Does AI Warrant Doctrinal Reform? Algorithmic Contracts and the Resilience of the Common Law

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Abstract—The increasing prevalence of artificial intelligence and algorithm-driven automation pose pressing questions for the law of contract formation and performance. This article argues that the common law of contract can accommodate algorithmic contracting within existing doctrinal tools and will not need a doctrinal overhaul. It relies on the limited deterministic AI cases seen and develops the central claim that, despite their differing levels of 'automation', when probabilistic AI forms begin to appear in litigation, they will largely pose the same challenges for contract law as those raised in deterministic AI cases. The article draws connections to previous developments faced by the common law, such as industrialisation and the adoption of instantaneous communications, electronic commerce, and

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electronic signatures. It contends that the emerging Commonwealth case law reflects a consistent judicial preference for treating algorithms as tools embedded within existing legal structures rather than as entities requiring new personhood or modified formation rules. In acknowledging the valid concerns around developments such as the 'black box problem', this article endorses and develops an underexplored connection between tort law doctrines as complementary remedies to contract law doctrines to confront the emerging challenges.

I. Introduction

Few topics today are as widely discussed as the impact artificial intelligence ('AI') and algorithms will have on societal functions. More often than not, these discussions are catastrophist and depict sharp departures from social normality. Contract law is no exception. However, arguably, the common law's greatest strength is its capacity to evolve and adapt with the times. As compellingly described by Laws LJ, 'the methods of the common law are evolution, experiment, history and distillation',[1] a process which continues to define the development of law, both old and new. In 1607, it waded through the complex question of whether a king could act as a judge in *Prohibitions del Roy*;[2] in 1932, it formed the modern basis of negligence through the 'neighbour principle' in *Donoghue v Stevenson*;[3] and today, it finds itself grappling with complex questions on algorithmic contracting. As a polarising contemporary challenge, legal practitioners and academics find themselves somewhere on a spectrum between two opposing camps: (i) the pragmatists, who contend that existing legal mechanisms can manage the complications arising from algorithmic contracting;[4] and (ii) the reformists, who advocate that substantial legal reform is needed to confront emerging

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[1] Laws LJ, Lord Justice Laws, 'Our Lady of the Common Law', (ICLR Lecture, 1 March 2012) <https://www.judiciary.uk/wp-content/uploads/JCO/Documents/Speeches/lj-laws-speech-our-lady-of-common-law.pdf> accessed 21 April 2025.

[2] [1607] 12 Co Rep 63, 77 ER 1342 (KB).

[3] [1932] AC 562 (HL).

[4] Eliza Mik, 'Much Ado about Artificial Intelligence or: the Automation of Contract Formation' (2022) 30(4) International Journal of Law and Information Technology 484.

issues that are significant and novel for contract law.[5]

This article endorses the more pragmatic view and contends that contract law is doctrinally versatile and is capable of relying on existing doctrinal mechanisms, such as incremental development. It will not need extensive reform like a new legal personhood category or a revision of formation rules to cope with the challenges posed by algorithmic contracting. The article will additionally draw comparisons with other areas of private law and will argue that where contract law is unable to deal with certain challenges, other doctrines within the common law, found in areas such as tort law, may provide appropriate solutions. It will argue that the common law is defined by gradual development, and that reforming current doctrine will encourage an unsustainable model of legal adaptation. At a time of rapid technological development and expansion, a reliable and resilient legal system is of paramount importance to keep contractual parties protected.

II. The Recurring Cycle of Technology and Contract Law

To assess contract law's ability to adapt to new challenges, it is helpful to begin by examining how the common law has addressed comparable issues in the past. Academics such as Brownsword refer to the late 19th century and the notable changes made to tort, criminal and contract law in response to rapid industrialisation as justification for a 'bespoke regulatory

[5] Lauren Henry Scholz, 'Algorithmic Contracts' (2017) 20(2) Stanford Technology Law Review 128.

response' to contemporary challenges.[6] Therefore, it may be tempting to deduce that, since contract law has not grappled with algorithms that form and perform contracts before, there is a need for substantial legislative and regulatory reform. However, a closer analysis of tort law following the industrial revolution, for example, illustrates a considerably circumspect approach closely formed around established doctrinal principles. The seminal case of *Donoghue v Stevenson* arose in the context of the rise in heavily industrialised supply chains with numerous distributors, often leaving end consumers without any contractual relationship and no remedies against negligent producers or suppliers. The response to this emerging challenge was not a doctrinal overhaul, but rather a decision following an incremental line of cases, such as *Heaven v Pender*[7] and *George v Skivington*[8], to develop a duty of care through the 'neighbour principle'. *Donoghue* illustrates the longstanding mechanism of incremental development within the common law to deal with emerging challenges and demonstrates the ability of the common law to adapt to changing environments and circumstances.

