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Jyh-An Lee, Reto M. Hilty, and Kung-Chung Liu, eds.
Elisabeth Kasznar Fekete

INTERNATIONAL TRADEMARK ASSOCIATION

675 Third Avenue, New York, NY 10017-5704

Telephone: +1 (212) 642-1700

email: wknnox@inta.org

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BOOK REVIEW

By *Elisabeth Kasznar Fekete**

Artificial Intelligence and Intellectual Property. Jyh-An Lee, Reto M. Hilty, and Kung-Chung Liu, eds. 2021. Pp. 449. \$120. Oxford University Press, Great Clarendon Street, Oxford, OX2 6DP, United Kingdom.

While technology continues to impact our daily routine in an increasingly accelerated manner, programming capabilities, language models, and mathematical command systems are trying to recreate human intelligence by developing abilities capable of identifying standards in data compilations—and these efforts are already producing and promising even greater and faster developments. The evolution of artificial intelligence (“AI”) facilitates access to data, automating not only mechanical but also cognitive tasks, and creates ever more available information as well as technological solutions in the social, legal, economic, human resources, and business arenas. At the same time, substantial challenges are generated by AI “neural nets” (i.e., “neural networks”) in all fields. Intellectual property (“IP”) lawmakers and professionals have been raising significant questions, such as the following: (i) who is the inventor of innovations or the creator of artistic, literary, dramatic, musical, or scientific works developed using generative AI; (ii) to what extent are data privacy rights preserved in new automation technology scenarios; and (iii) how might the prosecution and enforcement of intellectual property rights (“IPRs”) be affected.

Addressing these questions and many others of high complexity through reflections on the transformation, impact analysis, and studies of current and future models, *Artificial Intelligence and Intellectual Property* compiles nineteen interconnected chapters in seven parts. The book is written by twenty-five authors, who are scientific researchers from various countries, such as Brazil, China, Germany, Japan, Saudi Arabia, Singapore, Switzerland, Taiwan, the United Kingdom (the “UK”), and the United States. With undeniable expertise and a large variety of experiences as law professors, lawyers, physicians, computer science specialists, technology law consultants, and more, the contributors approach the subject matter with a broad diversity of perspectives on the

* Senior Partner, Kasznar Leonardos Intellectual Property, Member, International Trademark Association. Ms. Kasznar Fekete is a member of *The Trademark Reporter* Committee.

influence of AI in the IP field. The authors' ongoing points of discussion will be, if not summarized, at least briefly referred to in this review.

Despite the limitations faced by any analysis of the matter in view of the constant development of new AI technologies, the well-constructed chapters bring to the reader an enriched perspective of the rationale behind the impacts of AI use that already exist or that are or expected to affect the categories of IP law, among which the book addresses patents, trademarks, and copyrights. The book also addresses the ramifications of the issues involved on software, unfair competition, antitrust law, and database protection.

Because the book is the result of cooperative work between Asian and European academic institutions, it does not aim to highlight any particular jurisdiction. According to its editors, although it “might have distinctly Asian and European touches,”¹ the authors' purpose is “to elucidate the general challenges and opportunities faced by every jurisdiction in the era of AI.”² In sum, since the matter is debated in the book under a dynamic international dimension, the reader is invited to reflect on the rationale of the repercussions of AI, including AI's social impacts and its impacts on investments. The reader is also invited to learn how to strategically use AI.

The road map promised in the editors' introduction—“Roadmap to AI and Intellectual Property: An Introduction”—is provided along the way by research exploring three main themes that unify the chapters by setting out common essential lines of observation:

- (i) the innovation capability increased by AI and how IP creations are positively affected by automation;
- (ii) the increase of negative repercussions faced by the use of AI, such as the availability and dissemination of products subject to protection by IPRs, creating an opportunity for the proliferation of counterfeit works implemented through AI; and
- (iii) solutions for IP-related issues involving AI, such as the lack of specific regulations for its implementation regarding technological and artistic creations in some jurisdictions.

Part I of the book is entitled “Technology, Business, and Basics of AI.” In “Technical Elements of Machine Learning for Intellectual Property Law” (Chapter 1), Anthony Man-Cho So helpfully provides basic knowledge on learning or self-correction patterns—a capability known as “machine learning” (“ML”)—with a view to

¹ Artificial Intelligence and Intellectual Property 1 (Jyh-An Lee, Reto M. Hilty, and Kung-Chung Liu, eds., 2021).

