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Artificial Intelligence and Unfair Competition – Unveiling an Underestimated Building Block of the AI Regulation Landscape

The article illustrates the underestimated role unfair competition law (UCL) can play as a building block of the regulatory landscape relating to artificial intelligence (AI). To this end, it examines to what extent overarching, prominent principles of AI regulation such as fairness, transparency, autonomy and innovation are reflected in paradigms of UCL, and on this basis evaluates how the latter can contribute to the realisation of the former. In this way, prominent problems raised by AI that are commonly discussed under different legal regimes are reconsidered from a UCL perspective, showing that this perspective may complement or even substitute traditional regulatory approaches. Finally, the article indicates how AI could inversely give an impulse to the doctrinal advancement of UCL as a still ambiguous and insufficiently understood body of law.

II. Setting the scene: what is AI, what is UCL, and what can the latter contribute to the regulation of the former?

AI and UCL are similar in that it is hard to say what they actually are. AI is a ‘catch-all’ term for certain new technologies revolving around big data analysis and advanced algorithms, comprising visions of ‘autonomy’ and ‘self-learning’. In demystifying technical terms for the purposes of this analysis, machine learning (as the most important and most prominent AI technology) will be considered as the main reference point. UCL is a less fashionable but similarly ambiguous phenomenon: a body of law first enshrined on the international level in Art. 10bis of the Paris Convention for the Protection of Industrial Property (hereinafter ‘UCL’) can and should play in the AI regulatory landscape has so far largely been neglected. Certainly, the fact that UCL is a complex matter – the understanding of which as an area of law in its own right is debated and the systematic location and design of which in the legal order varies widely across EU Member States, let alone worldwide – is an explanatory factor for this shortcoming. All the more, it seems worth bringing the potential of this body of law to the attention of legal orders that still have an underdeveloped focus on it. In order to fill this analytical gap, the present paper examines to what extent general principles widely proclaimed as key pillars and guiding paradigms of AI regulation are reflected in specific sub-equivalents stemming from the realm of UCL, thus illuminating UCL’s potential to contribute to their achievement. In analytical terms, a particular focus in the course of this assessment lies in reconsidering prominent problems raised by AI, which are commonly discussed under different legal regimes, from a UCL perspective – showing that this perspective may complement or even substitute traditional approaches. In substantive terms, special attention will be given to UCL’s contribution to the AI innovation ecosystem. Finally, on a reverse note, the potential of AI as an impulse for further developing the doctrinal framework of UCL and its relevance for the global order of competition will be considered.

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1 Although hinting at the Anglo-American legal sphere, the term ‘anti-trust’ is preferred in this analysis over ‘competition law’ in order to avoid terminological confusion vis-à-vis ‘unfair competition law’, since (from a European perspective) both regimes can be considered subsets of ‘competition law’, understood as an umbrella term.

2 But see for example WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI), Second Session, ‘Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence’ (21 May 2020) para 8: ‘No separate section concerning AI and unfair competition has been added. However, recognizing that IP law and competition law clearly relate, questions have been added in the various sections (…..)’.

3 Implications of AI for the legal order can be approached either from a ‘legalistic’ viewpoint, ie starting from the doctrinal framework of a specific legal regime, or from a ‘technological’/phenomenological viewpoint, ie starting from factual problems that arise in an economic, technological or societal context, cf Nicolas Petit, ‘Law and Regulation of Artificial Intelligence and robots: Conceptual Framework and Normative Implications’ (2017) 2 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2931339> accessed before 27 November 2020; both approaches are important and complement each other. This articles contributes to the ‘legalistic’ dimension; for a ‘technological’ perspective, see (from an IP angle) Josef Drexel and others, ‘Technical Aspects of Artificial Intelligence: An Understanding from an Intellectual Property Law Perspective’ (2019) Max Planck Institute for Innovation & Competition Research Paper No 19-13 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3465577> accessed before 27 November 2020.

4 For an overview on the technical functioning of ML and its relationship to adjacent AI technologies, see Drexel and others (n 3).
of 1883, which has historically been perceived as safeguarding the ‘morals’ or ‘business ethics’ in competition, relying on the ideal model of the ‘honourable merchant’. Modern scholarship construes UCL by taking recourse to functional economic considerations, postulating an ultimate complementarity with antitrust law and the protection of competition as an institution as a central goal.⁵

Still, the exact design and understanding of UCL rules varies considerably across EU Member States and worldwide: in systematic terms ranging from codifications in competition law to consumer law, public law or criminal law; in substantive terms oscillating between the protection of competitors, consumers and competition as an institution.⁶ Whereas the Business-to-Consumer (B2C) dimension of UCL has been harmonised in the EU via the Unfair Commercial Practices (UCP) Directive,⁷ the Business-to-Business (B2B) dimension so far has not.⁸ However, this ambiguity does not have to be a disadvantage as regards UCL’s potential for contributing to the AI regulatory landscape. Admittedly, given the divergences outlined, it will hardly have (immediate) benefits as regards the harmonisation of regulation. Yet, first, there may be gains arising from the idea of ‘regulatory competition’. Especially the fact that B2B UCL is not harmonised at the EU level should in this light be considered an opportunity. The regulatory landscape regarding AI is as dynamic as the technology it seeks to regulate. Competing national approaches on how to treat AI under UCL may be considered a ‘regulatory sandbox’⁹ in its own right: the best solutions found can then be exported into other jurisdictions – both on the legislative level and on the level of judicially interpreting general clauses via comparative legal methods. Second, on a related point, the inherent and characteristic flexibility of UCL, which ultimately unites the understanding of all legal orders having such a body of law, fits very well with the dynamic nature of the AI field. UCL can play a viable role as a ‘fall-back’ regime to address new and unforeseen competitive risks in the absence of specific legislation. This fall-back character, creating fertile ground for doctrinal developments that can later be explicitly codified, belongs to the traditional traits UCL is known for.⁴⁰ It gains even more relevance in the digital economy.

Now, to what extent may AI regulation principles be reflected in UCL paradigms? The debate about the regulatory framework for AI is dynamic and ongoing, and it is certainly too early to speak of an established acquis. Nevertheless, a certain consensus regarding overarching and recurring paradigms, reflected both in academic debate and numerous policy guidelines of public as well as private institutions, can be identified. Among the principles invoked over and over again are an overall realisation of ‘ethics’, fairness, transparency, accountability, autonomy and the promotion of innovation.¹¹ The following considerations will shed light upon ways in which specifically UCL can contribute to achieving these goals.

III. ‘AI ethics’ and ‘business ethics’: the (non-) convergence of regulatory chimeras

To start with, one can generally reflect on whether there might be a connecting line between the widely proclaimed wishes for ‘AI ethics’¹² and the notion of ‘business ethics’ often or at least historically associated with UCL. This point obviously goes to the very heart of the debate on what UCL is all about. In its historical roots, as already mentioned, it used to be the area of law addressing the ‘ethics’ of and in competition.¹³ Whereas this understanding has to a large extent been overridden by the modern, economic-functional approach, fragments of the old understanding still permeate laws, judgments and scholarly debate, with varying emphasis from Member State to Member State. If one were to follow the notion that there is still a place for ‘business ethics’ within the legal order and that this place is UCL, then aligning the respective principles with the demands for ‘ethical AI’ does not seem far-fetched. The stance of this article, however, is not to promote this claim, but rather to point out the dire need for a demystification of the ‘ethics’ narrative. First and foremost, there is hardly an ‘ethical’ value without a ‘legal’ mirror image, in particular a fundamental or human right relating to the respective value,¹⁴ which makes the whole notion of ‘ethics’ more confusing than helpful for the purposes of legal scholarship. Second, oftentimes conduct that may be deemed ‘unethical’ converges with anticompetitive conduct. In any case, it appears clear that only those parts of ‘AI ethics’ relating to or impacting on markets and competition can gain relevance in the realm of UCL. Ultimately, when it comes to concrete legal operationalisation, all such issues, irrespective of their metaphysical provenance, come down to a balancing of