Returning to contract law, one of the most significant periods in recent times was the rise of contracting through technology, where, for the first time, contracts were formed via the use of new methods of communication. In many of these cases, an incremental approach was once again critical to addressing the evolving challenges. A prime example of this is the line of cases following *Entores Ltd v Miles Far East Corporation*,[9]

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[6] Roger Brownsword, *Law 3.0: Rules, Regulation and Technology* (Routledge 2021) ch 4, 17–18.
[7] (1883) 11 QBD 503.
[8] (1869) LR 5 Ex 1.
[9] [1955] 2 QB 327 (CA).

which concerned whether the postal rule applied to instantaneous communications, such as telex messaging. These rulings illustrate a critical point about the general life-cycle relationship between technology and contract law, where initially every new development raises significant contractual anxiety, common law largely adapts, and the next technology raises significant concerns once again. In *Entores*, Lord Denning stated that a 'contract is only complete when the acceptance is received by the offeror: and the contract is made at the place where the acceptance is received',[10] ruling that it is insufficient for acceptance if a party only sent a telex; it must have been received. Lord Wilberforce subsequently introduced an element of flexibility in the later House of Lords case of *Brinkibon Ltd v Stahag Stahl GmbH,*[11] and clarified that 'no universal rule can cover all such cases: they must be resolved by reference to the intentions of the parties, by sound business practice and in some cases by a judgment where the risks should lie'.[12] This incremental approach was then extended to emails through the judgment by Blair J in *Thomas v BPE Solicitors*,[13] where he relied on the decisions in *Entores* and *Brinkibon* and stated that 'in my view the same principle applies to communication by email, at least where the parties are conducting the matter by email, as the solicitors were in this case'.[14] As seen through the judgment in *Thomas*, a pragmatist approach tethered to previous decisions with similar technologies or questions of law is the most efficient method for adopting emerging software-driven challenges.

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[10] *Entores* (n 10) 334.
[11] [1983] 2 AC 34.
[12] *Brinkibon* (n 12) 42.
[13] [2010] EWHC 306 (Ch).
[14] *Thomas v BPE Solicitors* (n 14) [86].

This recurring trend with technology is depicted throughout the development of contract law and is also notably seen with e-commerce, which raised significant concerns in the 1990s during the dotcom boom. For example, in 1999, Brownsword and Howells stressed that 'it will not always be straightforward for the law to implement or respond to the reasonable expectations of Internet contractors'.[15] Fast forward to 2026, and e-commerce is a universally accepted forum for contracting, achieving this without significant doctrinal reform. Contracts formed with a telex machine, emails, and e-commerce act as insightful case studies into how courts have addressed questions around the use of particular technology and illustrate how they successfully integrate them within wider contractual principles, such as offer and acceptance.[16] There is an evident trend that the common law responds to new technologies with reasoning by analogy, and forms an incremental line of cases with open-ended assertions, allowing courts to flexibly accommodate subsequent developments in the future.

We are now in a new cycle defined by AI, and the common law must not overstate the impact these technological developments will have on contract law. It should remain consistently grounded, given the long history of uncertainty that new technologies have raised for the common law and its demonstrated resilience. However, it is still true that the common law finds itself at the centre of an uncertain future as a result of the unfamiliar rate at which these technologies develop and their

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[15] Roger Brownsword and Geraint Howells, 'When Surfers Start to Shop: Internet Commerce and Contract Law' (1999) 19(3) Legal Studies 287, 287.
[16] Juliet M. Moringiello and William L. Reynolds, 'From Lord Coke to Internet Privacy: The Past, Present, and Future of the Law of Electronic Contracting' (2013) 72(2) Maryland Law Review 452, 455.

widespread impacts across different sectors and processes. Therefore, it is clear that consumers and corporations will need a reliable and dependable common law of contract to base their transactions on in the midst of this uncertainty. The common law must strike a crucial balance to avoid stalling progress while assessing which developments present wider risks. A process the common law has previously engaged through cases such as *J Pereira Fernandes SA v Mehta*,[17] concerning the adoption of e-signatures as a valid form of acceptance, where widespread general reform, like allowing an automatically inserted email address to act as a signature, was ruled to be impractical as it would have 'widespread and wholly unintended legal and commercial effects'.[18] However, later on, in cases such as *Golden Ocean Group Ltd v Salgaocar Mining Industries Pvt Ltd*[19] and *Bassano v Toft*,[20] this approach was refined to adapt to a new era of contracting where 'the conclusion of commercial contracts…by an exchange of e-mails…is entirely commonplace'[21] and accommodate new forms of e-signatures, such as those where 'the signature is made by the electronic communication of the words "I Accept".[22] A carefully calibrated approach is therefore necessary, one that protects established principles while allowing the law to adapt its scope to new developments and commercial settings. Despite reasonable concerns that AI presents a serious obstacle to contract law, these challenges must be mitigated cautiously to ensure the common law framework being developed

[17] [2006] EWHC 813, [2006] 1 WLR 1543.
[18] [2006] EWHC 813, [2006] 1 WLR 1543 [30].
[19] [2012] EWCA Civ 265, [2012] 1 WLR 3674.
[20] [2014] EWHC 377 (QB).
[21] Golden Ocean Group Ltd (n 19) [22].
[22] *Bassano* (n 20) [45].

is both progressive to new developments, while also being inoffensive to established doctrinal principles.

