

NEW OWNERSHIP HIERARCHY FOR AI CREATIONS

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ABSTRACT

Over the recent years, technology in general has developed at an incredible pace. Artificial Intelligence, commonly abbreviated to AI, being one of the most exciting and innovative disciplines. While AI has clearly improved our daily lives in multiple ways, it also poses serious risks to humanity. One of the most significant challenges of the law system is to adapt itself to the unprecedented rate of technology and AI development. Generative AI in the last year has accomplished incredible breakthroughs and achievements. Consequently, a new era of legal questions regarding AI creations has emerged. AI can be divided into four ages since its beginning in 1950. During the first and second ages, AI reached remarkable capacities but remained a tool for humans with limited capabilities as it required human input for any action. Exclusive ownership for the individuals or corporation that produced the generative AI was relevant till the beginning of the third age. In the third age, in which

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AI has already taken its first steps, it can create artwork as paintings and drawings, musical compositions, books, and even computer codes with no human contribution at all. A new ownership legal framework must be created for generative AI creations in the third age based on sui generis rights. Such sui generis rights founded on existing doctrines would provide the creator of AI weakened rights to artistic work created by AI. Such rights will guarantee to receive just compensation for important financial and labor investment while simultaneously acknowledging the role AI plays in the creative process. This new legal system will last until the fourth age of AI is reached, in which Artificial Intelligence will become an Artificial Consciousness (AC). In the last age of AI, the situation will be apocalyptic, and AI will be granted exclusive traditional intellectual property rights for its own creations.

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I. INTRODUCTION

In the last twenty years, Artificial Intelligence has already impacted how humans live. Over the coming decades, Artificial Intelligence (“AI”)¹ will be present in all areas of our lives and society. AI will impact the economy and employment,² wars,³ healthcare,⁴ mapping and

¹ For the purposes of this article, AI systems, AI models, AI techniques, AI programs, software, computers and machines are all used interchangeably to describe and refer to Artificial Intelligence in general.

² Jason Furman & Robert Seamans, *AI and the Economy*, 19 INNOVATION POL’Y & ECON. 161, 185 (2019).

³ Ruben Stewart & Georgias Hinds, *Algorithms of war: The use of artificial intelligence in decision making in armed conflict*, ICRC (Oct. 24, 2023), <https://blogs.icrc.org/law-and-policy/2023/10/24/algorithms-of-war-use-of-artificial-intelligence-decision-making-armed-conflict/> [https://perma.cc/M4ET-ZFPD].

⁴ Scott J. Shackelford & Rachel Dockery, *Governing AI*, 30 CORNELL J. L. & PUB. POL’Y 279, 281 (2020); PETER LEE, CAREY GOLDBERG & ISAAC KOHANE, THE AI REVOLUTION IN MEDICINE (2023).

navigation,⁵ and interaction between humans. AI is already a major disruptor on many life aspects such as energy,⁶ education,⁷ environmental sustainability,⁸ finance,⁹ and beyond. According to Google's CEO, Sundar Pichai, AI is the most important invention humanity has ever created, even more important than fire and electricity.¹⁰ AI will, on the one hand, improve the quality of our lives, but it will on the other raise ethical and societal concerns: with new technologies, legal and regulatory issues constantly emerge.¹¹ AI is being developed much faster than expected, and consequently, several countries are taking steps to try to regulate it. In May 2023, G7 members convened to set up discussions regarding generative AI.¹² EU legislators

⁵ Robert Barnes, *The Social Ethics of Autonomous Vehicle Routing and Navigation: Spatial Recognition Technologies, Environment Mapping Algorithms, and Mobility Simulation Tools*, 14 CONTEMP. READINGS L. & SOC. JUST. 154, 165 (2022).

⁶ Amy L. Stein, *Artificial Intelligence and Climate Change*, 37 YALE J. ON REG. 890, 900 (2020).

⁷ Angeliki Sideraki & Athanasios Drigas, *Artificial Intelligence (AI) in Autism*, 26 TECHNIUM SOC. SCI. J. 262, 262 (2021).

⁸ Mudit Jain & Apurva Mishra, *AI Ensures Environmental Sustainability*, 5 INT'L J.L. MGMT. & HUMANS. 521, 523 (2022).

⁹ Kate Scott, *AI and Risk for Financial Institutions*, CLIFFORD CHANCE (Mar. 2019), <https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2019/03/ai-and-risk-for-financial-institutions.pdf> [<https://perma.cc/DH3Z-M53A>].

¹⁰ Catherine Clifford, *Google CEO: A.I. is More Important than Fire or Electricity*, CNBC (Feb. 1, 2018), <https://www.cnbc.com/2018/02/01/google-ceo-sundar-pichai-ai-is-more-important-than-fire-electricity.html> [<https://perma.cc/BY3H-FGTH>].

¹¹ See Adam Satariano, *ChatGPT is Banned in Italy Over Privacy Concern*, N.Y. TIMES (Mar. 31, 2023), <https://www.nytimes.com/2023/03/31/technology/chatgpt-italy-ban.html> [<https://perma.cc/F4W5-ZN8Q>]; Shreeja Athota, *Legal Issues in the Use of Blockchain in Finance Transactions*, 3 INT'L J.L. MGMT. & HUMANS. 878, 878 (2020) (Italy's privacy regulator has banned ChatGPT for data protection and privacy violations).

¹² Kantaro Komiyama, *G7 Should Adopt 'Risk-Based' AI Regulation, Ministers Say*, REUTERS (May 1, 2023) <https://www.reuters.com>

recommended nations around the world convene a summit to discuss the control and regulation of new AI development¹³ and to finalize the last details of the AI act before plenary adoption. The European Union is the first region to try to establish AI rules to regulate its use.¹⁴ Likewise, the United States, which usually does not rush into the regulation of new technology, as a means to assure its leadership in those fields, has started to examine new potential regulations regarding AI tools such as ChatGPT.¹⁵

AI will most likely threaten human beings, employment, and civilization itself.¹⁶ People regard AI as the future of humanity, while most people are afraid of machines outperforming humans in every field, believing it will harm humanity more than make it better.¹⁷ In some

/markets/europe/g7-should-adopt-risk-based-ai-regulation-ministers-say-2023-04-30/ [https://web.archive.org/web/20230925125610/https://www.reuters.com/markets/europe/g7-should-adopt-risk-based-ai-regulation-ministers-say-2023-04-30/].

¹³ Martin Coulter, *EU Lawmakers Call for Summit to Control 'Very Powerful' AI*, REUTERS (Apr. 17, 2023), <https://www.reuters.com/technology/eu-lawmakers-call-political-attention-powerful-ai-2023-04-17/>.

¹⁴ Ryan Browne, *EU Lawmakers Pass Landmark Artificial Intelligence Regulation*, CNBC (June 14, 2023), <https://www.cnbc.com/2023/06/14/eu-lawmakers-pass-landmark-artificial-intelligence-regulation.html> [https://perma.cc/TCX4-44PL].

¹⁵ Ryan Tracy, *Biden Administration Weighs Possible Rules for AI Tools Like ChatGPT*, WSJ (Apr. 11, 2023), <https://www.wsj.com/articles/biden-administration-weighs-possible-rules-for-ai-tools-like-chatgpt-46f8257b>.

¹⁶ Furman & Seamans, *supra* note 2; Julia Horowitz, *14 Million Jobs Worldwide Will Vanish in the Next 5 Years, New Economic Report Finds*, CNN (Apr. 30, 2023), <https://edition.cnn.com/2023/04/30/business/automation-jobs-world-economic-forum/index> [https://perma.cc/6CLE-HTUN].

¹⁷ Kif Leswing, *Only 9% of Americans Think A.I. Development Will Do More Good than Harm*, CNBC (Feb. 15, 2023), <https://www.cnbc.com/2023/02/15/only-9percent-of-americans-think-ai-development-will-do-more-good-than-harm-.html> [https://perma.cc/8HE5-U3FC].

specific fields, such as healthcare, employees already feel uncomfortable with the use of AI.¹⁸ People are afraid that AI will outsmart humans, and ultimately replace them in the workplace¹⁹. A common argument is the example of language-automated software, which continues to be developed and threatens many professions. Some experts think it will threaten human relationships,²⁰ the countries' national security,²¹ and foreign policy.²² Entrepreneurs, scientists, philanthropists, and futurists such as Elon Musk, Stephen Hawking, Bill Gates, and Ray Kurzweil have publicly shown their fear that science fiction will no longer

¹⁸ Jen Christensen, *Most Americans Are Uncomfortable with Artificial Intelligence in Health Care, Survey Finds*, CNN (Feb. 22, 2023), <https://www.cnn.com/2023/02/22/health/artificial-intelligence-health-care/index.html> [<https://perma.cc/FDU2-5NXC>].

¹⁹ In February 2023, the first AI lawyer robot was supposed to advise a client in court. See Christina Coulter, *DoNotPay Claims First AI-Powered 'Robot Lawyer' to Debut in Court Hearing Next Month*, YAHOO (Jan. 24, 2023), <https://www.yahoo.com/entertainment/donotpay-claims-first-ai-powered-215735306.html> (stating that in February 2023, the first AI lawyer robot was supposed to advise a client in court); *Chinese tech company appoints an AI-powered virtual humanoid robot as CEO - claiming it will ensure 'a fair and efficient workplace for all employees'*, DAILY MAIL (Sep. 8, 2022), <https://www.dailymail.co.uk/sciencetech/article-11193113/Chinese-tech-company-appoints-AI-powered-virtual-humanoid-ROBOT-CEO.html> [<https://perma.cc/GH32-95CX>] (stating that in September 2022, the first AI humanoid was named as the CEO of NetDragon Websoft, a big Chinese enterprise. Fiona Jackson).