⁵ cf Reto M Hilty, ‘The Law Against Unfair Competition and its Interfaces’ in Reto M Hilty and Frauke Henning-Bodewig (eds), Law Against Unfair Competition – Towards a New Paradigm in Europe? (Springer 2007) 1; Rupprecht Podszun, ‘Der ‘more economic approach’ im Lauterkeitsrecht’ [2009] WRP 509.
⁶ For an overview, see Frauke Henning-Bodewig, International Handbook Of Unfair Competition (CH Beck/Hart/Nomos 2013); illustrative of the scattered nature, Richard Arnold, ‘English Unfair Competition Law’ (2013) 44 IIC 63, 77: ‘It is still the case that English law does not recognise any general tort of unfair competition. It does not...’
⁷ Directive 2005/29/EC of the European Parliament and of the Council concerning unfair business-to-consumer commercial practices in the international market.
⁸ As far as the B2C dimension is concerned, this article will focus on European law; as far as the B2B dimension is concerned, on German law as an illustrative and doctrinally advanced example or blueprint.
⁹ On regulatory sandboxes for data sharing, cf Rupprecht Podszun, ‘Datenpools: Ausprobieren statt differenzieren’[2019] WUW 289.
¹⁰ cf Herbert Zeich, Information als Schutzgegenstand (Mohr Siebeck 2012) 161 f.
¹¹ cf only High-Level Expert Group on Artificial Intelligence, ‘Ethics guidelines for trustworthy AI’ (2019) <https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai> accessed before 27 November 2020; OECD, ‘Council Recommendation on Artificial Intelligence’ (2019) <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449> accessed before 27 November 2020; this list of values is by no means exhaustive, yet these appear to be the most prominent ones.
¹² cf High-Level Expert Group (n 11); IEEE, ‘Ethically Aligned Design – A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems’ (2019) <https://standards.ieee.org/standard/standards/web/documents/other/ead1e.pdf?utm_medium=undefined&utm_term=undefined&utm_content=undefined&utm_campaign=undefined&undefined> accessed before 27 November 2020.
¹³ It is worth noting, however, that now as before, irrespective of the moral rhetoric and underpinnings, the practical application of the law has often followed a functional balancing of interests.
¹⁴ cf High-Level Expert Group (n 11) 37, however, considering fundamental rights a mere sub-realisation of ethics.
legitimate interests of all market participants. Such balancing lies at the doctrinal heart of UCL. The following considerations will thus embrace legal, not ‘ethical’, reflections.

IV. Fairness

The prima facie most obvious, yet at the same time most complicated potential ‘common ground’ of AI and UCL is the ‘fairness’ principle itself. On the surface, the ‘fairness’ of UCL and the ‘fairness’ invoked in the AI context might be perceived as having little in common apart from terminology: whereas ‘fairness’ in the AI debate is mostly understood as referring to the principle of equality and the prohibition of ‘biased’ discrimination, the ‘fairness’ of UCL is teleologically entrenched in safeguarding competition or at least competition-related interests. However, not only do both concepts share an inherent openness and vagueness. One also should not overlook the many negative impacts that the (mis)use of AI can have, specifically on competition. Whereas this is primarily exemplified in antitrust scenarios such as ‘algorithmic collusion’, there are also manifold instances of AI impacting areas traditionally associated with the realm of UCL, especially those related to ‘consumer protection’. Examples will be provided below. However, the distinct feature of UCL’s general clause(s), prohibiting ‘unfair’ commercial practices, is of course the capability of solving new and unforeseen anticompetitive risks, which for logical reasons evade further elaboration in this article.

While this is not the place to delve deeper into the ongoing and long-standing debate about the substantive meaning of ‘fairness’ (or rather: the manifold dimensions it entails), one very concrete aspect of UCL’s contribution to a ‘fair’ market order is worth highlighting: its regulatory complementarity to antitrust law. In substantive terms, UCL is equipped to address competition problems that fall short of the antitrust requirement of market dominance. This is all the more relevant in light of the difficulties associated with determining market power in data-driven markets.

Of course, heeding doctrinal systematics, one has to be cautious not to circumvent or undermine conclusive decisions of antitrust law as to the non-illegality of certain conduct exacted by a non-dominant player through referring to UCL. Yet, especially if one follows the ‘modern’ understanding of UCL that puts safeguarding competition as an institution at the centre of teleological attention, its general clauses can serve as a building block for addressing AI-induced market failures outside the realm of antitrust.

V. Transparency

Transparency is a core mantra of AI regulation. Both the involvement of AI as such (as opposed to purely human decision-making) and the concrete way AI reaches a decision (commonly labelled the ‘black box’ problem, mirrored by efforts to achieve ‘explainable AI’) are widely desired to be transparent. Now, transparency comes in many forms, but an important one is definitely market transparency. The traditional systematic realm of safeguarding market transparency is UCL, which prohibits misleading commercial practices. Under the respective doctrinal test, it is ultimately decisive whether the origin of a decision is algorithmic or human, and whether this has an impact upon consumers’ commercial decisions.

1. AI-based personalisation

Among the main and economically most valuable areas of AI application is its use for strategies of personalisation, notably personalised pricing and personalised advertising. A fierce debate has evolved around whether such personalisation strategies should be banned or limited, even in the event that they are overall welfare-enhancing, on the grounds that they are widely perceived by consumers as ‘unfair’ or ‘unjust’. Without going deeper into that discussion, one thing appears undisputed: it is essential for the consumer to know that he or she is subjected to a personalisation strategy and not receiving a standard offer. To the extent the consumer is not acting on the basis of an autonomous and informed decision, personalisation may thus violate transparency rules imposed by UCL. Especially a lack of price transparency constitutes

20 Of course, the feasibility of transparency in the latter regard ultimately depends on the technological state of the art, cf Deven Desai and Joshua Kroll, ‘Trust But Verify – A Guide to Algorithms and the Law’ (2017) 31 Harvard Journal of Law & Technology 1.

21 cf Section 1, arts 6 and 7 UCP Directive.

22 cf Benjamin Raue and Antje von Ungern-Sternberg, ‘Ethische und rechtliche Grundlagen der Datenschutzrechtlichen Verarbeitung von Kundeninformationen’ (2020) ZDR 49, 52.

23 On personalised advertising see Guido Noto La Diega, ‘Data as Digital Assets. The Case of Targeted Advertising’ in Mor Bakhoun and others (eds), Personal Data in Competition, Consumer Protection and Intellectual Property Law – Towards a Holistic Approach? (Springer 2018) 447. The extent to which such personalisation actually happens in practice remains dubious, cf OECD Secretariat, Personalised Pricing in the Digital Era (2018) <https://www.oecd.org/document/DAF/COMP/WD(2018)146/en/pdf/> accessed before 27 November 2020; further empirical research is needed in this area.

24 See on this debate Christopher Townley, Eric Morrison and Karen Yeung, ‘Big Data and Personalised Price Discrimination in EU Competition law’ (2017) King’s College London Dickson Poon School of Law Research Paper No 2017-38 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3048688> accessed before 27 November 2020; Gerhard Wagner and Horst Eidenmüller, ‘Down by Algorithms? Siphoning Rents, Exploiting Biases, and Shaping Preferences: Regulating the Dark Side of Personalized Transactions’ (2019) 86 University Of Chicago Law Review 371, 387.

25 On the respective regulatory potential of UCL, see Pich and Loderer (n 18) 33; Wagner and Eidenmüller (n 24) 590; cf also the pre-contractual information duty on personalised pricing on the basis of automated decision-making according to art 4(9)(a)(b) Directive (EU) 2019/1261.