III. Contextualising Algorithmic Contracting

In the context of AI, a particularly important development for the common law is the formation and performance of algorithmic contracts. As defined by the European Law Institute (ELI), an 'algorithmic contract' means a 'contract where one or both parties use a digital assistant to automate some or all aspects of their contractual relations'.[23] Algorithms exist on a wide spectrum of automation, and algorithmic contracting is not exclusive to a single technology but is instead an umbrella term. Critically important in this definition is the involvement and usage of a 'digital assistant'. A versatile term, 'digital assistants' are currently assessed by academics through both (i) existing systems and (ii) reasonably foreseeable or hypothetical technological advancements. For example, Twigg-Flesner refers to existing applications such as Alexa, Siri and Cortana as 'digital assistants' and distinguishes them from futuristic applications such as a 'self-ordering fridge', which he refers to as 'digital delegates'.[24] Given the largely untraversed legal terrain of AI-driven disputes, the current landscape of algorithmic contracts today is formed from deterministic algorithms using preset parameters with largely

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[23] European Law Institute, 'Guiding Principles and Model Rules on Digital Assistants for Consumer Contracts' ('ELI DACC Model Rules, P-2022-28a, 2025) 13.

[24] Christian Twigg-Flesner, 'Consumers and Digital Delegates' in Larry A DiMatteo, Cristina Poncibó and Geraint Howells (eds), *The Cambridge Handbook of AI and Consumer Law: Comparative Perspectives* (CUP 2024) 75, 76.

consistent outputs from a particular input. As a result, much of the discussion around the impact of more advanced probabilistic algorithms, which could, for example, negotiate on behalf of two contracting parties, is speculative.

The key distinction between 'digital assistants' and 'digital delegates' is, one between deterministic AI and probabilistic AI, with the former 'based on programs written, or hand-coded by humans'[25] like optimised GPS navigation, and the latter 'commonly associated with terms like 'machine learning' or 'deep learning'[26] such as e-commerce recommendation systems based on previous purchases. Deterministic AI returns the same result when given a particular request without variance (A will always return B). In contrast, probabilistic AI responds differently to requests depending on the data it has and the context of the request (A may return B or C or even Z).

The lack of predictability in probabilistic AI is a major concern, as it is diametrically opposed to the universally accepted culture of English contract law, where parties desire clearly defined and predictable rules.[27] A new lack of predictability for commercial actors means similar complications for courts now presented with an intermediary tool that can take over decision-making and leave a contracting party with an outcome they did not want or expect. The natural assumption may therefore be that probabilistic AI is intrinsically more problematic to the status quo of contract law than deterministic AI. However, this article will argue that both forms of AI raise the same contractual concerns,

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[25] Mik (n 4) 494 – 495.

[26] Mik (n 4) 494 – 495.

[27] Rex Ahdar, 'Contract Doctrine, Predictability and the Nebulous Exception' (2014) 73(1) Cambridge Law Journal 39, 60.

with probabilistic AI's reputation as a more doctrinally difficult technology stemming from its ability 'to perform cognitive functions we associate with human minds'.[28] The root concern with both forms of AI remains the shared feature of a contracting party delegating what once were wholly human responsibilities to an entity that bears no direct liability. While the level of 'autonomy' in these AI forms is of reasonable significance, the recurring element of all AI contractual disputes is an algorithm failing to sufficiently execute a previously human-led responsibility; an error by an algorithm remains an error regardless of whether it came from a deterministic or probabilistic AI form. This article, therefore, relies on the limited deterministic AI caselaw there is and contends that courts can sufficiently adopt the same pragmatist approach seen so far as the use of probabilistic AI becomes more prevalent and litigation begins to arise.

It is also worthwhile to clarify the role that algorithms play in algorithmic contracts. Essential is the understanding that 'despite automating the transaction process to varying degrees, humans are never completely removed from the process'.[29] Algorithms take over elements of the contracting process from humans, often acting as an intermediary with human parties remaining on both ends of the contract. A commonly cited probabilistic AI example is a 'self-ordering fridge' which orders food when it detects that storage is running low, behind which would exist both a consumer and a supplier.[30] Forming a contract

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[28] Iria Giuffrida, 'Liability for AI Decision-Making: Some Legal and Ethical Considerations' (2019) 88(2) Fordham Law Review 439, 441.
[29] Eliza Mik, 'From Automation to Autonomy: Some Non-existent Problems in Contract Law' (2020) 36(3) Journal of Contract Law 205, 226.
[30] Twigg-Flesner (n 24) 76.

through a complete intermediary is considerably novel and, as Rizzi and Skead argue, 'the level of trust, dependence and deference that a contracting party places in the operation of the algorithm arguably gives rise to a *sui generis* (unique) form of [contractual] relationship'.[31] However, it is the characterisation of this relationship when a dispute arises that is central to the current legal debate. Particularly when an algorithm creates an outcome that one or both of the contracting parties did not foresee, and can no longer disassociate themselves, as the algorithm's role was central to the contract's formation and performance. Therefore, important questions are raised as to when a party may be able to separate themselves from something their employed algorithm did. Overall, the major considerations lie in the level of responsibility contractual parties should hold when algorithms err and how this will evolve as technology becomes more autonomous.