²⁰ Nicholas A. Christakis, *How AI Will Rewire Us*, THE ATLANTIC (Apr. 2019), <https://www.theatlantic.com/magazine/archive/2019/04/robots-human-relationships/583204/> [<https://perma.cc/T66D-6YG3>].

²¹ See *The Final Report*, NATIONAL SECURITY COMMISSION ON ARTIFICIAL INTELLIGENCE (2021), <https://reports.nscai.gov/final-report/#:~:text=The%20Final%20Report&text=The%20technologies%20will%20be%20the,to%20pursue%20their%20strategic%20ambitions> [<https://perma.cc/PQN5-VF9S>].

²² Elena Tilovska-Kechedji, Milica Kolakovic Bojovic & Dragana Cvorovic, *Artificial Intelligence Influencing Foreign Policy and Security*, 2018 J.E.-EUR. CRIM. L. 7, 11 (2018).

be fiction, in other words, humans will lose control over AI,²³ and robots will turn against their creators to pose an existential threat to human civilization.²⁴ A terrible apocalyptic scenario imagined by Isaac Asimov in his book collection “I, Robot” which later became a successful film starring Will Smith, is unlikely to become real, at least not in the next years. However, let us imagine what could happen.

Imagine it is 2040, and the world as you know it has changed; everyone owns a service robot to help perform routine tasks at home and work, assisting with mundane cooking and cleaning chores. The elderly have a service robot to take care of them, and nannies and babysitters have been replaced with robots to take care of children when parents are absent.²⁵ Moreover, dating humanoid robots has become a common norm, and the law allows robots and humans to get married.²⁶ The humanoid robots look physically like human beings and can display human emotions and facial expressions.²⁷ Driverless cars have

²³ Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J. L. & TECH. 889, 890 (2018).

²⁴ Hawking told BBC News: “The development of full artificial intelligence could spell the end of the human race.” Rory Cellan-Jones, *Stephen Hawking Warns Artificial Intelligence Could End Mankind*, BBC NEWS (Dec. 2, 2014), <https://www.bbc.com/news/technology-30290540> [<https://perma.cc/PX8G-J4Y7>]; Ryan Browne, *Elon Musk Warns A.I. Could Create an ‘Immortal Dictator from Which We Can Never Escape’*, CNBC (Apr. 6, 2018), <https://www.cnbc.com/2018/04/06/elon-musk-warns-ai-could-create-immortal-dictator-in-documentary.html> [<https://perma.cc/PH6J-XNZK>].

²⁵ Valarie K. Blak Qe, *Regulating Care Robots*, 92 TEMP. L. REV. 551, 553, 557 (2020).

²⁶ See Margaret Ryznar, *Robot Love*, 49 SETON HALL L. REV. 353, 355, 367 (2019).

²⁷ Emma Roth, *A Humanoid Robot Makes Eerily Lifelike Facial Expressions*, THE VERGE (Dec. 6, 2021), <https://www.theverge.com/2021/12/5/22819328/humanoid-robot-eerily-lifelike-facial-expressions> [<https://perma.cc/6TAT-BCN2>].

reached the last level of autonomy, and companies like Tesla and Waymo have successfully created their latest fully automated car. Human taxi drivers are extinct, and most people own a driverless vehicle. States, governments, and armies have developed killer robots and other autonomous weapons.²⁸ Humans no longer guide their drones, and they have complete control and decision-making capacity. Each household has a three-dimensional printer.²⁹ Most professions known today have vanished, and new positions have risen. AI are the new artists, and their creations are sold for millions of dollars.³⁰ Museums are full of AI-generated paintings.³¹ Each week, the most listened to music on YouTube and Spotify are songs composed by AI. On the top of the best seller lists, you will find novels written by AI. Novels were later adapted into cinema. Through AI applications developed by big high-tech companies, people

²⁸ James Dawes, *Killer Robots are the Future of Warfare and the 'Inevitable Next Step' in Russia's Long Bloody Invasion of Ukraine*, FORTUNE (Feb. 21, 2023), <https://fortune.com/2023/02/21/killer-robots-a-i-future-warfare-russia-ukraine-invasion/> [<https://perma.cc/D6BZ-AUBF>].

²⁹ Filemon Schoffer, *Down the Hype Cycle: A 3D Printer in Every Home?*, TECH CRUNCH (Jan. 26, 2016), <https://techcrunch.com/2016/01/26/whats-next-for-3d-printing-hype-cycle/> [<https://perma.cc/J97R-KK4G>].

³⁰ See Gabe Cohn, *AI Art at Christie's Sells for \$432,500*, N.Y. TIMES (Oct. 25, 2018), <https://www.nytimes.com/2018/10/25/arts/design/ai-art-sold-christies.html> [<https://perma.cc/E98S-3P7L>] (stating that in 2018, a portrait known as the portrait of Edmond Bellamy generated by AI has been sold by Christie's for \$432,500); James Vincent, *Christie's Sells its First AI Portrait for \$432,500, Beating Estimates of \$10,000*, THE VERGE (Oct. 25, 2018), <https://www.theverge.com/2018/10/25/18023266/ai-art-portrait-christies-obvious-sold> [<https://perma.cc/RFU2-JAB5>]; see also Carys Craig & Ian Kerr, *The Death of the AI Author*, 52 OTTAWA L. REV. 31, 39 (2020).

³¹ Doloresz Katanich, *The World's First AI Art Gallery Opens in Amsterdam*, EURONEWS (Mar. 21, 2023), <https://www.euronews.com/culture/2023/03/21/the-worlds-first-ai-art-gallery-opens-in-amsterdam> [<https://perma.cc/UMH9-7Z36>].

can easily ask AI to create almost everything. Several class actions and lawsuits against high-tech corporations are filed every day and open an area of new legal questions.

Nonetheless, one does not need to wait until 2040 to be a witness to the first lawsuits regarding AI creations. In November 2022 and January 2023, two class actions and another lawsuit were filed for the first time against big AI companies, some of them being huge actors in the field of AI.³² The first class action was filed by a group of programmers against three known companies: OpenAI, GitHub Inc., and Microsoft Corp., accusing them of infringing the legal intellectual property rights of programmers with the development of “Copilot.” Copilot is an AI that generates new codes based on a huge dataset of algorithm codes.³³ The second class action was filed by a group of artists against three other companies: Stability AI Ltd., Mid-Journey, and Devian Art, accusing them of violating the copyrights of millions of artists with their generative applications that are trained on the enormous database in which thousands of artistic works are used as trained data.³⁴ The third lawsuit was filed in January 2023 by Getty Images against Stability-AI for training its AI with 12 million images belonging to Getty Images.³⁵ More

³² Kyle Wiggers, *The Current Legal Cases Against Generative AI are Just the Beginning*, TECH CRUNCH (Jan. 27, 2023), <https://techcrunch.com/2023/01/27/the-current-legal-cases-against-generative-ai-are-just-the-beginning/> [https://perma.cc/AZ3A-2BVL].

³³ Cade Metz, *Lawsuit Takes Aim at the Way A.I. is Built*, N.Y. TIMES (Nov. 23, 2022), <https://www.nytimes.com/2022/11/23/technology/copilot-microsoft-ai-lawsuit.html> [https://perma.cc/G74V-922W].

³⁴ Blake Brittain, *Lawsuits Accuse AI Content Creators of Misusing Copyrighted Work*, REUTERS (Jan. 17, 2023), www.reuters.com/legal/transactional/lawsuits-accuse-ai-content-creators-misusing-copyrighted-work-2023-01-17/.

³⁵ Jennifer Corn, *Getty Images Suing the Makers of Popular AI Art Tool for Allegedly Stealing Photos*, CNN (Jan. 18, 2023), <https://www.cnn.com/2023/01/17/tech/getty-images-stability-ai-lawsuit/index.html#:~:text=check%20back%20later.->

recently, in July 2023, Google's chatbot, Bard, was being sued for using personal information and other protected data to train its algorithm.³⁶ It is only the beginning of new legal issues. With time, the number of lawsuits and claims against AI ownership, infringement of rights, invasion of privacy, and accountability will continue to increase.

Despite astounding progress and achievements, AI still fails to equal human intellectual capacities. Human civilization is still far from such a scenario because AI has still not reached the capacity to think by itself, understand its own acts, have emotions, or show empathy. However, in many fields, it has or will certainly reach a level of automation that could make us contemplate the adequate ownership regimes relevant to these machines and their future creations. Technology development will lead us to an AI human-like being. Developing new analytics methods, such as natural language processing, permits AI systems to create content.³⁷ Nowadays, OpenAI's ChatGPT application, a chatbot based on the GPT program, is the language model that brought AI to the masses. Before ChatGPT, most people lacked knowledge about AI and certainly did not use it. ChatGPT, Google's Bard application, and other tools such as Lensa, Mid-journey, and DALL-E can already produce content that is difficult to distinguish from content produced by humans. All one needs to do is to describe what is wanted and ask the system

,Getty%20Images%20suing%20the%20makers%20of%20popular,tool%20for%20allegedly%20stealing%20photos&text=Getty%20Images%20announced%20a%20lawsuit,tech%20company%20committed%20copyright%20infringement [https://perma.cc/48DY-696F].

³⁶ Blake Brittain, *Google Hit with Class-Action Lawsuit Over AI Data Scraping*, REUTERS (July 12, 2023), <https://www.reuters.com/legal/litigation/google-hit-with-class-action-lawsuit-over-ai-data-scraping-2023-07-11/>.