26 cf Helga Zander-Hayat, Lucia Reich and Christine Steffen, ‘Personalisierte Preise – ein verbraucherpolitische Emordnung’ (2016) 1967, 1969.
an informational asymmetry detrimental to economic welfare by eradicating the possibility of comparing prices, which is essential for competition. Of course, the exact information requirements are subject to debate: they have to be balanced in order not to evoke an ‘information overload’, and they have to be construed in light of what (including which extent of AI use) is to be reasonably expected or common in a specific social or business context, and which ways and means of fulfilling the information duty are adequate vis-à-vis the medium of the commercial communication in question.

2. Further instances of AI-related marketing

Beyond personalisation, there are further instances where UCL can resolve transparency problems of AI-related marketing activities. First, in light of the ambiguity surrounding the term ‘AI’ as such, one could consider the marketing of ‘normal’ computer software under the catchy promise of AI a misleading practice. Second, companies increasing proclaim codes of conduct relating to AI, in which they make more or less concrete statements as to the way in which they intend to use AI for the good of society and refrain from undesired behaviour. Such codes can be considered part of the ‘corporate digital responsibility’ phenomenon as a digitised continuance of ‘corporate social responsibility’. In case a company acts contrary to its statements in such a code, UCL plays an important role in combating the deception lying therein and rescuing market transparency. For if companies want to employ their ‘good conduct’ as a competitive advantage vis-à-vis consumers who value such behaviour, competition on these grounds can only function if the promises made are actually kept. The main problem in the application of the law in this regard is the vagueness of many statements. For example, one can hardly draw consequences from promises such as using AI in a ‘socially beneficial’ way as such.

Third, another body of cases that may increasingly gain relevance stems from the realm of intellectual property law and relates to the necessity of distinguishing whether an intangible good, especially one that looks like a ‘work’ in the copyright sense, has been created by humans or with considerable help from AI. The question whether considerable human guidance is essential for the justification of IP protection for ‘AI-generated’ output has kept and will further keep IP scholars busy. Yet what is sure is that any legal distinction between human-made and ‘AI-generated’ subject matter faces the practical challenge of having to discern the respective origin. A market solution, relying on consumers valuing human-made works over AI-generated ones, does not work if one actually cannot be told from the other. If an AI-generated ‘work’ is marketed as human-made, such marketing, be it actively or under passive concealment of AI origin, may constitute an act of unfair competition: a misleading practice.

VI. Accountability

Ensuring the accountability of companies for damages ‘autonomously’ caused by their AI is the most ‘classic’ legal problem relating to AI. The prime example is the autonomous car running over pedestrians. Yet AI might also ‘autonomously’ harm intellectual property rights or competition in general. In the case of UCL, the issue at stake is to determine liability for unfair commercial actions committed ‘by’ or with the help of the AI of a company. The need for a holistic concept with respect to such ‘attribution issues’, unifying the somewhat fragmented doctrinal landscape revolving around ideas such as ‘secondary liability’ into a coherent framework, has rightly been emphasised in the recent scholarly debate. When construing such framework specifically with a view to AI, rather than starting from scratch and inventing entirely new concepts, it appears wise to build on the "acquis,"
i.e. the manifold role models various legal regimes have already developed in the field of liability attribution. UCL can be one of these doctrinally inspiring regimes.

In Germany, the concept of ‘liability for breaches of duty of care in competition’ has been developed on the grounds of the UCL general clause as an alternative in particular to the ‘Störrerhaftung’ of IP law.41 It provides doctrinal guidelines for attributing anticompetitive acts to a company by way of making the company responsible for not having fulfilled its duties to prevent the respective act. Developed and advanced especially in and for internet constellations, the model particularly entails standards for the scope and ‘reasonableness’ of respective measures, including the extent to which they encompass duties to prevent identical or similar infringements in the future.42 Transferring this concept as a potentially adequate role model to AI-induced violations of antitrust law has already been proposed.43 It may contribute valuable structures, precedents and reference points to the attribution debate, enhancing both legal certainty and the achievement of economically sound trade-offs between commercial freedom on the one hand and prevention of harm on the other hand. Ultimately, in light of the nexus between adequate liability and innovation, this issue can also be viewed as a contribution of UCL to fostering AI innovation, an aim that will be further elaborated in section IX. below.

VII. Autonomy

The ultimate threat of AI, if we follow science fiction-inspired notions, is its potential to replace humans. Conversely, preserving human autonomy lies at the core of AI regulation principles.44 UCL builds on and aims at safeguarding a very important sub-aspect of human autonomy: the autonomy of consumers as participants in the market, who make the very concept of competition work in executing their ‘role as arbitrator’. The problems raised by AI in relation thereto are twofold.

1. Autonomy threats of AI use by suppliers

The use of AI on the supply side, in particular for personalisation strategies, basing new offers and advertisements solely on previous preferences, may capture consumers in a ‘filter bubble’. Autonomous choice from a variety of market options may get lost in the course of proliferation of such preference-tailored systems. Yet the good news is that UCL generally supplies the means to address such threats: as already mentioned, transparency requirements at least mitigate the tension.45 Consumers voluntarily and informedly entering into or staying in filter bubbles exact an autonomous choice to do so, although the paradox and dangers of voluntary self-incapacitation are well known. In this capacity, UCL appears to be the competition-oriented sub-pillar of fighting the overarching ‘filter bubble’ problem.46

2. Autonomy threats of AI use by consumers

(Even) more problematic is the mirror dimension of AI use by consumers, especially when relying on Internet of Things (hereinafter ‘IoT’) applications, for which the term ‘algorithmic consumers’ has been coined.47 An example is the ‘autonomous fridge’ in the ‘smart home’, which orders new food (based on previous preferences) without the human consumer being (actively) involved. Whereas on the one hand such use may constitute a welcome ‘fight fire with fire’ counter-strategy vis-à-vis the detrimental use of AI by companies, restoring the technical and informational balance, it may at the same time, from an anthropological perspective, deprive consumers of their very capability of acting as rational market agents, since ‘all’ of their decisions are taken over by their AI tools.48

As regards UCL’s potential answer to this threat of its very foundations, a doctrinal acceptance of and adjustment to ‘algorithmic consumers’, meaning in particular a reconstruction of the ‘average consumer’ standard, seems necessary,49 but insufficient to address the autonomy problem. Rather, as in other fields of law, it would probably be necessary to ‘keep the human in the loop’. The fridge, for example, might be forced to check back on the consumer from time to time to ask whether preferences have changed or a new offer might be of interest. Such an obligation would generally have to be realised outside UCL. Nonetheless, UCL, with its rich experience in matters of consumer choice, may provide theoretical guidelines for policymakers to assess how much decisive power can be delegated to ‘algorithmic consumers’ and how much cannot without undermining the functioning of the market order as such. In particular, UCL doctrine can in this regard influence the debate on implementing the respective parameters by design.50

VIII. UCL as an enforcement tool for AI-related extra-UCL market conduct rules?

1. Locating UCL in the enforcement landscape

UCL can act as an (additional) enforcement pillar for a variety of market conduct rules outside UCL, the violation of which negatively impacts competition, via the doctrine of ‘breach of statutory duty’. On procedural terms, this option unleashes the enforcement possibilities