Lastly, before proceeding, it is helpful to construct a typology of potential problems an algorithm creates in the formation and performance of a contract. An algorithm can: (i) execute an authorised contract contrary to a party's intentions as a result of its data processing or its misconstrued understanding of the parties' objectives, both with and without defined parameters; (ii) execute an unauthorised contract and create an unconscionable bargain due to a programming error or a potential bug; or (iii) fail to execute a contract altogether and leave parties vulnerable as a result of the non-formation and performance of an expected contract.

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[31] Marco Rizzi and Natalie Skead, 'Algorithmic Contracts and the Equitable Doctrine of Undue Influence: Adapting Old Rules to a New Legal Landscape' (2020) 14(3) Journal of Equity 301, 323.

IV. The Common Law's Digital Resilience: Debunking the Hype

With the historical foundation and context now established, it is important to dissect the specific legal challenges posed by algorithmic contracting. As is the argument of this article, the conceptual concerns faced by courts so far in deterministic AI cases across common law jurisdictions have largely laid much of the doctrinal groundwork for future probabilistic AI cases, given the similar inherent challenges they pose for contract law. The concern around the use of AI in contracting stems from blurred lines around three critical areas of contract law: (i) attribution and liability; (ii) intention and consent; and (iii) predictability and transparency. The following sections attempt to demonstrate how these concerns are inflated and how probabilistic AI should cause no additional doctrinal concern when it begins to become the subject of litigation.

A. *Moffat v Air Canada* and the Attribution Question

Perhaps the most significant of all concerns is the question of who bears the liability for a contractual mistake when an AI errs in forming or performing a contract as intended. Given the autonomous nature of probabilistic AI, it is often suggested that it would be unreasonable to hold an AI's employer liable for something they have no direct control over. This is an unreasonable argument, as, for example, if an individual were to release a dog from a leash and it subsequently attacked someone, an offence would likely have been committed. The liability of

keeping a dog under 'proper control'[32] is attributed to its owner as the law recognises the position of power an owner holds over their dog. As a sentient being, a dog is clearly objectively more living and autonomous than AI, yet the courts will not hold the dog liable. Conversely, when probabilistic AI is employed by an individual or company, and something goes wrong, questions are raised on who should be held responsible, i.e., should the AI be given a separate legal personality distinct from its operators? While questions of 'legal personality' are more closely associated with probabilistic AI forms, the recent deterministic AI Canadian tribunal case of *Moffat v Air Canada*[33] demonstrates the argument that, although the two AI forms may drastically differ in their levels of autonomy, they raise the same kinds of legal questions.

Moffat is one of the few cases seen which concern a dispute at the heart of which is a form of deterministic AI. The case involves a chatbot providing incorrect information about the right to a retroactive claim of a bereavement fare, which raised eyebrows following Air Canada's claim that 'the chatbot is a separate legal entity that is responsible for its own actions'.[34] Tribunal Member Christopher Rivers described this as 'a remarkable submission',[35] clarifying that 'it should be obvious to Air Canada that it is responsible for all the information on its website'.[36] It demonstrates a clear scepticism from courts to treat deterministic AI as anything more than a tool employed by its

[32] Dangerous Dogs Act 1991, s 3(1).
[33] 2024 BCCRT 149.
[34] *Moffat* (n 33) [27].
[35] *Moffat* (n 33) [27].
[36] *Moffat* (n 33) [27].

user, as 'while a chatbot has an interactive component, it is still just a part of Air Canada's website'.[37]

The judicial reasoning is an optimistic display of courts adopting the simplest possible approach, where the attribution of liability should be allocated to an AI's employer. Comparisons can be drawn to the principle of vicarious liability in tort, where cases such as *Lister v Hesley Hall Ltd*[38] demonstrate that 'if [an employer] entrusts the performance of that duty to an employee and that employee fails to perform the duty, they are still liable'.[39] Instead of allocating liability to an AI or ceding to suggestions about prescribing AI with a legal personality, it is more doctrinally sound to adopt a more vicarious liability approach and consistently allocate liability to the employer of an AI. Such an approach would prevent the widespread risk of people and corporations using unconscious AI forms with legal personality to vicariously achieve questionable objectives and escape responsibility. Applying this straightforward approach simplified the judgment in *Moffat* and should continue to be applied in cases with the emergence of probabilistic AI software. The justification behind much of vicarious and enterprise liability is the philosophy that employers should bear the burden of a risk they take in the employment of an employee.[40] It would not follow for a company or an individual to reap the benefits of using an AI system and then absolve themselves of liability when a mistake arises. As Lord Toulson defines in *Mohamud v WM Morrison Supermarkets*