³⁷ AVIV H. GAON, *THE FUTURE OF COPYRIGHT IN THE AGE OF ARTIFICIAL INTELLIGENCE* 1–2 (2021).

to produce it. Today, AI is already capable of writing articles,³⁸ composing songs,³⁹ and even “painting.”⁴⁰

These impressive breakthroughs are making us wonder what kind of AI will be available in 2040 and what kind of concept it could create. Who should be the owner of those creations? Should AI be the owner of artistic creation and be granted copyright? Should AI be listed as an inventor in a patent application? Are AI artworks responding to the originality and creativity requirement in intellectual property laws all over the world? What if an AI creates or develops a dangerous creation by itself? Should the response to these questions be relevant to the level of automation, autonomy, and intellect of machines? When is the limit crossed? When should it be said, stop? AI has reached a high enough level of autonomy to be the owner of its own creations. If the conclusion is that AI should become the owner of its creations, should AI be legally able to sue for infringement of its IP rights, and could humans sue AI for infringement of their IP rights? Does answering ‘yes’ to some of these aforementioned questions imply that a specific legal personality for AI should be created?

All the different potential scenarios described could very well happen in real-time. There are some legal, ethical,

³⁸ Artificial Intelligence (AI), *A Robot Wrote this Entire Article. Are You Scared Yet, Human?*, THE GUARDIAN (Sep. 8, 2020), <https://www.theguardian.com/commentisfree/2020/sep/08/robot-wrote-this-article-gpt-3> [<https://perma.cc/Q6MJ-7JSU>].

³⁹ Matt McFarland, *Google’s Computers are Creating Songs. Making Music May Never be the Same*, WASH. POST (June 6, 2016), <https://www.washingtonpost.com/news/innovations/wp/2016/06/06/google-computers-are-creating-songs-making-music-may-never-be-the-same/> [<https://perma.cc/KC2E-PF4R>]; Emily Ostertag Whittle, *Rage Against the Machine: Copyright Protection and Artificial Intelligence in Music*, 20 VA. SPORTS & ENT. L.J. 56, 63 (2021).

⁴⁰ Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era: The Human-like Authors are Already Here: A New Model*, MICH. ST. L. REV. 659, 662 (2017).

and societal issues that governments and companies will have to ask themselves. In 2017, the European Parliament's Committee on Legal Affairs published a report in which they recommended constructing a new legal status of electronic persons for robots to make them responsible for any damage caused.⁴¹ Is it really the solution? Is it right to remove responsibility and accountability from the big technology companies? Is it right to grant AI human rights? The fact that in 2017, Saudi Arabia gave Sophia, a social robot, citizenship⁴² could be seen as the first step on this path. How do we regulate this incredible entity called AI? To answer this question, there is a critical need to evaluate what level of autonomy is required, if any, to attribute ownership to AI. Answering these questions will help us to resolve issues regarding AI's potential future accountability. If a certain level of autonomy in which AI should be the owner of its own creations is defined, perhaps AI should also be considered as a separate legal entity or at least create an alternative legal personality.

The first chapter will retrace the history of AI and its development from its early beginning, to today by categorizing AI into four ages. It will define AI and its different techniques and advancements. This chapter will provide an overview of the differences between weak and strong AI and attempt to link it to the theory of singularity and Moore's law. This chapter aims to understand how the convergence of powerful computers, big data, and exceptional funding have made possible the developments of AI in the last decade. This chapter aims to evaluate what

⁴¹ Report with Recommendations to the Commission on Civil Law Rules on Robotics, EUR. PARL. DOC. A8-0005 (2017).

⁴² Cleve R. Wootson Jr., *Saudi Arabia, Which Denies Woman Equal Rights, Makes a Robot a Citizen*, WASH. POST (Oct. 29, 2017), <https://www.washingtonpost.com/news/innovations/wp/2017/10/29/saudi-arabia-which-denies-women-equal-rights-makes-a-robot-a-citizen/> [https://perma.cc/Q4ZA-XB68].

level of automation and autonomy is required to define generative AI as the owner of its creations. *The second chapter* will define ownership based on the labor theory of John Locke, the most celebrated philosopher in IP rights. Who labored on making machine-producing creations? Based on Locke's theory of property, this chapter will endeavor to link the theory to Intellectual Property ("IP") rights and IP protection purposes. It will also establish a parallel between God and humans in Locke's theory, a relation known as the workmanship model, and the potential relation between humans and AI today.

The third chapter will address an overview of AI's creation capacity. The chapter will explain the difference between AI creations and AI-assisted creations and support the arguments with examples. This chapter will seek to explain why, in the first and second ages of AI history, companies should be the exclusive owners of AI creations by providing an overview of the current legal framework and how scholars, courts, copyright, and patent offices throughout the world are dealing with new legal issues emerging with generative AI. *The fourth chapter* addresses the futuristic potential ownership regimes to be considered while AI has already entered the third and is getting closer to the fourth age. The regime proposed to apply in the third age will be called "The Medium-Size Ownership" regime. A regime will undeniably weaken humans' proprietary rights regarding new AI creations but will not provide full IP rights to AI. This chapter will also provide an overview of the ownership regime to be defined at the last level of AI autonomy. At the fourth age of AI, when the development of AI will finally permit the AI community to reach the goal of AI by creating an artificial consciousness ("AC"), AI will finally be the only owner of its own creations. This regime will be called "The Apocalyptic Ownership" Regime.

II. THE EVOLUTION OF ARTIFICIAL INTELLIGENCE

A. *Pre-First Age*

For a long time, for most populations, the field of AI was only a subject of science fiction in which machines interacted with humans. It all started with the hostile robots of Isaac Asimov's "I, Robot" book collection. It continued with R2-D2 in *Star Wars*, WOPR in *Wargame*, HAL 9000 in *2001: Space Odyssey*, as well as Skynet in the film *Terminator*. However, nobody could have imagined that AI would become a contemporary field that would impact real life. When George Orwell wrote his book "1984," it was far-fetched even to imagine humanity living in a time when meat is printed⁴³ and robots are granted citizenship.⁴⁴ The convergence of scientific breakthroughs, advances in algorithm data, funding, and affordable computer power have made possible the development of AI systems that most of us consider as miraculous.⁴⁵ AI is everywhere, and already societies can no longer function without AI anymore.⁴⁶

The basics of AI were designed at the beginning of the 1940s when Alan Turing, an English mathematician and

⁴³ Zoe Williams, *3D-Printed Steak, Anyone? I Taste Test this 'Gamechanging' Meat Mimic*, THE GUARDIAN (Nov. 16, 2021), <https://www.theguardian.com/food/2021/nov/16/3d-printed-steak-taste-test-meat-mimic> [<https://perma.cc/DMK9-ZEKK>].

⁴⁴ Wootson, *supra* note 42; see also Elizabeth Rocha, *Sophia: Exploring the Ways AI May Change Intellectual Property Protections*, 28 DEPAUL J. ART TECH. & INTELL. PROP. L. 126, 128 (2018).

⁴⁵ Haochen Sun, *Redesigning Copyright Protection in the Era of Artificial Intelligence*, 107 IOWA L. REV. 1213, 1249 (2022); Han-Wei Liu & Ching-Fu Lin, *Artificial Intelligence and Global Trade Governance: A Pluralist Agenda*, 61 HARV. INT'L L.J. 301, 312 (2020).

⁴⁶ Shivani, *A Life Without AI is Something Beyond Imagination in this 21st Century*, INDUSTRY WIRED (Dec. 30, 2021), <https://industrywired.com/a-life-without-ai-is-something-beyond-imagination-in-this-21st-century/> [<https://perma.cc/2DUP-CR6X>].

a pioneer of computer science, invented a system to hack the cryptogram machine named “Enigma,” used by the Nazis to send encrypted messages.⁴⁷ Turing found a way to decipher Enigma by developing a machine referred to as “The Bombe”⁴⁸ that permitted the allies during the Second World War to discover the strategic information of the Nazis.⁴⁹ Turing made a substantial contribution to the development of AI. Historically, at each development since Turing broke the Enigma, AI may be categorized into four different ages⁵⁰ to permit us to understand where humanity is, in terms of AI development, and where it is heading in the future. For the purpose of this article, the categorization of AI into ages will be slightly different from what has been proposed in the past.

In the late 1940s, when the first computers were being developed, there was real excitement in the public sphere about the potential of these great achievements. Norbert Wiener, an MIT mathematics professor, is one example of a scientist who contributed to the excitement of the public when he authored a best seller named “Cybernetics.”⁵¹ In *Cybernetics*, the author made several comparisons between the brain and digital computers; he tried to argue how to apply control and communication to machines and discussed the potential application of feedback

⁴⁷ Zoe Niesel, *Machine Learning and the New Civil Procedure*, 73 SMU L. REV. 493, 518 (2020).

⁴⁸ Jack Copeland, *Alan Turing: The Codebreaker who Saved ‘Millions of Lives’*, BBC (June 19, 2012), <https://www.bbc.com/news/technology-18419691> [<https://perma.cc/7TY6-WW4C>].

⁴⁹ LAURENT ALEXANDRE, *LA GUERRE DES INTELLIGENCE, INTELLIGENCE ARTIFICIELLE VERSUS INTELLIGENCE HUMAINE* 4 (Jean Claude Lattes, ed., 2017).

⁵⁰ *Id.* at 26–27.

⁵¹ NORBERT WIENER, *CYBERNETICS: OR CONTROL AND COMMUNICATION IN THE ANIMAL AND THE MACHINE* (1948); STUART RUSSELL & PETER NORVIG, *ARTIFICIAL INTELLIGENCE: A MODERN APPROACH* 15 (3d ed. 2010).

to help a machine improve its learning by itself.⁵² In addition, press and radio talk shows also started to argue issues such as whether machines could think, and how?⁵³ People were clearly excited about the future and started to imagine a new world in which AI would improve humans' life in every field. This is the beginning of the first Age of AI.