41. cf German Federal Supreme Court, 12 July 2007, I ZR 18/04 – Jugendgefährdende Medien bei ebay.
42. cf Ansarg Ohly, ‘§ 8 UWG’ in Ansarg Ohly and Olaf Sosmitz (eds), Gesetz gegen den unlauteren Wettbewerb (7th edn, CH Beck 2016) para 127.
43. cf Moritz Hennemann, ‘Künstliche Intelligenz und Wettbewerbsrecht’ [2018] ZWeR 161, 180 f.
44. cf only High-Level Expert Group (n 11) 12; OECD (n 11) IV.1.2.a).
45. cf section V.1. above; Wagner and Eidenmüller (n 24) 190 on personalised pricing: ‘An obligation to disclose the application of first-degree price discrimination appears innocuous and potentially effective to leverage consumer autonomy.’
46. A parallel problem regarding ‘filter bubbles of opinion’ threatening democracy is debated in the media law realm, cf Jure Globocnik, ‘Bedrohung der Meinungsvielfalt durch Algorithmen’ [2017] ZUM 329.
47. cf IEEE (n 12).
48. cf the concerns articulated by Josef Drexl at the ‘Consumer Law Days 2019’ conference, reported by Jure Globocnik and Stefan Scheuerer, ‘Datenzugang, Verbraucherinteressen und Gemeinwohl – Bericht über die Verbraucherrechtsstage 2019 des Bundesministeriums der Justiz und für Verbraucherschutz in Berlin’ (2020) 11 JIPITEC 228, 229.
49. The ‘average consumer’ standard, against which misleading practices are judged, is not only challenged by personalisation phenomena that question the very concept of ‘average’ (cf Peter Rott, ‘Der „Durchschnittskonsument“ – ein Auslaufmodell angesichts personalisierten Markentyps?’ [2013] Vol 163). Also, with a view to ‘algorithmic consumers’, a ‘technicised’ reconstruction of this hypothetical figure as ‘average algorithmic consumer’ may become necessary.
50. cf IEEE (n 12).
via competitors and consumer associations, which the UCL of many legal orders relies on, thus providing for an institutional enrichment beyond the state authorities associated with antitrust law. Such enforcement is quicker and more flexible than long administrative proceedings and thus displays characteristics especially fit for AI and the digital economy. On substantive terms, ‘breach of statutory duty’ appears an apt doctrinal vehicle for operationalising the ongoing discussion about a growing convergence of areas of law relating to the protection of consumer interests in the digital economy. Among the numerous breaches of law that can potentially be sanctioned via these mechanisms, three appear especially relevant in the AI context: discrimination, protection of personal data and cybersecurity.\footnote{The phenomena of discrimination and personal data protection can be seen in conjunction with the personalisation problem outlined above, as personalisation can be based on data gathering in violation of data protection rules, and if the personalisation relies on traits protected by anti-discrimination law prohibits referring to, such as race or gender. Although these aspects are at the outset grounded in non-economic values such as human dignity and personality, they still shape and limit the way companies act on the market.}

\section*{2. AI-based discrimination in market-relevant contexts}

Anti-discrimination legislation is the standard against which to legally judge ‘AI bias’ issues. Although anti-discrimination rules are not 	extit{as such} rules relating to market conduct, as required for coming within the ambit of UCL, they can 	extit{be} in certain contexts. An obvious example is again the above-mentioned personalisation strategies in commercial contexts, namely in case personalisation is based on traits anti-discrimination law prohibits referring to, such as race or gender. Although these aspects are at the outset grounded in non-economic values such as human dignity and personality, they still shape and limit the way companies act on the market.

\section*{3. Competition and privacy: Friends or foes?}

The most fundamental concrete threat raised by AI for society is its capacity to establish all-embracing surveillance, both by the state and by private companies.\footnote{As opposed to the more far-reaching sci-fi dystopias circling around the discourse.} It is thus key to align strong data protection rules with the market- and welfare-oriented economic goals that are pursued by competition rules.\footnote{In this regard it is worth highlighting that both welfare and data protection are collective societal interests, cf Indra Spiecker genannt Döhmann at the Consumer Law Days 2019 in (n 48) 233.} A fierce debate on the relationship between competition and data protection law has been sparked by investigations of the German competition authority Bundeskartellamt against Facebook, alleging an abuse of a dominant position based primarily on a breach of data protection rules.\footnote{cf Marc Amstutz, ‘Dateneigentum’ (2018) 218 Aep 438, 520, diagnosing the threat of ‘algorithmic governmentality’ based on big data gathering (although not considering data protection laws the correct or sufficient remedy).} At the same time, there is a discussion on whether data protection violations can be sanctioned as a breach of statutory duty under UCL.\footnote{In this regard raised by AI for society is its capacity to establish all-embracing surveillance, both by the state and by private companies.} If one follows the above-mentioned idea of a teleological complementarity between antitrust and UCL, considering them two bodies of law essentially aimed at the very same target of safeguarding functioning competition (or maximising welfare), then it seems crucial to discursively align these two strands of discussion and construe them in conjunction.\footnote{While from an antitrust perspective, the test is whether the conduct in violation of data protection rules can be considered as falling within the established categories of an ‘exploitation’ of customers or an ‘impediment’ of competitors by a market dominant actor, in UCL terms a violation of a market conduct rule and a considerable effect on the (competition-related) interests of the market participants are required. Yet the uniting issue in both dimensions appears to be to what extent data protection rules either have an inherent connection to competition or which competition-specific ‘plus’ is required for deriving harm to competition from a breach of data protection law.} While from an antitrust perspective, the test is whether the conduct in violation of data protection rules can be considered as falling within the established categories of an ‘exploitation’ of customers or an ‘impediment’ of competitors by a market dominant actor, in UCL terms a violation of a market conduct rule and a considerable effect on the (competition-related) interests of the market participants are required. Yet the uniting issue in both dimensions appears to be to what extent data protection rules either have an inherent connection to competition or which competition-specific ‘plus’ is required for deriving harm to competition from a breach of data protection law.\footnote{The answer to this question is complex, and the reflections are ongoing. Yet there are some theoretical guideposts this article wants to highlight: First, the efforts to understand ‘privacy’ as an economic good and thus integrate it within economic welfare theories need to be further pursued and advanced. This way, privacy as a central consumer interest of the digital economy might eventually be captured as part of ‘consumer welfare’. According to a widespread line of thinking, this is the normative standard competition laws should pursue, and at the same time this standard is considered to be in need of reconstruction and adaption to the digital age. Second, the doctrinal 	extit{acquis} regarding conceptual overlaps of privacy/personality\footnote{Welfare theory is ultimately about the (pareto-)optimal allocation of goods: if privacy can be understood as a good that has to be optimally allocated, it may well be included in an overall welfare doctrine spanning both competition and data protection law; on the economics of privacy, see Alessandro Acquisti, Curtis Taylor and Liad Wagnman, ‘The Economics of Privacy’ (2016) 54 Journal of Economic Literature 442; pessimistic, Bertin Martens at the Consumer Law Days 2019 (n 48) 231, considering the economic value of privacy still being insufficiently understood and economics thus being of little help for balancing welfare with data protection interests; optimistic, Ryan Calo, ‘Privacy and Markets: A Love Story’ (2016) 91 Notre Dame Law Review 649.} and intellectual property should be integrated into the discussion; both regimes are, although with varying emphases, embedded in both the scope of this paper, as it gives no guidance on the substantive relationship between data protection law and competition law.}
economic and personality-based justifications as the basis for rights in intangible subject matter, while at the same time the understanding of the relationship between IP and competition law seems far more advanced than between privacy and competition law.\(^{62}\) Third, quite likely the result of such reflections will in any case be a hybrid character of data protection rules, comprising some elements that can be subjected to economic paradigms and others that cannot.\(^{63}\) Fourth and finally, notwithstanding these horizons of teleological pluralisation and overlaps, a basic systematic dividing line must be heeded: where there is no harm to competition, data protection cannot and should not be enforced via competition regimes purely on the grounds of ‘enforcement assistance’.\(^{64}\)

### 4. Cybersecurity

Cybersecurity is of key importance for the functioning of and trust in AI and IoT ecosystems. The ‘autonomous car’, which needs to be prevented from being hacked, again furnishes an illustrative example. While the legal theory of cybersecurity still appears in its infancy, its character as a set of market conduct rules seems rather undisputed.\(^{65}\) Liability under UCL in case of violation of such rules can act as an (additional) incentive for companies to adequately safeguard the respective standards.\(^{66}\)

### IX. The contribution of UCL to the regulatory framework for fostering AI innovation

Another key promise of AI is that it fosters innovation. UCL can contribute to an innovation-enhancing legal framework in at least three dimensions, which are to be outlined in the following.

