual tax form from 1864.

¹² Internal Revenue Service, *IRS History Timeline: Publication 5335* (2019).

¹³ *ibid*.

¹⁴ John R Brown, ‘Electronic Brains and the Legal Mind: Computing the Data Computer’s Collision with Law’ (1961) 71(2) *The Yale Law Journal* 239.

questions of tax administration and compliance became a hybridized question for scholars as well.

Ballantyne suggests various approaches for experts who engage with hybridized questions. One approach is to retreat from hybridized questions. Full retreat in the area of law and computer science would mean that computational concerns and insights would not be taken into account when attempting to solve legal problems, and legal insights would not be considered relevant to technological or computational problems. Such approaches would be neither desirable nor, indeed, even possible. At this point, law and computer science are intertwined in many ways and have been for many years, and many of these connections are unavoidable. Hildebrandt argues persuasively that legal questions are present in and engaged by decisions in computer science, whether computer scientists acknowledge this or not.¹⁵ And the potential of computer science as applied to legal questions and applications is also well established; Hildebrandt, for example, provides an overview of various types of computational technologies that may have significant impact on the practice of law.¹⁶

Another approach that is not quite full retreat is to ‘conditionalize’ assertions, where a computer scientist could say, regarding a claim p within law, ‘If p is true, then q is true,’ while denying they have knowledge or reasonable belief that the antecedent is true.¹⁷ Ballantyne argues that conditionalizing is one way for experts to stick to their own field and answer non-hybridized questions. I am skeptical about conditionalizing as an approach when it comes to hybridized questions in law and computer science, and once again I draw my skepticism from the legal field’s experience with law and economics. The siren song of apparent objectivity and conclusiveness can be difficult for lawyers and legal scholars to resist. Certain types of neoclassical economic arguments depend on simplifying assumptions. There is nothing intrinsically wrong with simplifying as-

sumptions; to thus argue would be to argue against modeling in general. But as in law and economics, the existence of these assumptions has too often been disregarded as lawyers and policymakers glibly reason from stylized models to the real world.¹⁸ The risks here are great. A model of the physical world might result in a machine that does not work; the physical world itself provides information about whether the simplifying assumptions are incompatible with the modeler’s goals. In contrast, a legal conclusion that depends on simplifying assumptions, and is therefore in some meaningful or normative sense inaccurate or harmful, can nonetheless be enacted or acted upon by humans.

Setting aside full retreat and conditionalizing questions, then, another and perhaps the most obvious approach that Ballantyne suggests is for an individual to ‘obtain further expertise.’¹⁹ By this Ballantyne seems to mean that the individual who is an expert in one area and wishes to engage with a hybridized question should themselves acquire personal expertise in the other area. I am highly sympathetic to this approach, and I think it is possible in some cases. One individual may genuinely have expertise in two fields. Many philosophers of physics have advanced degrees in both philosophy and physics. Many law professors in the United States have advanced degrees in fields other than law and use their other scholarly expertise to inform their work within law. But there are limitations to this approach; acquiring expertise in another field takes both time and, perhaps, ability; many people will lack one or the other, or both. And as noted above, a degree is not equivalent to expertise.

After warning of the dangers of epistemic trespassing, Ballantyne suggests various possible defenses or justifications of epistemic trespassing. I will use the example of a computer scientist putting forward propositions about what the substance of law should be or how law should be made. One defense might be that people who have studied law

¹⁵ Mireille Hildebrandt, ‘Understanding law and the rule of law: A plea to augment CS curricula’ (2021) 64(5) *Communications of the ACM* 28.

¹⁶ Mireille Hildebrandt, ‘Grounding Computational ‘Law’ in Legal Education and Professional Legal Training’ in Bartosz Brożek, Olesia Kanevskaia, and Przemysław Pałka (eds), *Elgar Handbook on Law and Technology* (Edward Elgar 2023).

¹⁷ Ballantyne, *Knowing our limits* (n 5) 219 n.9.

¹⁸ See, for example, Neil H Buchanan, ‘Playing with Fire: Feminist Legal Theorists and the Tools of Economics’ in Martha Fineman and Terence Dougherty (eds), *Feminism Confronts Homo Economicus* (Cornell University Press 2005); Sarah B Lawsky, ‘How Tax Models Work’ (2012) 53 *Boston College Law Review* 1657.