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[37] *Moffat* (n 33) [27].
[38] [2001] UKHL 22, [2002] 1 AC 215.
[39] *Lister* (n 38) [55].
[40] Phillip Morgan, 'Recasting Vicarious Liability' (2012) 71(3) Cambridge Law Journal 615, 618.

plc,[41] 'vicarious liability in tort requires, first, a relationship between the defendant and the wrongdoer, and secondly, a connection between that relationship and the wrongdoer's act or default'.[42] Absolving a contractual party from the liability of its algorithm, which has both a close connection to its employer and a potential wrongdoing, would be the equivalent of a factory owner employing workers and reaping the benefits of larger production, and then escaping liability when something goes wrong, because the workers fall under a separate legal category. In the context of algorithmic contracting, where a contracting party entirely relies on an algorithm to perform a contract on its behalf, there is a strong case in favour of this representing as close a connection as an employee, in this case an AI software, can have with its employer, the contracting party, as possible. As Lord Steyn states in *Lister*, 'the question is whether the [employee's] torts were so closely connected with his employment that it would be fair and just to hold the employers vicariously liable'.[43] In the context of algorithmic contracting, it would be unfair and unjust to allow AI employers to escape liability under the weak technicality of probabilistic AI holding a form of autonomy.

Having said this, the chatbot in *Moffat* is a non-autonomous deterministic AI and does not have machine learning capabilities. However, the question of attribution is largely identical across all AI forms. For example, if the common law is to adopt a vicarious liability approach, it holds that this approach will be largely identical regardless of the level of autonomy in question. In other words, an employed algorithm would be held liable for an error it

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[41] [2016] UKSC 11, [2016] AC 677.
[42] *Mohamud* (n 42) [1].
[43] *Lister* (n 38) [28].

makes through the same mechanisms and legal foundation in both probabilistic and deterministic forms. A possible comparative analogy is seen with large multinational corporations and small family-owned businesses. Regardless of their operating levels, vicarious liability for an employer is a possible outcome in the context of an employee committing a tort. Similarly, questions of attribution will likely not be different because an AI is more intelligent or less predictable. For now, however, *Moffat* acts as a signpost for the future of automation. It therefore seems clear that, arguably, the most significant concern raised by AI technology is quite simply resolved with a doctrinally conservative response inspired by principles of vicarious liability.

B. *Quoine Pte Ltd v B2C2 Ltd* and the Treatment of an Algorithmic Mistake

Algorithmic contracting also raises questions about whether the absence of human intention and consent can potentially undermine the validity of contracts, as it becomes difficult to determine the 'objective' meaning of contracts at the formation stage, where algorithms may be forming both the offer and acceptance, such as with two AIs employed to negotiate on behalf of contracting parties. Given that algorithms cannot be assessed for their outward conduct in the same way people can,[44] when an algorithm errs, the process of determining what an algorithm should have done or was meant to do is complicated, given the complexity in developing concepts such as a 'reasonable

[44] Mindy Chen-Wishart, 'Contractual Mistake, Intention in Formation and Vitiation: The Oxymoron of Smith v Hughes' in Jason W Neyers, Richard Bronaugh and Stephen GA Pitel (eds), *Exploring Contract Law* (Hart Publishing 2009) 341, 364.

algorithm'. This leads to arguments suggesting incompatibility with current doctrine, resting on the premise that a contract's terms need to look like they were agreed to by a party that can actually intend to agree, something two unconscious, coordinating algorithms cannot achieve due to the impracticality of assessing their outward conduct and words.[45] In this context, it is helpful to refer to the doctrine of objectivity, one of contract law's longest-standing doctrines.[46] Objectivity can be defined by the way in which the actions of parties are typically assessed by reference to their words and actions in contract law.[47] This principle stems from landmark cases such as *Smith v Hughes,*[48] which establish that contractual terms are formed from parties' outwardly manifested intentions and not their undisclosed subjective thoughts or intentions.[49] Objectivity is a critically important doctrine for contract law for two main reasons: (i) it is a central doctrine applicable to the entirety of contract law; and (ii) any area of contract law which undermines this doctrine will risk incompatibility when courts attempt to determine remedies for breach or vitiation.

In this context, for example, it can be difficult to determine which algorithm's intention is relevant and what an algorithm's objective conduct means when a contract may be vitiated due to a mistake. However, the primary concern is not whether algorithms have the capability of forming an intention or holding

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[45] Matthew Oliver, 'Contracting by Artificial Intelligence: Open Offers, Unilateral Mistakes, and Why Algorithms Are Not Agents' (2021) 2(1) ANU Journal of Law and Technology 45, 65

[46] See for example, *Anon* (1478) YB 17 Edw 4, Pasch fo 1, pl 2.