B. The First Age: 1950 - 2010

In "Computing Machinery and Intelligence,"⁵⁴ published in 1950, Alan Turing described and introduced a novel way to test a machine's intelligence. Inspired by a game called "The Imitation Game,"⁵⁵ Turing proposed a test known today as the "Turing Test". It aims to verify the ability of a machine to show signs of human intelligence⁵⁶ and to answer the question, "Can machines think?"⁵⁷ The principle of the Turing Test is simple: there are three players: the man, the machine, and the third person who is the interrogator. The interrogator is responsible for interviewing and evaluating the written answers provided by the two other participants who are in two separate rooms.⁵⁸ The

⁵² *Id.*

⁵³ MICHAEL WOOLDRIDGE, A BRIEF HISTORY OF ARTIFICIAL INTELLIGENCE: WHAT IT IS, WHERE WE ARE, AND WHERE WE ARE GOING 23 (2021).

⁵⁴ Alan M. Turing, *Computing Machinery and Intelligence*, 59 MIND 433–60 (1950).

⁵⁵ *Id.* at 433 (explaining the role of the interrogator in the imitation game from which he was inspired to invent the Turing test. In the imitation game, there are also 3 players: The man, the woman, and the interrogator. The interrogator must ask several questions to the man and the woman (instead of the machine in the Turing test) and following the responses his role is to discern the man from the woman.)

⁵⁶ *Id.* at 433–60.

⁵⁷ *Id.* at 433, 441.

⁵⁸ F. E. Guerra-Pujol, *The Turing Test and the Legal Process*, 21 INFO. & COMM. TECH. L. 113, 114 (2012).

interrogator knows that one of the two participants is a machine but is unaware of which one.⁵⁹ The interrogator has a reasonable amount of time to discern the man from the machine. If he fails, then the machine passes the test.⁶⁰ The test has the purpose of measuring the machine's ability to provide answers that resembles those a human would provide.⁶¹ If a machine is found capable of fooling a human interrogator by pretending to be a human being, then the machine could be referred to as intelligent.⁶²

Eliza, a language processing tool interacting with humans, is a computer program created at MIT by computer scientist Joseph Weizenbaum in the 1960s.⁶³ Eliza is still perceived today as a significant milestone regarding the development of AI.⁶⁴ It is the first worldly known chatbot and a prime example of a program which was capable to simulate a conversation with a human. Eliza is most likely the first machine to fool the Turing test interrogator.⁶⁵ As stated by Weizenbaum, “*Some subjects have been very hard to convince that ELIZA . . . is not human.*”⁶⁶ It is interesting to perceive how, despite its capacity to convince that it was

⁵⁹ Turing, *supra* note 54, at 440–41.

⁶⁰ *Id.*

⁶¹ STUART RUSSELL, HUMAN COMPATIBLE: ARTIFICIAL INTELLIGENCE AND THE PROBLEM OF CONTROL 40–41 (2019).

⁶² Simon Chesterman, *Artificial Intelligence and the Limits of Legal Personality*, 69 INT’L & COMP. L.Q. 819, 820 (2020).

⁶³ Joseph Weizenbaum, *ELIZA: A Computer Program for the Study of Natural Language Communication Between Man and Machine*, 9 COMM. OF THE ACM 36, 36 (1966).

⁶⁴ Ax Ramshore, *ELIZA: The Chatbot Who Revolutionised Human-Machine Interaction [An Introduction]*, MEDIUM (Jan. 18, 2021), <https://medium.com/nerd-for-tech/eliza-the-chatbot-who-revolutionised-human-machine-interaction-an-introduction-582a7581f91c> [<https://perma.cc/E99W-EQZB>].

⁶⁵ Eric Allen Engle, *An Introduction to Artificial Intelligence and Legal Reasoning: Using xTalk to Model the Alien Tort Claims Act and Torture Victim Protection Act*, 11 RICH. J.L. & TECH. 53, 63 (2004).

⁶⁶ Weizenbaum, *supra* note 63, at 42.

human, Eliza was only simulating a psychotherapist discussion with its patient while it clearly had no understanding of the dialogue itself.⁶⁷ The question of AI understanding, or just simulating dialogues or context, is critical to evaluate the level of autonomy of AI. As will be demonstrated later, if AI is unable to understand the dialogue, it is difficult to attribute to AI human characteristics and capabilities. AI is not human, and it does not matter how much it mimics human behavior; it will not be a human.

At the time, AI was a subject of discussion, and scientists tried to understand and develop AI even though the field was not established as an independent and academic one. AI was not even named “AI,” but it was already an important subject of debate, intriguing households. In 1956, before the establishment of AI as a discipline, one of the first ever AI reasoning programs, called “Logic Theorist,” was created by Allen Newell, Herbert A. Simon, and Cliff Shaw.⁶⁸ Finally, the emergence of AI as an independent academic field, can be found in the *Dartmouth Summer Research Project on Artificial Intelligence*,⁶⁹ that took place in the U.S. in 1956 where leading scientists and researchers met to discuss Artificial Intelligence.⁷⁰ During this conference, the term “*Artificial Intelligence*” was coined by the scientist John McCarthy, one of the organizers of the conference.⁷¹ However, some scientists and experts in the

⁶⁷ WOOLDRIDGE, *supra* note 53, at 27.

⁶⁸ PAMELA MCCORDUCK, *MACHINES WHO THINK: A PERSONAL INQUIRY INTO THE HISTORY AND PROSPECTS OF ARTIFICIAL INTELLIGENCE* 123–24 (2d ed. 2004).

⁶⁹ John McCarthy et al., *A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence*, 1955, *AI MAG* 27, no. 4 12–14 (2006).

⁷⁰ RUSSELL & NORVIG, *supra* note 51, at 17.

⁷¹ *Id.*

field, including a portion of the Dartmouth conference attendees, disagreed with that name.⁷²

This workshop is considered to be the one that gave birth to the new field called AI.⁷³ Until this event, AI had only been a figment of the human imagination. Marvin Minsky and John McCarthy hosted the workshop with the purpose of reuniting eminent scientists from multiple domains to form and establish a new academic discipline.⁷⁴ This workshop is recognized as “*the official beginning of serious work in artificial intelligence.*”⁷⁵ At that time, scientists believed that the creation of machines that would equal human intelligence was imminent.⁷⁶ Scientists were confident about the future of AI and made wrong predictions. An example of this overconfidence and overoptimism came from Herbert Simon in 1957, when he stated that “*there are now in the world machines that think, that learn and that create.*”⁷⁷ Moreover, he later predicted that “*within 10 years a computer would be a chess champion,*”⁷⁸ a prediction that became real 40 years later.⁷⁹

⁷² MCCORDUCK, *supra* note 68, at 115 (stating that Arthur Samuel said, “The word artificial makes you think there’s something kind of phony about this” and “Neither Newell nor Simon liked the phrase and called their own work complex information processing for years thereafter.”)

⁷³ RUSSELL & NORVIG, *supra* note 51, at 17.

⁷⁴ Michael Haenlein & Andrea Kaplan, *A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence*, 61 CAL. MAN. REV. 5, 7 (2019).

⁷⁵ NILS J. NILSSON, THE QUEST FOR ARTIFICIAL INTELLIGENCE 80 (2010).

⁷⁶ See McCarthy et al., *supra* note 69, at 2 (stating in the proposal that, “We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.”).

⁷⁷ RUSSELL & NORVIG, *supra* note 51, at 20.

⁷⁸ *Id.* at 21.

⁷⁹ Murray Campbell et al., *Deep Blue*, 134 ARTIFICIAL INTELL. 57, 59 (2002).

The period that followed the Dartmouth summer workshop until 1974 is called the *golden years of AI*, in which AI flourished.⁸⁰ An era of spectacular and rapid progress where nothing seemed impossible. AI researchers believed that it would only take a few years till the absolute goal of AI would be reached, the dream of every AI researcher: to develop an AI that will possess cognitive and emotional intelligence.⁸¹ *Life Magazine* interviewed Marvin Minsky in 1970 about the future of AI. During the interview, Minsky predicted that an intelligent machine with human capabilities could be attained within three to eight years.⁸² Undoubtedly a wrong prediction that shows how much scientists were over-optimistic about AI. During this period, as its name indicates, there were great achievements. SHAKEY is one of them.⁸³ SHAKEY was one of the greatest achievements of the golden age of AI and the first real autonomous and mobile robot,⁸⁴ but it was clearly limited by its performance. Reasoning and problem-solving were the approaches used, but they were insufficient. It demonstrated to the AI community how far humanity was from reaching the “absolute goal” of AI and the complexity of the human brain. AI reaching the human intellect seemed to be once more elusive.

In the early 1970s, AI researchers promised the world inventions that they were unable to deliver. Wrong and naive reckless predictions and over-ambitious promises of the AI community added to several disappointments, and failure in the field led to a reduction of funding as well as a lower interest in the field of AI. In 1973, the U.S. Congress, scientists, experts, and journalists started to criticize the high spending on AI research. The good times seemed to be over.

⁸⁰ WOOLDRIDGE, *supra* note 53, at 35.

⁸¹ See Haenlein & Kaplan, *supra* note 74, at 7.

⁸² *Id.*

⁸³ MCCORDUCK, *supra* note 68, at 272.

⁸⁴ WOOLDRIDGE, *supra* note 53, at 49.