¹⁹ Ballantyne, ‘Epistemic Trespassing’ (n 5) 374.

do not have any relevant evidence or skills that bear on the computer scientist's view about what the law should be or how the law should be made. This seems implausible on its face; at the very least, given how long legal systems have been functioning, one should have to expend 'considerable effort,' as Ballantyne puts it, to show that this is true:

Suppose we think we know why some field's evidence or skills are a sham. Let's see what the apparent experts think. They may school us on the actual nature of their field's practices and reveal our ignorance.²⁰

Another defense would be that computer science 'conclusively establishes' what the law should be or how it should be made, without any input at all from law. This also seems implausible on its face – it is difficult if not impossible to imagine how the discipline of computer science, without any input from law, could under current circumstances itself establish what the law is, especially as the law creates itself, in some sense.

A somewhat more plausible claim that one might use to defend epistemic trespassing, might be that technological substantive knowledge or processes directly transfer to the area of law, without any additional input needed from the field of law itself.²¹ As Ballantyne explains, 'a reason to accept [this view] must be joined by a reason to believe [that the technologist making the transfer] satisfies the relevant evidence threshold for cross-field expertise.'²² Ballantyne delves into work on knowledge transfer and ultimately argues that people seeking to transfer their area knowledge to another field should be slow to accept that this transfer can occur effectively without additional input needed from the field to which they propose to transfer their knowledge. Caution is warranted in part because 'slight changes between contexts. . . can derail transfer,' and in part because 'background knowledge is crucial for the successful application of skills in any domain.'²³

How, then, are hybridized problems to be managed? Ballantyne suggests two answers. First, a researcher identifying, creating, or facing a hybridized problem should have what Ballantyne calls 'intellectual modesty' and what I might call 'humility.' Second, the researcher should acquire more knowledge. As mentioned above, time and ability might limit one's capacity to do so. But expertise relevant to a particular problem need not reside in a single person; it can reside in many different places and different people. Hybridized questions are best tackled by bringing together different experts and acknowledging the relevance and importance of their different views. As Ballantyne writes, 'Trespassing is a problem for individual thinkers, but it points towards solutions that make use of our capacity for working together,'²⁴ or 'social solutions.'²⁵

The key elements, then, are intellectual modesty or humility, and working together; and working together effectively requires intellectual modesty and humility. Such an approach to a hybridized legal question does not require formal training in law; at issue here are not social markers or credentials, but rather whether a person has the actual ability to answer and evaluate questions and evidence.²⁶ Whether someone is an epistemic trespasser into the field of law is therefore distinct from the question of whether someone is a member of the legal profession,²⁷ which requires not only a legal degree but also further qualification as, for example, being a member of a bar (in the United States). And many people without law degrees have made important contributions to law and legal studies. For example, John Horty is a philosopher with no academic degree in law. His scholarship on legal reasoning has nonetheless (rightly) shaped the field of formal rep-

²⁰ Ballantyne, 'Epistemic Trespassing' (n 5) 381.

²¹ *ibid* 370.

²² *ibid* 382.

²³ *ibid* 386.

²⁴ Ballantyne, *Knowing our limits* (n 5) 218.

²⁵ Ballantyne, 'Epistemic Trespassing' (n 5) 391.

²⁶ *ibid* 371.

²⁷ As described in, e.g., Andrew Abbott, *The system of professions: An essay on the division of expert labor* (University of Chicago Press 2014) ch. 9.

resentation of law.²⁸ His contributions to law are widely recognized within the legal field, one article winning best paper at the International Conference on Artificial Intelligence and Law,²⁹ and another included in an anthology of philosophy of law edited by two law professors.³⁰ What allows Horty to make these valuable contributions without formal legal training is the depth and care with which he engages with the legal literature addressing the questions to which he brings his insights. He does not brush off prior work; rather, he engages it deeply and shows, for example, how his formal work unites models of legal reasoning proposed by experts. He joins the conversation. His intellectual modesty and humility allow him to acquire sufficient knowledge to engage meaningfully – indeed, transformatively – with hybridized questions.