[47] Paul S Davies, *JC Smith's The Law of Contract* (3rd edn, OUP 2021) ch 2, 12

[48] (1871) LR 6 QB 597.

[49] *Smith v Hughes* (n 48) 607.

an objective meaning, but whether contracts can be vitiated when the relevant intention and objective meaning do not reflect that of an AI's employer. Once again, the challenge emerges from a contract being performed by a third-party, the algorithm, and not a contracting party directly.

Consequently, the question which needs to be answered is whose objective meaning is of significance in the context of an algorithm-driven and performed contract: is it the algorithm or the contracting party? This was a major point of discussion in *Quoine Pte Ltd v B2C2 Ltd,*[50] a commonly cited case from Singapore. It concerned a dispute regarding a series of incorrect Ethereum to Bitcoin trades made by automatic trading algorithms at the unconscionable level of '250 times the going market exchange rate',[51] in favour of B2C2. Singapore's Court of Appeal determined that despite the parties not knowing 'beforehand that the Trading Contracts would be entered into... these factors did not prevent the formation of a contract at the point of time when an offer made by one algorithm was accepted by the other'.[52] It is clear through Sundaresh Menon CJ's words that there is a continued reliance on an objective analysis of intention in the context of algorithmic contracting. Similarly, Menon CJ's observation that 'it is wholly artificial to work on the basis of what might have happened if a human element was involved'[53] reaffirms that no exceptions to the objective approach are made for algorithm-driven contracts, given the court's focus on the party's actual programmed acts, not their human intentions.

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[50] [2020] SGCA(I) 02.
[51] Quoine Pte Ltd v B2C2 Ltd (n 50) [2].
[52] *Quoine* (n 50) [96].
[53] *Quoine* (n 50) [87].

Quoine concerns a deterministic AI, and Menon CJ recognises this and states that 'where contracts are made by way of deterministic algorithms, any analysis ... must be done by reference to the state of mind of the programmers of the algorithms at the time of the programming'.[54] Designating responsibility to the individuals/company behind the algorithms applies the same logic as in *Moffat,* where the employers, or in this case the programmers, of an algorithm are to be held liable, as these machines are in effect carrying out actions that would have otherwise been fulfilled by a human, and therefore, it is the intention of those behind the algorithm that needs to be objectively assessed. It is also clear through the words of Thorley LJ, *Quoine's* trial judge in the Singapore International Commercial Court, that courts are also considering the expected significance of probabilistic AI, predicting that the law is likely to continue to adapt and that 'cases where computers have replaced human actions…will, no doubt, develop as legal disputes arise as a result of such actions'.[55] He suggests that 'this will particularly be the case where the computer in question is creating artificial intelligence and could therefore be said to have a mind of its own'.[56]

While probabilistic AI may introduce new questions, the most reliable solution to address the issue of intention is best dealt with similarly to deterministic AI forms, where the significance of the algorithm's involvement is disregarded, and an objective analysis is assessed through the AI employer's conduct at the time of contracting. While probabilistic AI may differ from

[54] *Quoine* (n 50) [97].
[55] *Quoine* (n 50) [206].
[56] *Quoine* (n 50) [206].

deterministic AI in that its outputs will be different for a particular input, there is no reason that the programmers, who can both be the contracting parties or separate from them, should hold any other form of responsibility due to the use of a different AI software. Where a company/individual develops their own programme, it is a risk they have chosen to take and simultaneously, where a company/individual uses a third-party software, that too is an optional risk taken. Comparisons can be drawn with cases such as *Davis Contractors Ltd v Fareham Urban District Council*,[57] where 'a builder who undertakes to finish a building by a certain day is, on the face of it, plainly taking such a risk'.[58] Similarly, whether a deterministic AI or a probabilistic AI is employed, it is not the responsibility of contract law to protect against the consequences of what may become an algorithm-driven bad bargain. Ultimately, they are both tools used by their employers and have outputs traceable back to a particular employer or programmer who bore the risk of an algorithmic error when they decided to pursue the formation of an algorithmic contract. *Quoine* demonstrates a doctrinally restrained approach which weaves algorithms within existing doctrinal structures, such as objectivity, and is an insightful exemplar for how more autonomous, probabilistic forms of AI should also be accommodated within existing doctrinal mechanisms when they give rise to litigation.

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[57] [1956] AC 696 (HL).

[58] *Davis Contractors* (n 57) 734.