#### 1. Data access on UCL grounds

Data access is key for AI innovation. Especially ‘machine learning’ heavily relies on data. The debate on access to such data has advanced quite far over the last couple of years.\(^{67}\) Yet only rarely has the option of enforcing data access regimes from the realm of UCL been considered in the discussion.\(^{68}\) If data access interests can be located in realms traditionally associated with UCL, they should be located there and not elsewhere for reasons of systematic coherence.\(^{69}\) Yet, in addition, the potential of UCL to act as an innovative ‘catch basin’ for competition-related issues for which no other systematic realm is intuitively or prominently compelling or in sight should be explored.\(^{70}\) A UCL approach could address access issues both relating to the B2B and the B2C dimension, and does not seem to require explicit legislation de lege ferenda,\(^ {71}\) although this would certainly have benefits for legal clarity. Rather, for the time being, UCL’s general clauses could ‘do the job’.

First, horizontal claims could result as a consequence of a ‘deliberate obstruction of competitors’, which in German UCL is an established ‘small general clause’ for B2B conduct that is deemed unfair according to an overall balancing of interests.\(^ {72}\) As one such interest, in light of the fundamental rationales of UCL, one could highlight the overall one of functioning markets and competition. The advantage would especially be that market failure could be remedied in instances where there is no dominant position in the sense of antitrust law.\(^ {73}\) Market failure in the context of data access is multi-faceted and not limited to instances of abuse of monopoly power.\(^ {74}\) This should also be seen against the backdrop of the discussion on potentially ‘exporting’ the concept of ‘relative market power’ anchored in German antitrust law (Sec. 20 Act against Restraints of Competition), which has no equivalent on the European level, but is potentially of considerable relevance for regulating the digital economy.\(^ {75}\)

It does not appear compelling to base such considerations, should other jurisdictions consider adopting them, in antitrust; rather, a valid option is construing them as systematic hybrid phenomena under UCL as well. In substantive terms, some kind of power asymmetry (yet below

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62 On the relationship between privacy and intellectual property, cf Diana Liebenau, ‘What Intellectual Property Can Learn from Informational Privacy, and Vice Versa’ (2016) 30 Harvard Journal of Law and Technology 283; on a historical side note, it seems illustrative to recall that the influential German scholar Josef Kohler once considered the whole body of (B2B) UCL as protecting the ‘personality interests’ of companies, cf Josef Kohler, Der unlängstere Wettbewerb (Rothschild 1914) 17 ff; one can still reflect on whether to locate in particular trade secrecy interests purely in the realm of economics, to view them from an IP angle, or to theorise them in conjunction with privacy and ‘corporate personality’ paradigms.

63 cf the differentiation by Francisco Costa-Cabral and Orla Lynský, ‘The Internal and External Constraints of Data Protection on Competition Law in the EU’ (2015) LSE Working Papers 23/2015, 3, assuming that ‘EU data protection norms may impose both an internal and an external constraint on the application of competition law’.

64 Against an expansionist use of breach of statutory duty in non-market related contexts, see generally Angar Ohly, ‘§ 3a UWG in Angar Ohly and Olaf Sonnitz (n 42) para 21; anyway, the rather strong enforcement regime of the GDPR has mitigated the need of externally assisting the formerly ‘toothless tiger’ data protection law.

65 For a comparative law overview on the legal framework, cf Dennis-Kenji Kipker and Sven Mueller, ‘International Regulation of Cybersecurity – Legal and Technical Requirements’ (2019) MMR – Aktuell 414/29.

66 cf Thomas Riehm and Stanislaus Meier, ‘Rechtliche Durchsetzung von Anforderungen an die IT-Sicherheit’ (2020) MMR 571, 574 f.

67 But see in this vein Drexl (n 48) 237.

68 See the proposal of Drexl at the Consumer Law Days 2019 (n 48) 237 and 238; in detail, Josef Drexl, ‘Connected Devices – An Unfair Competition Law Approach to Data Access Rights of Users’ (2020) Max Planck Institute for Innovation and Competition Research Paper No 20-22 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3746163> accessed before 31 December 2020.

69 On the value and necessity of locating claims in the fitting legal regime, see the discussion at the Consumer Law Days 2019 (n 48) 238; from the perspective of applicable law, Drexl (n 68) 42.

70 On this feature of UCL, see section II. above.

71 But see in this vein Drexl (n 48) 237.

72 § 4 No 4 UWG (‘gezielte Behinderung’); this doctrinal option was first brought to my attention by an oral statement of Matthias Leistner.

73 On the antitrust framework for data access, cf Josef Drexl, ‘Designing Competitive Markets for Industrial Data’ (2017) 8 BIPTEC 257, 280 ff; under a UCL approach, it is also conceivable to draw on the antitrust criteria the CJEU has established in its ‘essential facility’ doctrine (cf Case C-418/01 IMS Health ECJ EU:2004:237) as a starting point and then develop them further, duly heeding differences and specificities; on FRAND principles as a potential role model for data access, cf Heiko Richter and Peter R Slowinski, ‘The Data Sharing Economy: On the Emergence of New Intermediaries’ (2019) 50 IIC 4; in any case, aligning the ‘fairness’ element of FRAND with a claim based on unfair competition law appears apt at least on the terminological surface.

74 For an overview of potential market failures relating to data access, see Bertin Martens, ‘Data Access, Consumer Interests and Social Welfare: An Economic Perspective’ (2016) 88/2016, 357 ff; in another vein, the ‘common data user’ access regime in the context of B2B conduct under section 4 of the German 籠 Benger law has been critically commented on by the German Federal Cartel Office (Bundeskartellamt) (2020) <https://papers.ssrn.com/sol3/papers.cfm> accessed on 06 April 2022.

75 cf Heike Schweitzer at the Consumer Law Days 2019 (n 48) 231; Drexl (n 68) 33, 36, 41.
the dominance threshold) would probably (co)direct the reference point for intervention. 76

Second, especially regarding the access desires of consumers, UCL appears the ideal systematic place, as its B2C dimension is commonly categorised as belonging to the realm of ‘consumer protection law’. 77 To the extent access corresponds with portability, a UCL-based portability regime could be theorised in conjunction with the role model of Art. 20 GDPR under a common vision of digital consumer welfare. As regards the substantive standard for granting such access, it has been proposed to rely on the necessity of certain data for the optimal use of a connected device and structure the claim as a ‘claim to portability’ that goes even beyond portability. 78

2. UCL and the ‘AI & IP’ discourse, part 1: Market-sensitive investment protection

While the whole academic world seems to be talking about traditional IP, especially copyright and patent protection, for AI and its outputs, 79 the protection of the respective subject matter via UCL has received little scholarly attention. 80 It is time to fill this void. 81

a) Protecting AI innovation via UCL: Practical perils and theoretical horizons

A long and controversial discussion revolves around the extent to which protection against the imitation of an intangible subject can be granted on UCL grounds in parallel or in addition to given IP law. The concrete design of such doctrines varies across EU Member States and internationally. 82 Whereas a traditional background prohibited – beyond UCL-specific cases such as deceptive imitations – ‘slavish’ or ‘parasitic’ imitation of ‘moral’

76 cf Martin Peitz and Heike Schweitzer, ‘Ein neuer europäischer Ordnungsrahmen für Datenmärkte?’ [2018] NJW 275, 280, encouraging the development of case groups of ‘data-related exclusionary conduct’ in B2B relationships beyond market dominance constellations.