Social solutions will more commonly involve teamwork among individuals with varied expertise. Pair programming is an example of a social solution to the problem of epistemic trespassing. When formalizing law into a computer programming language, the programmer and the legal expert can work together, looking at the computer screen at the same time, to write computer code that represents the law more accurately than if just the programmer or the lawyer wrote the code as an individual. This way, the programmer need not be an expert in the law, and the lawyer need not be an expert programmer.³¹

Respecting expertise does not mean that current categories, divisions, definitions, or understandings in law should be considered untouchable. As discussed above regarding the incorporation of mechanized computation into tax administration, law should and will incorporate new insights and reorderings. But respecting expertise does mean, for example, that someone proposing a computer science application to the law should at a bare min-

imum state the relevant law correctly. That is, even if the project makes a valuable contribution to computer science, if it operates on law, the law should be accurately characterized. For example, in an example of epistemic trespassing, AI fairness toolkits use a definition of disparate impact that is oversimplified and pulled out of context: ‘[R]eaching for a single [metric] to encompass the entire body of [antidiscrimination law] is overly reductive and trivializes important aspects’ of a disparate impact finding.³² This choice ‘carries obvious legal risks for users.’³³ For example, some toolkits that include this inaccurate metric provide techniques to ‘remove’ discrimination and disparate impact that actually involve only removing the elements that fulfill the inaccurate characterization of the law.

Intellectual humility and modesty also mean that technologists who believe that something in the law – whether substantive, procedural, or methodological – is ridiculous, should, instead of dismissing it as ridiculous, ask, first, ‘Have I misunderstood this thing? If I have not misunderstood it, *why* it is that way? What purpose does this rule or approach serve? What concerns or limitations might have shaped this?’ Shaping forces or limitations can take many forms – political, legal, practical. Law and law-making processes can always be improved, and computational law can help make those improvements. But while something about the law might well be wrong, or subject to improvement, it is unlikely that it is the way it is by accident, or because nobody ever thought about it before. The better answer might well ultimately be that the thing in question should be changed. But whether and how something should be changed should be informed by a deep understanding of that thing, including what has gone before.

²⁸ E.g., Horty John, ‘Reasons as Defaults’ [2012]; John F Horty, ‘Reasoning with dimensions and magnitudes’ (ICAIL ’17, Association for Computing Machinery 2017); Jonh F Horty, ‘Open texture and precedent’ in Leslie Green and Brian Leiter (eds), *Oxford Studies in Philosophy of Law, volume 5* (forthcoming, Oxford University Press 2024); Jonh F Horty, *The Logic of Precedent: Constraint and Freedom in Common Law Reasoning* (forthcoming, Cambridge University Press 2024).

²⁹ Horty (n 28).

³⁰ Horty, ‘Open texture and precedent’ (n 28).

³¹ The advantages of pair programming in this fashion are described in, for example, Liane Huttner and Denis Merigoux, ‘Catala: Moving towards the future of legal expert systems’ [2022] *Artificial Intelligence and Law*.

³² Elizabeth Anne Watkins, Michael McKenna, and Jiahao Chen, *The Four-Fifths Rule Is Not Disparate Impact: A Woeful Tale of Epistemic Trespassing in Algorithmic Fairness* (techspace rep, P22-1, Parity Technologies 2022).

³³ *ibid.*

True collaboration is necessary for the social solution to approaching hybridized problems, and here the lawyer has a responsibility as much as the technologist. It can be tempting for lawyers to think that something that appears to involve math, or computers, is objectively right in some way. Part of the rise of the law and economics movement was lawyers' and legal academics' desire for certainty, for law to be a science.³⁴ But while numbers and equations may seem conclusive, equations that operate on profoundly simplifying assumptions are not actually scientifically compelling and do not necessarily teach anything about the real world.³⁵ Similarly, lawyers must not be intimidated by the apparent mysteries of technology. Lawyers do not need to be experts in computer science or technology to be useful collaborators. They can be useful collaborators if they are willing to ask questions informed by their legal knowledge and if they can remain uncowed by the presence of technical analysis.