C. *Ex p Software Solutions Partners (SSP) Ltd v HMCE* and Legal Clarity

Lastly, the driving force behind the concerns around probabilistic AI is the substantial increase in unpredictability it will bring in comparison to deterministic forms. The increased level of autonomy and the lack of preset parameters mean the algorithms can produce unexpected and unpredictable results without a baseline expectation to compare with. Perhaps one of the most significant concerns is the 'black-box problem'. As Bathaee defines it, 'the "black box problem" can be defined as an inability to fully understand an AI's decision-making process and the inability to predict the AI's decisions or outputs'.[59] This is due to complicated code, and the AI's probability-driven element, which can be next to impossible for humans to decipher or predict and raises concerns about when parties should cease to be liable for something an algorithm does. For example, probabilistic AIs designed to negotiate terms for an algorithmic contract may come to a financially unconscionable agreement, and once courts begin to assess that contract for vitiation, it may be impossible to assess what exactly the algorithms did and how they came to their conclusions, leaving courts with no clear direction as to how to remedy the dispute. Potential challenges such as these raise major concerns for predictability and transparency, threatening two major objectives of English law.

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[59] Yavar Bathaee, 'The Artificial Intelligence Black Box and the Failure of Intent and Causation' (2018) 31(2) Harvard Journal of Law and Technology 889, 905.

Traditionally, in deterministic AI cases such as the English case, *R (ex p Software Solutions Partners (SSP) Ltd) v HMCE*,[60] there are pre-set parameters governing the execution of AI, which provide courts with an element of predictability and a workable benchmark for when an algorithm acts outside of programmed parameters and what it should have done within them. *SSP* concerned a tax dispute arising from deterministic, automatically generated insurance contracts between insurance brokers and insurers. The judgment sustained the validity of automated contracts, stating that 'no further human intervention is necessary for the formation of a binding contract'.[61] However, especially important was the recognition that 'all the information necessary for electronic contract formation has been pre-programmed, according to strict parameters'.[62] While probabilistic AI presents an element of unpredictability, given that its use cannot be restricted to pre-set parameters, they still produce automatically generated results, formed following an input, and can still be used for the purpose of contract formation after receiving a set of instructions. An analogy can be drawn to how two free-thinking employees in a factory can produce the same product with different work styles. In this scenario, the factory owners assume the reputational and potentially financial risk of their employees' work and in theory, if one factory worker is 'smarter' or more efficient than the other, as probabilistic AI is over deterministic AI, the product produced is still a product, the same way a contract remains a contract. The concerns around predictability are best addressed by adopting an approach where contractual parties assume the risk of an algorithm erring, regardless of

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[60] [2007] EWHC 971 (Admin).
[61] *SSP* (n 60) [67].
[62] *SSP* (n 60) [20].

whether it is a deterministic or probabilistic form of AI they employed. The approach, as stated by Kenneth Parker KC, as he then was, was that 'the errors in question are failures by SSP to ensure that the computer software functions efficiently according to the parameters set'.[63] In a probabilistic AI context, a potential black box problem is likely another risk contractual parties will be expected to assume, amongst the many other risks, such as deciding to engage in a contract in the first place.

Consequently, with more autonomous forms of AI, such as Language Learning Models like OpenAI's ChatGPT, which by definition adapt beyond preset parameters,[64] the common law of contract is best suited to mitigate the risks of AI through contractual terms defining the course of action when an algorithm falters in executing the outcome contractual parties were expecting, or in cases where an AI is both forming and performing a contract, by defining what an unconscionable arrangement looks like. The lack of predictability and the high potential for errors in the use of probabilistic AI will present a series of new risks to contract law; however, through existing remedies, a standard contractual term which expresses how contractual parties will move forward in the instance their employed algorithms do something unpredictable, is a sufficiently simple solution. This approach may also aid in dealing with the rapid rate at which technology develops, occasionally in leaps so large that the law cannot immediately respond and will serve the purpose of allowing companies and businesses to specify for themselves how their chosen AI system or tool should act,

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[63] *SSP* (n 60) [21].

[64] Jakub Tomczak, 'Deep Generative Modeling: From Probabilistic Framework to Generative AI' (2025) 27(3) Entropy 238, 238.

directly counteracting concerns about programming variances across different AIs.

Additionally, beyond contract law, it may also be helpful to introduce similar expectations as those seen in product safety regulation and product liability in general. Such a development has been suggested by the European Law Institute, which recommends the enforcement of 'a legal requirement…as a design duty or similar, akin to product safety regulation'.[65] This would greatly limit the effects of the 'black-box problem' and, when supported by contractual remedies such as frustration, would ensure a holistic approach to mitigate the unpredictability of probabilistic AI by employing both by the ex ante nature of tort law, where product liability manages risk before harm occurs, and the ex post nature of contract law, where remedies and vitiation are sought after the realisation of a latent risk.[66] The outcome would be a common law framework, supported by regulation, which minimises the significance of the unpredictability concerns raised by algorithmic contracts formed with probabilistic AI. The common law of contract does not need a doctrinal overhaul to adjust from deterministic AI to probabilistic AI. It will instead need to develop a system which mitigates the new risks created by the emergence of probabilistic AI by building on the established principle of contractual parties

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[65] European Law Institute, 'EU Consumer Law and Automated Decision-Making (ADM): Is EU Consumer Law Ready for ADM? (Interim Report, 2023) P-2022-28, 31.