Following these critics, the United Kingdom's Science Research Council commissioned a report known as the "Lighthill Report" that concluded: "*In no part of the field have the discoveries made so far produced the major impact that was then promised.*"⁸⁵ Following this report, the British government took the decision to end almost every funding for AI research across the U.K.⁸⁶ In the United States, the military funding agency, DARPA, the principal funder of AI for many years, was also disappointed with the failure of AI to answer to the huge expectation and ended funding.⁸⁷ The era that followed the Golden Age is known in the world of computer science research as "AI Winter."⁸⁸

By the late 1980s, a new AI paradigm, known as behavioral AI, was established in the field. The specific strategy used in the development of the new AI was known as the *subsumption architecture*.⁸⁹ It appears to have had an important effect on all the strategies used at the time and has impacted AI development up until today.⁹⁰ This innovative approach had a fundamental methodology. It necessitates the experts to understand which specific component behaviors were needed, then starting to build the robot by gradually adding behaviors and organizing them in a hierarchy to determine the order of behaviors.⁹¹ This is the methodology and strategy that allowed to create the robot

⁸⁵ Michael James Lighthill, *Artificial Intelligence: A general survey, AI: A Paper Symposium*, Science Research Council of Great Britain (1973).

⁸⁶ WOOLDRIDGE, *supra* note 53, at 61.

⁸⁷ Radikha Wijendra, *AI Winter | Past, Present and Future*, MEDIUM (Aug. 11, 2021), https://medium.com/@radhika_wijendra/ai-winter-955874b1f18c [<https://perma.cc/E6ZB-FDUS>].

⁸⁸ WOOLDRIDGE, *supra* note 53, at 61; NILSSON, *supra* note 75, at 345.

⁸⁹ Rodney Brooks, *A Robust Layered Control System for a Mobile Robot*. J. ROBOT. AUTOM. 2, 16 (1986).

⁹⁰ WOOLDRIDGE, *supra* note 53, at 88.

⁹¹ *Id.* at 89, 90.

vacuum cleaner, for example.⁹² However, in the end, AI performance was some distance away from the expectation. Behavioral AI, as impressive as it was for the period, was still insufficient to reach human intelligence.

Since the beginning of AI as an independent discipline, chess has always been perceived as the ultimate proof of the superiority of human intelligence. For scientists, it was obvious that machines would never be able to defeat humans in this strategic game.⁹³ Nevertheless, in the 1990's, IBM made the most incredible breakthrough. On May 11, 1997, the IBM supercomputer, "Deep Blue," beat the chess world champion Gary Kasparov in a pair of 6-game chess.⁹⁴ An accomplishment that even Kasparov himself could certainly not believe and was furious about, while at first, he accused IBM of cheating.⁹⁵ When he was asked if he accused IBM of cheating, he retorted: "*I have no idea what's happening behind the curtain. Maybe it was an outstanding accomplishment by the computer. But I don't think this machine is unbeatable.*"⁹⁶ This event has been described by the essayist and philosopher George Steiner as the most important event in the 20th century.⁹⁷ Nonetheless,

⁹² Rodney Brooks, an Australian roboticist, is the one who coined the term "subsumption architecture" and was one of the founders of the vacuum cleaner company "iRobot."

⁹³ YUVAL NOAH HARARI, *HOMO DEUS: A BRIEF HISTORY OF TOMORROW* 344 (2016).

⁹⁴ David Goodman & Raymond Keene, *MAN VERSUS MACHINE: KASPAROV VERSUS DEEP BLUE* 8 (1997); Ryan Abbott, *Everything is Obvious*, 66 *UCLA L. REV.* 2, 23 (2019).

⁹⁵ Bruce Weber, *IBM Chess Machine Beats Humanity's Champ*, *N.Y. TIMES* (May 12, 1997), <https://archive.nytimes.com/www.nytimes.com/library/cyber/week/051297weber.html> [<https://perma.cc/NN7W-8L5C>].

⁹⁶ *Id.*

⁹⁷ See George Steiner, quoted in Juliette Cerf, *Le philosophe et Critique George Steiner est Mort*, *TELERAMA* (Feb. 4, 2020), <https://www.telarama.fr/idees/george-steiner-l-europe-est-en-train-de-sacrifier-ses-jeunes,75871.php> [<https://perma.cc/8ZN9-WDKJ>]

it is paramount to note that Deep Blue had a limited impact, as it was designed to only play chess.⁹⁸

The first age of AI includes the period between 1950 and 2010, characterized by the emergence of basic AI techniques such as behavioral AI.⁹⁹ Such techniques have permitted AI to perform very simple tasks based on straightforward algorithms. As it will be explained later, 2010 is the year of apparition of a new technique called deep learning, in which the AI system is capable of learning on his own from mistakes, and thus does not require human intervention.¹⁰⁰ It can be concluded that until the apparition of deep learning, the first age was characterized by full human control and intervention in AI decision-making. During this period, a computer beat the world chess champion for the first time,¹⁰¹ and AI researchers created a new academic discipline, coining it as AI.¹⁰² The field experienced its ups and downs, but ultimately, this age had shown AI experts the limits of AI.¹⁰³

C. The Second Age: 2010 - 2017

Despite the progress made during the first age of AI, computer programs still had not acquired the most sophisticated characteristics of the human brain. The most

(Translation: “The most important event in the 20th century was not the war or the financial crash, but the evening when the chess champion Kasparov lost a match against a little metal box . . . Will that little box compose music one day?”).

⁹⁸ Abbott, *supra* note 94, at 23.

⁹⁹ *E.g.*, Brooks, *supra* note 89.

¹⁰⁰ *What Is Deep Learning?*, IBM, <https://www.ibm.com/topics/deep-learning> [<https://perma.cc/TZ6Y-3SG7>] (last visited Apr. 26, 2024).

¹⁰¹ Goodman & Keene, *supra* note 94.

¹⁰² RUSSELL & NORVIG, *supra* note 51, at 17.

¹⁰³ Ben Lutkevich, *AI Winter*, TECHTARGET (Aug. 2022), <https://www.techtargget.com/searchenterpriseai/definition/AI-winter> [<https://perma.cc/R78F-GZT6>].

powerful computers on earth could not be compared to human intelligence. A computer beating the human champion in a strategic game of chess was impressive, but AI experts needed more. To make a new step in the direction of human intelligence, scientists required a new innovative method. This new step manifested and is referred to as *deep learning*,¹⁰⁴ a sub-field of machine learning technique. The principal purpose of machine learning is that based on trained data, the machine is capable of learning and performing a desired output without being programmed to do so.¹⁰⁵ It is important to understand how much machine learning is dependent on data as AI without a deep dataset would not be able to do anything.¹⁰⁶ Image recognition and natural language processing are examples of programs fed with tons of data in which machine learning is used.¹⁰⁷

Deep learning is a type of machine learning in which experts attempt to copy the mechanism of the human brain by using neural networks composed of layers to allow the machine to learn from data.¹⁰⁸ Deep learning is the third wave in the history of what is called *neural networks* research, and eventually the most successful.¹⁰⁹ The first neural network computer was built in 1950 by two Harvard students, one of them was Marvin Minsky¹¹⁰, later known as

¹⁰⁴ Maryam M. Najafabadi et al., *Deep Learning Applications and Challenges in Big Data Analytics*, 2 J. BIG DATA 1, 7 (2015).

¹⁰⁵ See TOM M. MITCHELL, *MACHINE LEARNING* (McGraw Hill, 1997).

¹⁰⁶ WOOLDRIDGE, *supra* note 53, at 111–12.

¹⁰⁷ Prateek Joshi, *A Must-Read NLP Tutorial on Neural Machine Translation — The Technique Powering Google Translate*, MEDIUM (Jan. 31, 2019), <https://medium.com/analytics-vidhya/a-must-read-nlp-tutorial-on-neural-machine-translation-the-technique-powering-google-translate-c5c8d97d7587> [<https://perma.cc/8ZJN-W5V9>].

¹⁰⁸ Corina Maria Vasile, et al., *A Review of Deep Learning in Medical Practice*, 21 RES. & SCI. TODAY 67, 69 (2021).

¹⁰⁹ WOOLDRIDGE, *supra* note 53, at 119.

¹¹⁰ RUSSELL & NORVIG, *supra* note 51, at 16.

one of the founding fathers of AI.¹¹¹ The second wave of neural network research took place in the 1980s. The development of the deep learning technique is the invention that propelled the AI field to what is known today. The purpose is to imitate the human brain by learning from tons of data, some capabilities that belong to humans, such as analyzing, learning, and making their own decisions¹¹². The principal purpose of machine learning is that, based on trained data, the machine is capable of learning and performing a desired output without being programmed to do so.¹¹³

In 2011, IBM's AI for smarter business, Watson, defeated the best human "Jeopardy!" players around the world.¹¹⁴ Watson is not only a game player but is also capable of making disease diagnoses more quickly and with a higher percentage of success than doctors.¹¹⁵ At the time, the New York Times wrote that machines would not be able to play "Go", a Chinese strategic game much more complex than chess, and cited Dr. Piet Hut who said "It may be a hundred years before a computer beats humans at Go — maybe even longer."¹¹⁶ In 2014, Google acquired

¹¹¹ Tim W. Dornis, *Artificial Intelligence and Innovation: The End of Patent Law as We Know It*, 23 YALE J.L. & TECH. 97, 105 (2020)

¹¹² Najafabadi et al., *supra* note 104, at 4.

¹¹³ See David Foster, GENERATIVE DEEP LEARNING (O'Reilly Media, Inc., 2019).

¹¹⁴ Ryan Abbott, *I think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 BOSTON COLL. L. REV. 1079, 1089 (2016); Adam Gabbatt, *IBM Computer Watson Wins Jeopardy Clash*, GUARDIAN (Feb. 17, 2011), <https://www.theguardian.com/technology/2011/feb/17/ibm-computer-watson-wins-jeopardy> [<https://perma.cc/K9VW-B6WS>].