² *Id.*

“facilitate the legal discussions on IP issues.”³ This chapter is particularly useful to readers without an information technology background. For instance, the “overview of key concepts and constructions in ML”⁴ that Man-Cho So presents in his foundational chapter helps explain “the ways human efforts are involved in the development of ML solutions.”⁵ Man-Cho So also explains the scenario of a data-centered economy created by AI-operated software, which counterpoints traditional computer programs that are not capable of ML.

The next two chapters of Part I discuss the fundamentals of AI and how it functions, offering examples of its application in specific areas that demonstrate the importance and versatility of the role AI software can play in improving the human experience in many fields. One of the areas most affected by AI is healthcare. In that field, AI has positively influenced patient experience both in preventative and recovery measures. As Ivan Khoo Yi and Andrew Fang Hao Sen discuss in “The Rise and Application of AI in Healthcare” (Chapter 2), AI applications often make use of large amounts of data, obtained over many years. These large data sets (known as “Big Data”) have helped physicians carry out complex tasks, such as diagnoses, calculations of risk probabilities, and even surgeries—feats that only a few years ago were inconceivable. Nevertheless, AI has been used in medicine cautiously, given that it faces short-, medium-, and long-term risks regarding drugs, treatment of patients, and other issues, such as risk of distribution shift, insensitivity to impact, black box decision-making, cybercrime risk, and lack of a fail-safe, raising voices of concern, as the authors explain.

Completing Part I by addressing the foundations underlying the social, business, and economic aspects of innovation and AI’s impacts on IP, Reto M. Hilty, Jörg Hoffmann, and Stefan Scheuerer examine the “Intellectual Property Justification for AI” (Chapter 3).

Part II, entitled “Artificial Intelligence and Patent Law,” analyzes AI and its creations from the perspective of patent rights, starting with Raphael Zingg’s “Foundational Patents in AI” (Chapter 4), addressing, with tables summarizing statistics, the increasing AI patenting trend and triadic AI patents by country as well as patent eligibility requirements. One of the issues mentioned refers to patent trolls, the colloquial term for “patent enforcement entities that do not invest in bringing technology to the market via the acquired invention. Rather, they amass patent portfolios for the sole purpose of generating revenue by prosecuting infringement.”⁶

³ *Id.* at 11.

⁴ *Id.*

⁵ *Id.*

⁶ *Id.* at 78.

This is followed by Ichiro Nakayama's "Patentability and PHOSITA in the AI Era—A Japanese Perspective" (Chapter 5). Nakayama discusses how AI impacts society and distinguishes "AI-assisted inventions"⁷ from "inventions of AI technologies."⁸ Nakayama further points out that AI would create inventions more easily, thereby raising the level of the inventive step. Part II highlights the problems of maintaining an outdated patent protection system, which could reduce the number of patent applications by disincentivizing human inventors due to AI's facility to rapidly generate content, while the effects of blockchain and AI throughout the patent prosecution are studied in "Digitalized Invention, Decentralized Patent System: The Impact of Blockchain and AI on the Patent Prosecution" (Chapter 6), in which Feroz Ali addresses patent office transformation, machine prosecution, and decentralization issues.

Part III, entitled "Artificial Intelligence and Copyright Law," focuses on copyright law and when it should apply to creative works generated by or with AI. Andres Guadamuz, author of "Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in AI Generated Works" (Chapter 7), touches upon his line of research on the legal ownership system of AI-generated works and on creativity and originality standards in the UK and in the EU. The chapter discusses, for instance, that in the UK a "computer-generated work"⁹—one that is created by AI—is deemed to lack creative input, and thus would fall outside of the creativity and originality requirements for granting such a work copyright protection.

The subject matter of AI and copyrights, with their multiple relationships—but also boundaries—vis-à-vis data-in-mind, receives further attention in three other cohesive chapters (Chapters 8–10, respectively): "Computer-generated Works under the CDPA 1988," by Jyh-An Lee; "Copyright Exceptions Reform and AI Data Analysis in China: A Modest Proposal," by Tianxiang He; and "A Taxonomy of Training Data: Disentangling the Mismatched Rights, Remedies, and Rationales for Restricting Machine Learning," by Benjamin Sobel.

Part IV, entitled "AI and IP Administration," captures the impact of AI on IP management. It begins with "Patent Examination of AI-related Inventions: An Overview of China" (Chapter 11), by Jianchen Liu and Ming Liu, which summarizes the experience in China of the major changes affecting the patent-granting process due to the transformations made by AI in the invention workflow. In "AI and Trademark Assessment" (Chapter 12), Anke Moerland

⁷ *Id.* at 99.