[66] Cullen O'Keefe, Ketan Ramakrishnan, Janna Tay and Christoph Winter, 'Law-Following AI: Designing AI Agents to Obey Human Laws' (2025) 94(1) Fordham Law Review 57, 116 – 123

assuming the risk in the employment of AI, as seen in deterministic AI cases such as *SSP*.

V. The Current Trajectory of Algorithmic Contracting

The common law has displayed evidence of its ability and resilience to cope with the challenges of algorithmic contracts. Concerns remain that if delays are made in addressing the present concerns, there may be difficulties in how effectively change can be demanded as new technologies develop.[67] These concerns suggest the need to act quickly and produce regulations that avoid major doctrinal reform. It is important to recognise that it will always take less time and put less pressure on courts to adhere to current legal doctrine than to deal with the hiccups and trial and error that can come with reforming contract law.[68] In this new world of exponential technological growth, the only thing more valuable than innovation is a stable and consistent contract law framework that provides certainty to all parties. An often-overlooked element of long-term development is that everything on the way must operate effectively, and few things are more conducive to progress than holding parties to account for their promises and protecting them from the misbehaviour of others.

While the common law can deal with the emerging challenges, regulation and supplementary legislation will certainly be beneficial in consolidating the law's approach to algorithmic contracting. Positive attempts at comprehensive regulation have

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[67] Jane K. Winn, 'Emerging Issues in Electronic Contracting: Technical Standards and Law Reform' (2002) 7(3) Uniform Law Review 699, 704.
[68] Giuffrida (n 28) 452.

been seen with 'The United Nations Commission on International Trade Law Model Law on Automated Contracting' (UNCITRAL Model),[69] which seeks to introduce a model aimed at decreasing the uncertainty raised by algorithms and harmonising the approach that nations take towards algorithmic contracting. A joint approach across the law and, more specifically, the common law will be imperative to ensure that contract law can enforce contracts with doctrinal consistency. It remains to be seen how legislation will adapt as probabilistic AI forms begin to permeate the economy in countless different sectors.

At all times, it must not be forgotten that within algorithmic contracting lies the future of contract. In what will be an incredibly fast-changing and rapidly evolving area of law, the common law is the primary legal mechanism with the capability to keep up and ensure the facilitation and enforcement of transactions formed and performed by algorithms. Where contract law is unable to offer immediately practicable solutions, other areas of private law, such as tort, can offer useful guidance in understanding the relationship between AI and its employers within the common law. It remains the most effective approach to continue finding ways to incorporate new technological developments through traditional doctrines, which will almost always be a more conducive way to ensuring the protection of essential legal values. An approach focused on prioritising the protection of doctrinal principles also serves the double purpose of only restricting the developments which raise genuine legal concerns and issues, thereby encouraging new technology and

[69] United Nations Commission on International Trade Law, 'UNCITRAL Model Law on Automated Contracting' (11 July 2024).

overall progress. The law should also not shy away from the support of other disciplines like ethics. As Sir Robin Knowles notes on AI, it is 'imperative that we take the opportunity for law and ethics to travel with it'.[70] The common law of contract has the tools to cope with the 'new world', as it has with every other 'new world' in the past.

VI. Conclusion

Overall, the current and limited deterministic AI case law illustrates that the common law has the tools to adapt to the concerns raised by algorithmic contracting as a whole. While it remains to be seen how courts address the inevitable challenges faced by more intelligent, probabilistic forms of AI, this article has argued that the challenges created for the common law of contract by the two different forms of AI are largely shared and that the approaches taken in cases of deterministic AI can be applied and replicated when probabilistic forms begin to appear before the courts. However, when dealing with the more confrontational challenges, such as the black box problem, the common law may need to occasionally rely on other private law doctrines, such as vicarious liability, to successfully come to doctrinally founded solutions. This article has asserted that where the common law can adapt, it is unnecessary to resort to extensive doctrinal and regulatory overhaul, as parties need a robust common law system to rely upon in a time of unprecedented development. Commonwealth courts across Canada, Singapore

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[70] Nick Hilborne, 'High Court judge: ethical and legal framework for AI "imperative"' (*Legal Futures*, 13 November 2018) <https://www.legalfutures.co.uk/latest-news/high-court-judge-ethical-and-legal-frame
work-for-ai-imperative> accessed 21 April 2025.

and the United Kingdom have been able to address complex issues of algorithms through common law rules without the need for extensive regulatory interventions in cases such as *Moffat*, *Quoine* and *SSP*. Further questions may lie in attempting to determine exactly how courts can produce a system which weaves together multiple private law doctrines to create an effective common law-driven response to address challenges such as the attribution of liability. The use of algorithms is a new medium for legal obligations that must be completely assimilated by the common law of contract.