77 See Drexl (n 48) 237; arguing that the constellation resembles the rules of advertising, a traditional key realm of UCL; comprehensively, Drexl (n 68) 40 ff; see also Jörg Hoffmann and Begoña Gonzalez Otero, ‘Demystifying the Role of Data Interoperability in the Access and Sharing Debate’ (2020) Max Planck Institute for Innovation & Competition Research Paper No 20-16, 20 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3705217> accessed before 27 November 2020.

78 According to Drexl (n 48) 238, it appears ‘fair’ to grant data access to consumers who need such access in order to use their device in an economically sound manner; consumer access needs in the IoT, cf also Drexl (n 68); Josef Drexl, ‘Data access and control in the era of connected devices’ (2019) <https://www.beuc.eu/publications/beuc-x-2018-121_data_access_and_control_in_the_area_of_connected_devices.pdf> accessed before 27 November 2020.

79 cf Jyh-An Lee, Kung-Chung Liu and Reto M Hilty (eds), Artificial Intelligence and Intellectual Property (OUP 2021) (forthcoming); Ryan Abbott, ‘I Think Therefore I Invent’ (2016) 57 Boston College Law Review 1079; Ana Ramalho, ‘Will robots rule the (artistic) world?’ (2017) 21 Journal of Internet Law 15; Annemarie Bridy, ‘Coding Creativity’ (2012) 5 Stanford Technology Law Review 1.

80 But see Tim W Dornis, ‘Artificial Creativity: Emergent Works and the Void in Current Copyright Doctrine’ (2020) 22 Yale Journal of Law and Technology 1, 25 ff; Tim W Dornis, ‘Der Schutz künstlicher Kreativität im Immateriälschutzrecht’ [2019] GRUR 1252, 1256 f; Daniel Gervais, ‘Emerging Legal Issues between Big IP and Artificial Intelligence’ (2019) 10 JIPITEC 3, 19 para 84; Drexl (n 73) 270 para 62.

81 Trade secret protection as a hybrid regime between IP and UCL will be considered separately in section IX.3. below.

82 In the Anglo-American sphere, they appear as ‘misappropriation doctrine’, which is to some extent comparable to continental European UCL approaches, but very narrowly construed, cf Tim W Dornis, ‘Artificial Creativity’ (n 80) 26 ff.

83 This ‘moral’ rhetoric still resonates in the French terminology of parasitisme.

84 See Hilly (n 5); Ansgar Ohly, ‘A Fairness-Based Approach to Economic Rights’ in Bernt Hugenholtz (ed), Copyright Reconstructed (Wolters Kluwer 2018) 83; Annette Kär, ‘What to Protect, and How? Unfair Competition, Intellectual Property, or Protection Sui Generis in Nari Lee and others (eds), Intellectual property, unfair competition and publicity: convergences and development (Edward Elgar 2014) 11, 27 ff; Ansgar Ohly, ‘The Freedom of Imitation and Its Limits – A European Perspective’ (2010) 41 IIC 506, 522.

85 See on this danger Drexl (n 73) 270 para 63.

86 cf Drexl (n 73) 278 para 112: ‘This however questions the very appropriateness of a property approach to regulating that economy. IP systems are largely based on the paradigm of protecting intangible assets, such as technologies in particular, that play a role as input in the production of physical goods. Such a paradigm does not seem to fit a world in which consumers have to rely on real-time and accurate information as an input.’

87 cf Rupprecht Podszun, ‘Der „more economic approach” im Lauterkeitsrecht’ [2009] WRP 509, 317.
been found a welfare-endangering problem of IP law.\textsuperscript{89} This becomes all the more pertinent in the AI context, which is characterised by very dynamic production cycles that are hard to align with abstract protection terms.\textsuperscript{90} Also, protection can be tailored to the needs of a certain industry, i.e. to respond to sector-specific dynamics of AI.\textsuperscript{91}

As regards the feature of conduct-reliance, a common problem in the AI and IoT realm is the difficulty surrounding both the definition\textsuperscript{92} and the allocation\textsuperscript{93} of subject matter of protection. In such dubious instances, it seems a viable ‘way around’ to rather look at the welfare effects of conduct, shifting the problem from the realm of the technical to the realm of the economic.\textsuperscript{94}

Furthermore, the economic-functional characteristics of UCL seem especially fitting for the protection of ‘AI-generated’ intangible goods. The problematic cases of interest for legal academic debate are characterised by the absence of notable human effort or guidance.\textsuperscript{95} Thus, the market focus of UCL seems an especially suitable regulatory match. Protecting the personality and interests of human ‘creators’ (understood in a wide sense, not limited to copyright) has always been a key justification for granting intellectual property rights.\textsuperscript{96} Yet in the absence of humans whose interests have to be given weight in the balancing exercise, with ‘inventors’ replaced by ‘investors’,\textsuperscript{97} a not only ‘more’ but ‘purely economic approach’ to such constellations on the doctrinally apt grounds of UCL appears an appropriate framework.\textsuperscript{98} In each case, one would have to investigate who made relevant investments and if their recoupment is endangered by free-riding. On a legal theory note, one could thereby uphold a differentiation between an anthropocentrically construed, ‘classic’ intellectual property law in the continental European droit d’auteur tradition on the one hand, and a purely economic market regime for AI on the other hand.\textsuperscript{99}

c) An alternative to new IP rights in instances of uncertainty about market failure

Coming to the lex ferenda dimension of UCL considerations, UCL has been traditionally attributed a ‘pacsedriver function’, meaning that protection has been granted on UCL grounds before the respective doctrines eventually materialise into a full-fledged IP right.\textsuperscript{100} This feature should be kept in mind when reflecting on potential new protection regimes, especially for computer-generated ‘works’, but also for data or ML models.\textsuperscript{101} As long as it is simply unclear whether there is an economic need for introducing such rights, i.e. whether there is market failure in need of remedy,\textsuperscript{102} it seems wise to refrain from hastily and prematurely establishing new and potentially dysfunctional full IP rights. Rather, one could thoroughly monitor how things develop, gather economic evidence and insights, flexibly grant protection on UCL grounds, and codify the parameters established in this course once a constant need for protection has materialised.\textsuperscript{103} Of course, the economic costs of potentially dysfunctional market intervention on uncertain grounds\textsuperscript{104} have to be weighed against those of legal uncertainty in the absence of the respective evidence, the whole market failure standard ultimately comes down to an uncertain market intervention on uncertain grounds.

89 Of course, this goes with the caveat that the ‘romantic’, anthropocentric understanding of IP has to a certain extent been overridden by industry-determined market realities, see Hilty, Hoffmann and Scheuerer (n 37) 27.

100 On the ‘pacsedriver function’ of UCL vis-à-vis introducing new intellectual property rights, see Zech (n 10) 161 f; Ohly (n 84) 522 f; Kurr (n 84) calls UCL an ‘incurbaor’ for new IP rights; emphasising the ‘interim’ character of a UCL solution in the AI context, Dornis, ‘Artificial Creativity’ (n 80) 44; Dornis, ‘Der Schutz künstlicher Kreativität im Immaterialgüterrecht’ (n 80) 1252.

101 cf Céline Castets-Renard, ‘The Intersection between AI and IP: Conflict or Complementation?’ (2020) 51 IIC 141, 142; ‘...the law maker may be led to consider that a sui generis system of IP rights for AI-generated inventions should be raised to adjust innovation incentives for AI; in favour of new IP regimes, Dornis, ‘Der Schutz künstlicher Kreativität im Immaterialgüterrecht’ (n 80) 1257 and 1264.