¹¹⁵ Ian Steadman, *IBM's Watson is better at diagnosing cancer than human doctors*, WIRED (Feb. 11, 2013), <https://www.wired.co.uk/article/ibm-watson-medical-doctor> [<https://perma.cc/8XNX-8Y2K>].

¹¹⁶ George Johnson, *To Test a Powerful Computer, Play an Ancient Game*, N.Y. Times (July 29, 1997), <https://www.nytimes.com/1997>

DeepMind for \$650 million, a company nobody had heard about until the acquisition.¹¹⁷ In 2015, AI developed by DeepMind learned to play 49 Atari video games, alone.¹¹⁸ Words said by DeepMind vice president of engineering, Dr. Hassabis, illustrate the exceptional development of AI: “The only information we gave the system was the raw pixels on the screen and the idea that it had to get a high score. And everything else it had to figure out by itself”¹¹⁹.

If people thought that after such a breakthrough, AI would experience a new winter, they were wrong. In 2016, AlphaGo,¹²⁰ an AI developed by the same company, DeepMind, made an impressive achievement when it defeated the Korean grand master Lee Sedol at the game called “Go”.¹²¹ One year later, in 2017, AlphaGo beat the Go world champion Ke Jie,¹²² who later defined Google’s AI as

/07/29/science/to-test-a-powerful-computer-play-an-ancient-game.html [https://web.archive.org/web/20240206214400/https://www.nytimes.com/1997/07/29/science/to-test-a-powerful-computer-play-an-ancient-game.html]

¹¹⁷ Samuel Gibbs, *Google Buys UK Artificial Intelligence Startup DeepMind for £400m*, GUARDIAN (Jan. 27, 2014), <https://www.theguardian.com/technology/2014/jan/27/google-acquires-uk-artificial-intelligence-startup-deepmind> [https://perma.cc/6LVT-G355].

¹¹⁸ Volodymyr Mnih, et al., *Human-level control through deep reinforcement learning*, 518 NATURE 529, 529 (2015).

¹¹⁹ Rebecca Morelle, *Google machine learns to master video games*, BBC NEWS (Feb. 25, 2015), <http://bbc.com/news/science-environment-31623427> [https://perma.cc/S7PR-8WQU].

¹²⁰ *AlphaGo*, GOOGLE DEEPMIND, <https://www.deepmind.com/research/highlighted-research/alphago> [https://perma.cc/6BZ2-6YET] (last visited Apr. 24, 2024).

¹²¹ Steven Borowiec, *AlphaGo seals 4-1 victory over Go grandmaster Lee Sedol*, GUARDIAN (Mar. 15, 2016), <https://www.theguardian.com/technology/2016/mar/15/googles-alphago-seals-4-1-victory-over-grandmaster-lee-sedol> [https://perma.cc/WKB3-EHTH].

¹²² Paolo Bory, *Deep new: The Shifting Narratives of Artificial Intelligence from Deep Blue to AlphaGo*, INT’L J. RES. N. MEDIA TECH., 25, 1, 17 (2019).

a god.¹²³ The incredible point about this win is that AlphaGo learned to play the game absolutely on its own, by playing against itself and not by analyzing games played by humans against each other.¹²⁴ It is important to understand that the victory of AlphaGo was much more impressive due to the difference between chess and Go.¹²⁵ While chess is based on mathematical logics, Go is based on intuitive logic, which requires abstract thinking and is more difficult due to its search space.¹²⁶ The technique used in most of these cases is called reinforcement learning, that permits the program to act and learn to improve its actions following feedback (called “reward”) it receives.¹²⁷ For example, if AlphaGo loses a hand of Go, it gets negative feedback and the next time AlphaGo plays, it takes any negative feedback into account to improve its game.¹²⁸

AI does not just play games; it interferes in every field, aspect, and sphere of human life because of machine learning. In two decades, AI has become hyped, intriguing most of us, and has the potential to revolutionize many industries. AI is already used in a wide range of areas and disciplines, including driverless cars,¹²⁹ automatic

¹²³ *Id.* (internal citation omitted) (“To me, AlphaGo is a god, a being that can defeat anyone or anything. What he sees is the whole universe, while what we see is just a pond in front of us.”)

¹²⁴ WOOLDRIDGE, *supra* note 53 at 128; ALEXANDRE, *supra* note 49, at 43.

¹²⁵ Abbott, *supra* note 94, at 24.

¹²⁶ David Silver et al., *Mastering the Game of Go with Deep Neural Networks and Tree Search*, 529 NATURE 484, 484–89 (2016); ALEXANDRE, *supra* note 49, at 49.

¹²⁷ See Richard S. Sutton & Andrew G. Barto, REINFORCEMENT LEARNING: AN INTRODUCTION 7, 57-59 (2d ed. 2018); WOOLDRIDGE, *supra* note 53, at 113.

¹²⁸ WOOLDRIDGE, *supra* note 53, at 113.

¹²⁹ Alexa St. John, *Tesla’s not even in the top 10 of self-driving firms, according to experts who ranked all of the leading companies working on automation*, BUSINESS INSIDER, (Apr. 27, 2023, 8:39 AM),

translation,¹³⁰ drones, and autonomous weapons.¹³¹ AI is even used to develop machines collaborating with humans to improve the human capacity to diagnose cancer and other diseases. For example, BioMind is an AI that excels in analyzing MRI images and establishing cancer diagnoses.¹³² In a competition between radiologists and BioMind, AI made a good diagnostic in 95% of the cases while several radiologists made a good diagnostic in 65% of the cases.¹³³ In 2018, in a contest in the legal field, a language automated software beat law professors by analyzing non-disclosure agreements two hundred times faster.¹³⁴ Furthermore, text and image recognition are used by cities in camera surveillance to prevent criminal crime, and New York City is one of these cities.¹³⁵ People routinely use software smart

<https://www.businessinsider.com/tesla-self-driving-not-in-top-ranked-autonomy-guidehouse-research-2023-3> [<https://perma.cc/8CTE-99B9>].

¹³⁰ Joshi, *supra* note 107.

¹³¹ Liran Ant, *The Proliferation of Autonomous Weapons Systems: Effects on International Relations*, INSS (Oct. 2019), <https://www.inss.org.il/publication/the-proliferation-of-autonomous-weapons-systems-effects-on-international-relations/> [<https://perma.cc/SK9X-QLLZ>].

¹³² David Ayalon, *BioMind, Artificial Intelligence that Defeats Doctors in Tumor Diagnosis*, MEDIUM (Aug. 8, 2018), <https://medium.com/future-today/biomind-artificial-intelligence-that-defeats-doctors-in-tumour-diagnosis-5f8ec97298b2> [<https://perma.cc/G3C9-E2CQ>].

¹³³ *Id.*

¹³⁴ RUSSELL, *supra* note 61, at 119.

¹³⁵ John R. Quain, *Crime-Predicting A.I. Isn't Science Fiction. It's About To Roll Out in India*, DIGITAL TRENDS (Apr. 11, 2018), https://www.digitaltrends.com/cool-tech/could-ai-based-surveillance-predict-crime-before-it-happens/?utm_source=twitter&utm_medium=social&utm_campaign=divr.it [<https://perma.cc/5ZPB-5TNX>].

agents such as Siri,¹³⁶ Cortana,¹³⁷ or Alexa.¹³⁸ More recently, in 2019, IBM developed the first computer to successfully debate against champion debaters.¹³⁹ All of these are improving human lives in every field, and it can certainly be said, that AI currently improves security, health, and human productivity.

The second age began with the emergence of new AI techniques and models of machine learning, such as deep learning and reinforcement learning.¹⁴⁰ Even though experts thought that such age would end around 2030, this article supposes that this period ended approximately in 2017, when it was witnessed that AI had begun to become increasingly independent. More transparency is needed today as a repeated question is asked by all the players in the AI field, not knowing most of the time why AI acts the way it does.¹⁴¹ The second age has been marked by the potential of machines to learn alone and to generate content with minimal human intervention, based on trained data and experiences. The kind of AI that marked this period was an AI that was still controlled by humans but was autonomous enough to be in the intermediary phase before the third age.

¹³⁶ Siri, APPLE, INC., <https://apple.com/siri/> [<https://perma.cc/PPS8-9D82>] (last visited Apr. 24, 2024).

¹³⁷ Cortana, MICROSOFT, <https://www.microsoft.com/en-us/cortana> [<https://perma.cc/ZV4X-GLEC>] (last visited Apr. 24, 2024).

¹³⁸ Heather Kelly, *Which Is the Best Digital Assistant: Siri, Cortana, Alexa or Google Now?*, CNN BUSINESS (July 28, 2015), <https://money.cnn.com/2015/07/28/technology/digital-assistant-interview/index.html> [<https://perma.cc/2PZX-ZA73>].

¹³⁹ Cade Metz & Steve Lohr, *IBM Unveils System That 'Debates' With Humans*, N.Y. TIMES ONLINE (June 18, 2018) <https://www.nytimes.com/2018/06/18/technology/ibm-debater-artificial-intelligence.html> [<https://perma.cc/3AD4-5GG8>].

¹⁴⁰ ALEXANDRE, *supra* note 49, at 26.

¹⁴¹ Ron Schmelzer, *Towards a More Transparent AI*, FORBES (May 23, 2020), <https://www.forbes.com/sites/cognitiveworld/2020/05/23/towards-a-more-transparent-ai/?sh=3ac625153d93> [<https://perma.cc/RW2M-K45P>].

It is important to note that for some AI experts, the second age of AI will end only around 2030, but the human-AI division has already started as AI is less and less dependent on its creator. Even if most of today's AI development is still in the scope of the second age, the division between the humans and AI has opened the door to the third age.