For example, take the recommendation that legislation should be made using a particular method of software development, 'agile' practices.³⁶ Using Ballantyne's framework, one can propose different claims that might underlie that recommendation. Perhaps the claim is that people who have studied law and implemented legislative processes, do not have any relevant evidence or skills that bear upon the question of how the law should be made, or that the arguments for the agile approach conclusively establish how law should be made without any input from the field of law, or legal experts. These seem to be unlikely arguments. The claim would be that this method that originated in computer science directly transfers to the law. But there is no reason to accept this claim without an affirmative argument. Instead, if someone believes that agile methods should be incorporated into lawmaking, Ballantyne's analysis suggests there should be a discussion among technologists, policymakers, and lawyers.

Technologists may be best suited to understand agile practices, and policymakers and lawyers will have insights into the details and specifics of law and lawmaking. Both sides

should approach this now-hybridized question with humility and a willingness to learn from each other, and also a commitment to bring their actual knowledge to the conversation and not to be won over by the promise of a 'quick fix.' The proposal to incorporate agile practices into lawmaking may then result in changes to specific approaches to the making of legislation that incorporate specific elements of agile practices without the approach of agile practices simply dictating how law should be made.

If agile practices say that the approach should be X, then X can be introduced into the conversation. Ultimately, 'the government should do X' would be supported not by 'because agile practices dictate that the government should do X,' but by 'because given a full understanding of the computational tools being used and legal values, practices, and limitations, X is the right approach for the goals of this project.' That is, for example, the structure of the argument that Liane Huttner and Denis Merigoux make when arguing that pair programming should be used when formalizing law.³⁷ Pair programming is, as they note, part of agile software design, but they do not argue for pair programming on that basis. They argue for pair programming because, as they show at some length, 'the interaction between lawyers and programmers is crucial for debugging legal expert systems.' If the goal is creating accurate, transparent code, then pair programming avoids various pitfalls that other approaches run into.

Such a discussion may also reveal that in fact some core values of agile practices for software development are already embraced by governments and are implemented to the extent possible, given the limitations that governments face. Consider, for example, this argument:

Legislation that directs regulation could better incorporate agile principles by allowing for iterative approaches rather than one-size-fits-all forever standards. Regulatory sandboxes, performance-based standards, and – the holy grail – effective amendment of outdated statutes by Congress

³⁴ James R Hackney, *Under cover of science: American legal-economic theory and the quest for objectivity* (Duke University Press 2007).

³⁵ Buchanan (n 18).

³⁶ One example among many is Hedi R King, 'Regulation Must Become Agile to Remain Relevant' (The Regulatory Review 2023) (<https://www.theregview.org/2023/08/02/king-regulation-must-become-agile-to-remain-relevant/>).

³⁷ Huttner and Merigoux (n 31).

would go a long way towards ensuring a relevant effective regulatory system.³⁸

One might ask: does Congress fail to amend outdated statutes because it lacks a commitment to ‘innovative ideas, efficient execution, collaborative communication, experimentation, and iterative design’? Or might there be other, larger, political reasons why outdated statutes are not amended promptly, if ever? Is there anyone who affirmatively advocates for outdated statutes to be kept on the books, or is this a situation where everyone might agree on a desirable outcome, and actual existing issues might be preventing that desired outcome? To be clear, I take no particular view on the correct outcome of this discussion; I simply suggest how a discussion should proceed – with care, thoughtfulness, humility, and respect from participants with a range of expertise.

Ballantyne proposes the image of an ‘easement’ or ‘right of way’ as the solution to epistemic trespassing:

[W]e must rely on the expertise of others. What we need... is an ‘easement’ or ‘right of way’ for travel beyond our fields’ boundaries... Trespassers may gain reasonable beliefs by engaging in certain kinds of discussion with cross-field colleagues.³⁹

While I agree with the spirit of this idea, this particular image highlights one problem with Ballantyne’s proposed terminology, though not his underlying ideas. An easement is permission granted from someone who owns property for someone else to use the property. Nobody owns a particular area of study. The easement image evokes epistemic gatekeeping – not what Ballantyne intends. No intellectual territory should be off limits to anyone; people should be able to walk anywhere that they would like to as they explore and go wherever they need to answer their questions. Thus, consistent with Ballantyne, I suggest that someone approaching or creating a hybridized question should tread softly; recognize that others who have been there before for many years know much about this land; and if they cannot thoroughly learn the land before they go, bring a guide who knows the territory.

³⁸ King (n 36).

³⁹ Ballantyne, ‘Epistemic Trespassing’ (n 5) 389.

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