102 Outlining the context-dependency of market failure regarding AI outputs as opposed to not identifying market failure regarding AI tools, Hilty, Hoffmann and Scheuerer (n 37) 15 ff; considering market failure failure possible regarding training data, Philipp Hacker, ‘Immaterialgüterrechtlicher Schutz von KI-Trainingsdaten’ (2020) GRUR 1025, 1033; assuming an economic need for protection, Dornis, ‘Der Schutz künstlicher Kreativität im Immaterialgüterrecht’ (n 80) 1264; yet all authors acknowledge the lack of clear empirical evidence. Absent such evidence, the whole market failure standard ultimately comes down to an allocation of the burden of proof or burden of justification, with the option of either the status quo or the freedom principle as a starting point.

103 Critical on the introduction of new IP rights for trained AI, Zech (n 97) 1146: ‘Any reaction of IP law beyond jurisprudence and interpretative guidance has to be handled with care. New investment protection rights should only be introduced if otherwise a clear market failure is to be expected. In the area of artificial intelligence, this seems not to be the case’; on the sufficiency of (inter alia) UCL with regard to protection of AI data, cf also Peter R Slowinski, ‘Rethinking Software Protection’ (2020) Max Planck Institute for Innovation & Competition Research Paper No 20-17, 18 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3708110> accessed before 27 November 2020.

104 Dysfunctional effects of IP in the data economy are especially identified as regards the database sui generis right, see Matthias Leistner, ‘The Emerging European IP Rights System and the Data Economy – An Overview With Particular Focus on Data Access and Portability’ (2020) 13 ff <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3625712> accessed before 27 November 2020.

For a critical assessment of the technological state of the art vis-à-vis scholarly ‘autonomy’ assumptions, see, however, Darja Kim, ‘AI-Generated Inventions: Time to Get the Record Straight?’ (2020) GRUR International 443.

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of a clearly defined right, and against those associated with the lack of harmonisation of B2B UCL.

**d) The need to fine-tune doctrinal requirements vis-à-vis the needs of the digital economy**

Lastly, as regards the concrete application of UCL protection, the need to fine-tune doctrinal requirements of the assessment should be highlighted. Specific criteria common in legal orders can be categorised in two strands: first, on historical and systematic grounds, they materialise as ‘specific unfairness’ parameters aligned with other traditional paradigms of UCL, in particular confusion over origin as a problem of market transparency, or means of knowledge gathering related to breach of trade secrecy. Second, they can serve as functional equivalents to IP protection thresholds, such as the German doctrine of requiring subject matter to exhibit ‘competitive originality’ (wettbewerbliche Eigenart). This criterion has always remained dubious, and, as it relies on paradigms of *visuality*, its suitability is additionally challenged in digital contexts. Yet such criteria, within the boundaries of legal methodology, are generally open to flexible development by courts and scholarship, and they should be developed accordingly with a view to the needs and characteristics of the digital economy. Ultimately, their goal must be to give, on a more concrete level of abstraction, guidance to courts for operationalising the market failure assessment. In this context, if one combines the notions of data access regimes on UCL grounds on the one hand (see section IX.1. above) and data protection regimes on the other hand, an integrated UCL approach bears the potential of progressively contributing to finding the widely sought optimal balance between access and protection. UCL could provide the breeding ground for considering totally new approaches from scratch. A concrete area of relevance seems to be giving an impulse for reform of the database *sui generis* protection right: the calls for such reform are getting more and more nuanced, and they include the finding that data protection and data access need to be seen in conjuncture when forming a new and adequate regime.

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105 Highlighting the problem of legal uncertainty when relying on UCL protection, Hacker (n 102) 1032, criticising UCL as ‘rather shaky ground for the protection of industrial data’, Andreas Wiebe, ‘Protection of industrial data – a new property right for the digital economy?’ [2016] GRUR Int 877, 879; considering UCL ‘patchy at best’, Dorns, ‘Artificial Creativity’ (n 80) 59.

106 Dorns, ‘Der Schutz künstlicher Kreativität im Immaterialgüterrecht’ (n 103) 1260; Wiebe (n 105) 879.

107 In Germany, for example, such criteria are codified in an explicit norm of the German Act against Unfair Competition (§ 4 No 3 UWG), while there is a long-standing discussion on whether circumstances further protection can be granted on the grounds of the general clause (cf Aqsoar Ohy, ‘Hartplatzhelden.de oder: Wohin mit dem unmittelbaren Schutzrecht?’ (2013) GRUR 1227, 30) considers ‘deceptive and goodwill-appropriating conduct’ as lying at the heart of misappropriation prevention in European and civil-law UCL.

108 cf Maximilian Becker, ‘Lauterkeitsrechtlicher Leistungsschutz für Daten’ [2017] GRUR 346, 347 f.

109 On the difficulties of applying ‘competitive originality’ to non-visual contexts, see Maximilian Becker, ‘§ 64 Lauterkeitsrechtlicher Leistungsschutz für Daten’ in Wolfgang Gloy, Michael Loschelder and Rolf Danckwerts (eds), *Handbuch des Wettbewerbsrechts* (5th edn, CH Beck 2019) 47 ff.

110 cf Lester (n 104) 17 f; Drexel (n 68) 45.

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3. **UCL and the ‘AI & IP’ discourse, part 2: Application to AI components**

When concretely applying these considerations to AI, it appears apt to structure the assessment along the steps of the machine learning process, i.e. training data, learning process and output. A substantive evaluation of market failure regarding these phenomena lies beyond the scope of this paper. Rather, it aims to illuminate some abstract doctrinal paradigms for meeting potential market failures.

**a) Training data**

Starting with training data, applying UCL protection to data in general has been discussed for quite some time, in particular as an alternative approach to or argument against the introduction of a new property right in data. Consequently, UCL can also constitute a means of protection against the misappropriation of a specific sub-phenomenon of data, namely AI training data, meaning protection against the creation of another AI model by using the same training data as a competitor. The trait of temporal dynamism has led scholars to compare data with fashion, and correspondingly to consider the dynamic legal protection of fashion under UCL a role model for the legal protection of data. The assumption goes that both are of high value, but short-lived, so that at least registered IP rights seem inappropriate for optimal protection. Whether one considers these parallels convincing or not, in any (and every) case the specific economic features of AI training data, in particular the investments needed to generate or obtain them, have to be taken into account. As far as the assessment further depends on the above-mentioned doctrinal requirements of the respective legal order, it is in particular debated...
whether data exhibit ‘competitive originality’, and it is assumed that in most cases they do not.\textsuperscript{129}

\paragraph{b) Algorithms and models}

Coming to protection for AI algorithms, a technical and a legal distinction have to be made: the optimisation algorithms on the basis of which a model is trained constitute classical software \emph{to the extent} they are written in computer code,\textsuperscript{120} whereas algorithms as \emph{such} never fall under IP protection. Thus, not only is their treatment under copyright and patent law the same as regarding classical software,\textsuperscript{122} but the usual paradigms of UCL protection for software also apply.\textsuperscript{122} In this regard, it is worth noting that the fashion argument outlined above has also been made regarding computer programs.\textsuperscript{123} These can generally be protected under UCL,\textsuperscript{124} yet conclusive decisions of copyright and patent law as to the scope of their (non-)protection must be heeded, which leaves little room for the practical relevance of UCL in light of given IP protection for these phenomena. The case is more complex for trained AI models, i.e. the actual AI tools: whether or to what extent such models, including the ‘weights’ they comprise, are subject to protection under copyright and patent law is debated,\textsuperscript{125} with especially their dynamic, changing nature potentially altering traditional IP paradigms. Thus, on the one hand, one may consider the relevance of UCL \emph{greater} as compared to optimisation algorithms since, due to its conduct-based flexibility, the application of UCL to trained ML models could flexibly address market failure in these uncertain contexts.\textsuperscript{126} On the other hand, if models do not fall under IP software protection, then this decision should generally not be circumvented or overridden by UCL protection.