⁸ *Id.*

⁹ *Id.* at 157.

and Conrado Freitas discuss the possibility of using AI for trademark assessment—mainly, the limits faced by AI technologies when a more subjective analysis of signs is required. From their tests, Moerland and Freitas conclude that the current AI technologies used by governmental IP offices perform only simple tasks, such as searching prior registered signs, image recognition and comparison, and classification of goods and services, but they perform no examinations that involve complex and subjective examination.

An analogous issue—using AI for trademark infringement assessment (in particular, the limits faced by AI technologies when a more subjective analysis is required)—is addressed by Daniel Seng under a catchily titled section (Chapter 13)—“Detecting and Prosecuting IP Infringement with AI: Can the AI Genie Repulse the Forty Counterfeit Thieves of Alibaba?”—which tackles the use of AI to detect violations. As emphasized by the author, the methods that electronically search, capture, and report undue use of proprietary trademarks in online markets as well as the automated takedown systems of counterfeit products play an important role in policing platforms that advertise and provide e-commerce where such merchandise, listings, or content can be found. However, AI technologies still have many limitations, such as a lack of transparency, system errors, and ML operation inconsistencies. Essentially, Seng’s chapter discussing the use of automated enforcement systems, both as exposed to favorable improvements and to functional difficulties, is appreciative of trademark owner needs in a context of growing online piracy.

In Part V, entitled “Legal Aspects of Software,” Hao-Yun Chen and Peter R. Slowinski, respective authors of Chapters 14 (“Copyright Protection for Software 2.0? Rethinking the Justification of Software Protection under Copyright Law”) and 15 (“Rethinking Software Protection”), raise the need to rethink how copyright law applies to software, introducing particularities concerning software 2.0, ML, and evolutionary algorithms. These two chapters highlight the unique challenges of protecting AI applications through IPRs and suggest that trade secrets may offer better protection in some cases than copyright law.

Part VI, entitled “Protection of and Access to Data,” offers observations first by Kung-Chung Liu and Shufeng Zheng. In “Protection of and Access to Relevant Data—General Issues” (Chapter 16), Liu and Zheng provide an overview of the challenges faced by companies to access data and to protect it. In “Protection of and Access to Data under European Law” (Chapter 17), Matthias Leistner focuses on the same topic under European Union (“EU”) law, addressing three aspects: the infrastructural framework of access to data, the protection of databases, and the existing *sui generis* protection regime for databases under the EU’s Directive

96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases.

Part VII, entitled “The Bigger Picture,” sheds light on the role that AI plays in the fourth industrial revolution, given that AI can detect patterns in data in a way that is not yet possible for humans—with no need for rest, completing tasks in record time and frequently with an outstanding level of quality. These and other aspects are discussed in “Competition and IP Policy for AI—Socio-economic Aspects of Innovation,” by Anselm Kamperman Sanders (Chapter 18). Against this background and considering how AI will reshape innovation, prosecution, and enforcement of IP rights, it is fair to question whether AI could be recognized as a separate, autonomous legal entity, as is done by Eliza Mik in the final chapter of the book—“AI as a Legal Person?” (Chapter 19)—in which she analyzes focal points concerning demystification and autonomy of computer creativity, while studying the issue of “granting legal personhood to an AI in the context of IP law.”¹⁰

Although many rapidly evolving advancements have been made in AI technologies following the book’s publication in 2021, such as ChatGPT, its subject matter remains current because the concepts discussed are still relevant. While recognizing that AI is developing and will continue to develop, each chapter opens questions to paradigms of the future, not intended (as referenced above) to settle responses to legal regimes of specific jurisdictions but rather to pose general questions, exchange experiences, and provide insights—for instance, on why “competition authorities will have to provide the necessary regulatory oversight”¹¹ of platform providers in respect of data sets used to train neural networks (AI) and on how AI enables new models of creativity and innovation, such as “co-created IP contents.”¹²

These topics are addressed along with a large series of complexities of the potential or actual changes produced by automation progress within the framework of IP. Ease of consultation is provided at the end of the book by a detailed A–Z index that scores high in relevant searchability of this collective work’s expressive content.

¹⁰ *Id.* at 438.

¹¹ *Id.* at 418.

¹² *Id.* at 417.