D. *Towards the Third and Fourth Ages: Humanity AI*

As of today, there is no international standard definition recognized by the international AI community. The reason for this is that there is no consensus regarding such a definition among AI experts.¹⁴² Some would define AI as a machine that can reproduce or automate tasks that require human cognition or human intelligence.¹⁴³ For the founding father of the discipline, McCarthy, AI is “a machine that behaves in ways that would be called intelligent if a human were so behaving.”¹⁴⁴ He further defined AI as “the science and engineering of making intelligent machines, especially intelligent computer programs.”¹⁴⁵ For Nilsson, AI “is that activity devoted to making machines intelligent, and intelligence is the quality that enables an entity to function appropriately and with foresight in its environment.”¹⁴⁶ Most of the experts agree that AI is the simulation of human intelligence by machines especially computer systems just as it is defined by

¹⁴² John McCarthy, *What is Artificial Intelligence?*, STANFORD UNIV. (Nov. 12, 2007, 2 :05 AM), <http://jmc.stanford.edu/articles/whatisai/whatisai.pdf> [<https://perma.cc/E3SE-WXSU>].

¹⁴³ Harry Surden, *Artificial Intelligence and Law: An Overview*, 35 GA. ST. UNIV. L. REV. 1305, 1307 (2019).

¹⁴⁴ John McCarthy et al., *supra* note 69, at 11.

¹⁴⁵ McCarthy, *supra* note 142, at 2.

¹⁴⁶ NILSSON, *supra* note 75, at 13.

McKinsey and Company: “The practice of getting machines to mimic human intelligence to perform tasks.”¹⁴⁷

Software and technology have led to a completely different world. If you consider how AI developed between 1950 and 2005 and compare it to how AI has developed during the last decade, you may be left contemplating why and how technology development’s rapidity has been and still is exponential. The incredible technological developmental pace and the technology trajectory throughout the years could be explained by Moore’s law.¹⁴⁸ Moore’s law is a 1965 prediction made by the renowned scientist and Intel founder Gordon Moore regarding the evolution of computer power.¹⁴⁹ According to this law, the number of transistors will double every year, and thereby the power of computers will double simultaneously.¹⁵⁰ It implies that the rate of technology doubles every year as well.¹⁵¹ A decade later, in 1975, Moore added new data to his law and updated his prediction, increasing the rate to a doubling every two years, rather than every year.¹⁵²

This law permits people to have an idea concerning the technological capabilities that may be developed in the future, and it appears that soon, the world of the next generations will be dramatically different. This law also allows us to understand why the first age of AI lasted for 60

¹⁴⁷ McKinsey and Company, *What is Generative AI*, MCKINSEY & COMPANY (Jan. 19, 2023), <http://www.mckinsey.com/features-insights/mckinsey-explainers/what-is-generative-ai#/https://perma.cc/9FQC-633S>.

¹⁴⁸ David Rotman, *We’re not prepared for the end of Moore’s Law*, MIT TECH. REV. (2020).

¹⁴⁹ Gordon Moore, *Cramming More Components onto Integrated Circuits*, 86(1) PROCEEDINGS OF THE IEEE 82, 82 (1998).

¹⁵⁰ Rotman, *supra* note 148.

¹⁵¹ *Id.*

¹⁵² Gordon Moore, *Lithography and the Future of Moore’s Law*, 2439 PROC. SPIE 2, 8 (1995); Sean Hannon Williams, *AI Advice*, 48 FLA. ST. UNIV. L. REV. 761, 768 (2021).

years, while the second age only lasted for seven years. In 1938 the most powerful computer on earth had the ability to perform one operation every second.¹⁵³ In comparison, in 2017, the Chinese Taihulight was able to perform 93 quadrillion operations per second.¹⁵⁴ Experts predicted a slowdown from 2025 will be seen, and some experts are already claiming that Moore's Law has ended.¹⁵⁵ However, Moore himself predicted the end of his law by 1975.¹⁵⁶

The Turing Test provokes us to ask a crucial question. Is the machine understanding the dialogue (implying it has human characteristics such as consciousness, emotions, and self-awareness), or is the machine only simulating such understanding?¹⁵⁷ Although a machine could be able to simulate or imitate human behavior, computers, machines, AI are not able to feel pleasure, sadness, anger, and other feelings to show emotions linked to conscious creatures. At present, robots are incapable of showing emotions but can create the perception of showing them. This phenomenon is called *social valence*.¹⁵⁸ As Michael Scriven stated, “[t]hey do what humans do, but they cannot be what humans are”¹⁵⁹ John Searle, a philosopher historically known for his work in language philosophy, tried to explain why machines would never be able to think and understand for themselves,

¹⁵³ ALEXANDRE, *supra* note 49, at 35–36.

¹⁵⁴ *Id.* at 36

¹⁵⁵ Rotman, *supra* note 148.

¹⁵⁶ Gordon Moore, *Progress in Digital Integrated Electronics*. IEEE SSCS NEWSLETTER, 11, 13 (1975).

¹⁵⁷ WOOLDRIDGE, *supra* note 53, at 28; ALEXANDRE, *supra* note 49, at 33.

¹⁵⁸ Blake, *supra* note 25, at 558.

¹⁵⁹ Michael Scriven, *The Mechanical Concept of Mind*, 62:246 MIND 230, 231 (1953).

and to illustrate his assertion, he invented “The Chinese Room Argument.”¹⁶⁰

Imagine a room in which a person does not speak and does not understand Chinese. In the room, there is also a language phrasebook with symbols and instructions on how to manipulate the symbols in English. The room has only one window through which another person who speaks Chinese can provide notes in Chinese. The language rule book permits the person inside the room to select adequate responses and provides it back to the person outside the room. The fact the person inside the room succeeds in answering responses to the questions asked in Chinese by following instructions with the help of symbols does not mean that he speaks Chinese.¹⁶¹ It only means that he could simulate it with the help of instructions by correlating symbols with other symbols.¹⁶² In terms of machine learning, it could be deduced that he just succeeds to provide a desired output (to choose the right answers in Chinese) from an input (to respond to the questions) given based on trained data (the set of instructions). John Searle attempts to explain that if strong AI remains unattained with human emotional and cognitive capabilities, AI is only simulating human behavior without any understanding of its acts.¹⁶³ In fact, Searle perceives through the Chinese room a refutation of strong AI.¹⁶⁴

¹⁶⁰ See John R. Searle, *Minds, brains, and programs*, 3 *BEHAVIORAL & BRAIN SCI.* 417, 417–424. (1980); John R. Searle, “*The Emperor’s New Mind*”: *An Exchange*, N.Y. REV. (June 14, 1990), <https://www.nybooks.com.unh.idm.oclc.org/articles/1990/06/14/the-emperors-new-mind-an-exchange/> [<https://perma.cc/J2C5-2QPN>].

¹⁶¹ Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 *N.C. L. REV.* 1231, 1236 (1992).

¹⁶² *Id.*

¹⁶³ Alex Fernandes da Veiga Machado et al., *The Emergence of Artificial Consciousness and Its Importance to Reach The Technological Singularity*, X *KINESIS* 111, 118 (2018).

¹⁶⁴ RUSSELL & NORVIG, *supra* note 51, at 1031.

Searle was not the only one to criticize Turing and his intelligence test. Hector Levesque, a computer scientist at Toronto University, criticized the Turing test and proposed another test in the spirit of the Turing test to analyze the AI comprehension capacity. This test is called “The Winograd Schema Challenge”.¹⁶⁵ A Winograd schema is a “binary-choice question” with specific characteristics.¹⁶⁶ The next sentences are some examples provided by Levesque to illustrate the problem of comprehension of AI:

“Joan made sure to thank Susan for all the help she had given.”

“Joan made sure to thank Susan for all the help she had received.”¹⁶⁷

These are two very similar sentences distinguished by only one single word but with two distinct interpretations. The question to ask is, who has received help, and who has given help? Humans can answer these questions easily and instinctively, as it is for them commonsense reasoning. Human beings’ comprehension of such statements comes from their understanding of the context.¹⁶⁸ This capacity of comprehension of a sentence depending on the context in

¹⁶⁵ Hector J. Levesque, *On our Best behavior*, 212 A.I. 27, 30 (2014) [hereinafter *Best Behavior*]; Hector J. Levesque et al., *The Winograd Schema Challenge*, PROC. 13TH INT’L CONF. ON PRINCIPLES KNOWLEDGE REPRESENTATION AND REASONING 552, 558 (2012), <https://cdn.aaai.org/ocs/4492/4492-21843-1-PB.pdf> [<https://perma.cc/AQ8P-2YA9>] [hereinafter *Winograd Schema Challenge*].

¹⁶⁶ *Best Behavior*, *supra* note 165.

¹⁶⁷ *Winograd Schema Challenge*, *supra* note 165, at 554; Dean Alderucci, *The Automation of Legal Reasoning: Customized AI Techniques for the Patent Field*, 58 DUQ. L. REV. 50, 63 (2020).

¹⁶⁸ Alderucci, *supra* note 167.

which it is provided is a unique human capability and characteristic that AI has still not completely reached.¹⁶⁹

After understanding that AI only simulates human behavior, it is no less important to understand what differentiates AI today from a future AI that would reach some, if not all, of human aptitudes. AI can be divided into two categories: Weak AI and strong AI.¹⁷⁰ Searle himself coined those terms.¹⁷¹ It is understood that AI, as known today, is unable to “understand”; it can be said that it is still far away from human capacities. Weak AI, commonly referred to as narrow AI, is good at performing routine tasks.¹⁷² Most AI advancements developed to date, such as Google assistance, AlphaGo, Biomind, and Siri, can be categorized as weak AI. These AI systems are programs that demonstrate human capabilities without claiming to have these attributes. Autonomous programs acting as humans without any human soul or mind match Turing or Searle’s perceptions. However, a program that can “understand” in a similar way to how humans act and understand and simulate human behavior is called strong AI. Researchers and scientists from several fields are currently attempting to develop a more powerful AI, known as “Artificial Super Intelligence.”¹⁷³ This Artificial Super Intelligence will be the AI that will characterize the fourth age of AI.