\paragraph{c) Output}

Lastly, as regards AI-generated output, heading the systematic decisions of IP law must again be the key directive for applying UCL. As already mentioned above, its potential relevance lies especially in cases where IP protection for AI-generated output is \emph{not} given due to the lack of a human author, inventor or designer.\textsuperscript{127} Yet whether this lack is systematically deliberate or accidental remains ambiguous: ‘AI-generated output’ was simply not imaginable at the time the respective laws were enacted, an argument that can be turned one or the other direction.\textsuperscript{128} In any case, two developments relating to AI-generated intangible goods need to be closely monitored: first, empirical economic insights into the market structures in order to identify market failure or its absence; second, the legal theory discussion on the impact the lack of human involvement could have on the IP paradigm of ‘public domain’.\textsuperscript{129}

\section{4. The UCL dimension of trade secret protection}

Lastly, the UCL dimension of trade secret protection can act as a legal theory cornerstone for regulating the AI economy. In the EU, trade secret protection has meanwhile been codified as a separate body of law.\textsuperscript{130} Yet it still has roots in and references to UCL, in particular when relying on an ‘(un)fairness’ standard as the subsidiary general clause of infringing acts.\textsuperscript{131} Trade secret protection is an important building block in the AI/IP protection landscape.\textsuperscript{132} Data, algorithms, models and outputs can all be protected as a trade secret.\textsuperscript{133} Notwithstanding certain welfarist ambiguities,\textsuperscript{134} the European trade secret regime is widely praised as a balanced and adequate system with regard to the optimal trade-off between exclusivity and access.\textsuperscript{135} This is attributed \emph{inter alia} to the UCL-inspired, flexible, conduct-based approach it adopts.\textsuperscript{136} Instead of a full-fledged property angle,\textsuperscript{137} the regime was constructed as a

\begin{thebibliography}{99}
\bibitem{119} Discursive, Christoph Ziegler and Nikolas Smurra, ‘Fallsbrüche bei Big Data-Anwendungen’ [2013] MMR 418, 421; very critical also Hacker (n 102) 1032.
\bibitem{120} cf Zech (n 97) 1146.
\bibitem{121} Ibid.
\bibitem{122} In this context, it should be noted that the correct doctrinal realm for locating software protection has always been debated and the introduction of a ‘sui generis’ right been discussed as an alternative, cf Reto M Hilty and Christophe Geiger, ‘Patenting Software? A Judicial and Socio-Economic Analysis’ (2005) 36 IIC 615, 643 f; Slowinski (n 103) 9 ff; Hacker (n 102) 1032.
\bibitem{123} On the comparability of fashion and (traditional) computer programs under UCL, see Deck (n 88) para 163.
\bibitem{124} As with data, the established requirements of the doctrinal acquis, at least under German law, may pose some problems. As far as ‘competitive originality’ is understood as an indication of origin, it is doubtful to what extent computer programs in general and AI models in particular can be considered to display such character. Also, the traditional visual element associated with this notion hardly fits computer programs, cf Deck (n 88) para 159.
\bibitem{125} cf Slowinski (n 103) 16 ff; Begoña Gonzalez Otero, ‘Machine Learning Models Under the Copyright Microscope: Is EU Copyright Fit for Purpose?’ (2020) Max Planck Institute for Innovation & Competition Research Paper No 21-02 https://ssrn.com/abstract=3749233 accessed before 31 December 2020; Patrick Ehinger and Oliver Steimerl, ‘Die urheberrechtliche Schutzfähigkeit von Künstlicher Intelligenz am Beispiel von Neuronalen Netzen’ [2018] CR 2018 761.
\bibitem{126} cf Zech (n 97) 1146, pointing at the possibility of UCL protection for trained AI.
\bibitem{127} cf Zech (n 97) 1146; Dormis, ‘Der Schutz künstlerischer Kreativität im Immaterialgüterrecht’ (n 80) 1256 ff.
\bibitem{128} Dormis, ‘Der Schutz künstlerischer Kreativität im Immaterialgüterrecht’ (n 80) 1257 identifies a ‘gap’ of IP law regarding this issue.
\bibitem{129} cf Maurice Kop, ‘AI & Intellectual Property: Towards an Articulated Public Domain’ (2020) 29 Texas Intellectual Property Law Journal https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3409715 accessed before 27 November 2020.
\bibitem{130} Directive (EU) 2016/945 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure.
\bibitem{131} cf Drexel (n 78) 97; ‘Here, the Directive integrates EU trade secrets protection into a broader unfair competition law framework.’
\bibitem{132} Josef Drexel and others, ‘Comments of the Max Planck Institute for Innovation and Competition of 11 February 2020 on the Draft Issues Paper of the World Intellectual Property Organization on Intellectual Property Policy and Artificial Intelligence’ (2020) 9 <https://pure.mpg.de/rest/items/item_3193085_2/component/file_3193086/content> accessed before 27 November 2020.
\bibitem{133} cf Tanya Aplin, ‘Trading Data in the Digital Economy: Trade Secrets Perspective’ in Sebastian Lohsse, Reiner Schulze and Dirk Staudenmayer (eds), Trading Data in the Digital Economy: Legal Concepts and Tools (Nomos 2017); specifically on trade secret protection for AI training data, Hacker (n 102) 1032.
\bibitem{134} The effects of trade secret protection on AI innovation are ambivalent insofar as on the one hand, the regime provides some extent of exclusivity, thereby protecting investments and safeguarding innovation incentives, while on the other hand, it also creates obstacles vis-à-vis third parties that want to use e.g. certain data to train their ML models.
\bibitem{135} Leistner (n 104) 18 ff.
\bibitem{136} Drexel (n 73) 269 para 56: ‘... such further limited protection can be considered as better suited to serve the purposes of the data economy, by focussing on the particular way in which a third party has specifically accessed access to the data instead of granting exclusive protection against the use of data’.\textsuperscript{137} ibid 291, para 182: ‘Rather than recognising exclusive control over any use of protected information, as would be typical for intellectual
doctrinal hybrid between IP and UCL, uniting the ‘best of both worlds’. By these virtues, the trade secret directive can be considered a concrete materialisation of the overall legal theory features of a UCL approach outlined above. Not least for the sake of legal coherence, it follows that trade secret protection and UCL should not be considered separate worlds, but (still) understood and interpreted with a mutual view to one another. After all, the explicit reliance of the TS Directive on UCL standards also bears the potential to revitalise UCL as an area of interest and importance and to give an impulse to refuel the European harmonisation discourse regarding its B2B dimension.

X. Conclusion and outlook

It has been shown that UCL will have a viable role to play in shaping the contours of a market order increasingly determined by AI. It can in numerous ways contribute to the achievement of central regulatory paradigms aiming at the optimal utilisation of this new technology for the good of society. Thereby, UCL can and should not only take a passive role of reacting and adjusting its established standards, but by the virtue of its doctrinal flexibilities proactively partake in developing the new standards required to address the manifold challenges AI raises. At the same time, legal issues induced by AI provide the occasion to further reflect on and refine the nature and core of UCL as a still insufficiently understood body of law. Due to its characteristic flexibility, UCL displays an extraordinary reliance on and responsiveness to societal, economic and technological changes. Such changes are currently and for the time to come significantly driven by artificial intelligence. UCL may in this way be considerably reshaped and advanced as a genuine building block of regulating the digital economy, competitive order and society.

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