¹⁶⁹ James Kelly, *Can chatGPT solve the Winograd Schema Challenge?*, MEDIUM (Feb. 24, 2023), <https://medium.com/@mrkellyjam/can-chatgpt-solve-the-winograd-schema-challenge-605bb6e3af79> [https://perma.cc/BDN8-DAMP].

¹⁷⁰ Eda Kavlakoglu, *AI vs. Machine Learning vs. Deep Learning vs. Neural Networks: What’s the Difference?*, IBM (May 27, 2020), <https://www.ibm.com/cloud/blog/ai-vs-machine-learning-vs-deeplearningvsneuralnetworks> [https://perma.cc/N54G-MYKX].

¹⁷¹ John R. Searle, *Minds, brains, and programs*, 3 *BEHAVIORAL & BRAIN SCI.* 417, 417 (1980).

¹⁷² Liu & Lin, *supra* note 45, at 311.

¹⁷³ See NICK BOSTROM, *SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES* 22 (2014) (defining “superintelligence” as “any intellect

Many proponents of transhumanism and futurists believe that a strong AI can develop self-awareness, consciousness, cognitive and emotional intelligence and reach the level of human intellect as they could think, desire, and understand as human beings do.¹⁷⁴ Strong AI would be the final accomplishment of the dream of a fully autonomous AI. Strong AI, as fascinating as it is, is still irrelevant. You could think about how an AI program, just as a child learns, would learn from its experiences and thus steadily improve and expand its skills.¹⁷⁵ Right now, strong AI only exists in science fiction books and movies. This categorization supports a better understanding of how human civilization is far from an uncontrolled AI equaling or surpassing human intellect. This so-called “Artificial General Intelligence” (AGI) or strong AI characterizes the fourth age of AI, or as this paper tends to call it, the apocalyptic age of AI. An era in which humankind could lose control over AI.¹⁷⁶

The fourth age would then be the period of strong AI or AGI, as it is also referred to by computer science experts. This kind of AI would probably be transformed from an “Artificial Intelligence” to an “Artificial Consciousness.”¹⁷⁷ According to Ryan Abbott, “AGI could even be set to the task of self-improvement, resulting in a continuously improving system that surpasses human intelligence. . . .”¹⁷⁸ The fourth Age would be marked by AI outperforming and

that greatly exceeds the cognitive performance of humans in virtually all domains of interests.”).

¹⁷⁴ Vincent Muller & Nick Bostrom, *Future progress in artificial intelligence: A survey of expert opinion*. in FUNDAMENTAL ISSUES OF ARTIFICIAL INTELLIGENCE 1–15 (Springer, 2016).

¹⁷⁵ Mohammad Mir et al., *Application of Artificial Intelligence in Medical Education: Current Scenario and Future Perspectives*, 11 J. OF ADVANCES IN MED. EDUC. & PROFESSIONALISM 133, 137 (2023).

¹⁷⁶ James Dawes, *Speculative Human Rights: Artificial Intelligence and the Future of the Human*, 42 HUM. RTS. Q. 573, 573 (2020).

¹⁷⁷ ALEXANDRE, *supra* note 49, at 27.

¹⁷⁸ Abbott, *supra* note 94, at 25.

surpassing humans in every field. It would be almost impossible to distinguish intellectually AGI from a human being.¹⁷⁹ Therefore, reaching such a period would be apocalyptic. This period, characterized by an AI equaling the human intellect in every aspect of intelligence, showing emotions, feeling intuitions, and self-awareness, including a capacity for understanding and reasoning, is, as aforementioned, still some distance away from now.

The rapid pace of development in AI during the last year, and particularly the publication of GPT-4 has led AI experts and technology leaders, including Elon Musk, Apple cofounder Steve Wozniak, Stability AI CEO Emad Mostaque, and university experts from Berkeley, Princeton, and others, to sign a letter in which they call to totally and immediately stop the research and development of AI for at least six months.¹⁸⁰ The letter has been issued by the Future of Life Institute and among other elements stipulate that “Powerful AI systems should be developed only once we are confident that their effects will be positive, and their risks will be manageable.”¹⁸¹ At the same time, Europol warned on March 27, 2023, about the potential misuse of AI and particularly of generative AI, for criminal purpose such as cybercrimes and other frauds.¹⁸² Even if humanity entered

¹⁷⁹ Liu & Lin, *supra* note 45, at 311.

¹⁸⁰ Andrew Griffin, *Halt development of new AI to protect humanity: Chilling call by Elon Musk and tech titans*, INDEPENDENT (Mar. 30, 2023), <https://www.independent.co.uk/tech/ai-artificial-intelligence-elon-musk-letter-b2309980.html> [<https://perma.cc/4JPJ-YAJD>]; Chris Pandolfo, *Elon Musk, Apple co-founder, other tech experts call for pause on 'giant AI experiments': 'Dangerous race'*, FOX NEWS (Mar. 29, 2023), <https://www.foxnews.com/politics/elon-musk-apple-co-founder-tech-experts-call-pause-giant-ai-experiments> [<https://perma.cc/EBE2-G968>] [hereinafter *Pandolfo*].

¹⁸¹ Pandolfo, *supra* note 180.

¹⁸² Foo Yun Chee, *Europol sounds alarm about criminal use of ChatGPT, sees grim outlook*, REUTERS (Mar. 27, 2023), <https://www.reuters.com/technology/europol-sounds-alarm-about->

the third age of AI a few years ago, while the division between the machine and humans started, this may be the official beginning of the third age. It is interesting to note the difference in time it took to pass from the first age to the second compared to the time it took to pass from the second to the third age.

The Third Age has already started and will be increasingly characterized by fully automated and autonomous machines without human capabilities. Homo sapiens has entered the third age, but it is only the beginning. Full autonomy and automation are the main characteristics of this age. The human contribution is slowly disappearing. An interesting development in the AI field that proves humanity is already in the third age of AI is that ChatGPT seems to be able to complete the Winograd challenge with an accuracy of about 73% when performing the task.¹⁸³ It proves AI is more and more capable of understanding contexts. Today, AI programs can produce content such as ChatGPT or DALL-E.¹⁸⁴ AI-Da was one of the first humanoid robot artist to “personally” exhibit its artwork in Oxford Ashmolean Museum.¹⁸⁵ A fake song featuring Weeknd and Drake vocals was created with the use of AI, which was removed from streaming platforms¹⁸⁶ showed the

criminal-use-chatgpt-sees-grim-outlook-2023-03-27/
[<https://perma.cc/F5PK-BF6H>].

¹⁸³ Kelly, *supra* note 169.

¹⁸⁴ Keith E. Sonderling & Bradford J. Kelley, *Filling the Void: Artificial Intelligence and Private Initiatives*, 24 N.C. J.L. & TECH. 153, 154 (2023).

¹⁸⁵ Gervase Rosser, *Dante and the Robot: An encounter at the Ashmolean*, OXFORD (Sept. 21, 2021), <https://www.ox.ac.uk/news/features/dante-and-robot-encounter-ashmolean>
[<https://perma.cc/9JV4-HC8R>].

¹⁸⁶ Laura Snapes, *AI Song Featuring Fake Drake and Weeknd Vocals Pulled from Streaming Services*, GUARDIAN (Apr. 18, 2023), <https://www.theguardian.com/music/2023/apr/18/ai-song-featuring-fake-drake-and-weeknd-vocals-pulled-from-streaming-services#:~:text=A%20song%20featuring%20AI%2Dgenerated,content>

capacity which could be reached in what is called “deep fake.”¹⁸⁷ AI and robotization are revolutionizing health with powered healthcare, such as in the last Apple Watch, which has an electrocardiogram application.¹⁸⁸ AI tools based on deep learning are capable to accurately detect skin cancers.¹⁸⁹ For the first time, babies have been conceived in an IVF laboratory by a robot.¹⁹⁰ Service robots using AI are also being developed by companies such as Hanson Robotics and Miso Robotics. Hanson Robotics has developed a humanoid called Sophia, that can communicate with humans¹⁹¹ while Miso Robotics has developed a kitchen assistant.¹⁹² Intuition Robotics is developing “empathic robots” that are intended to keep company to its users.¹⁹³

“created with generative AI” [https://perma.cc/3ZQJ-G57T].

¹⁸⁷ Ian Sample, *What Are Deepfakes – and How Can you Spot Them?*, GUARDIAN, (Jan. 13, 2020), <https://www.theguardian.com/technology/2020/jan/13/what-are-deepfakes-and-how-can-you-spot-them> [https://perma.cc/8W9W-G34B].

¹⁸⁸ Sanjay Gupta, *Dr. Sanjay Gupta tests the Apple Watch’s new ECG heart monitor*, CNN (Dec. 8, 2018), <https://edition.cnn.com/2018/12/06/health/apple-watch-ecg-app-review/index.html> [https://perma.cc/ZLZ7-RH3S].

¹⁸⁹ Andre Esteva et al., *Dermatologist-Level Classification of Skin Cancer with Deep Neural Networks*, 542 NATURE 115, 115 (2017).

¹⁹⁰ Antonio Regalado, *The First Babies Conceived with a Sperm-Injecting Robot Have Been Born*, MIT TECH. REV. (Apr. 25, 2023), <https://www.technologyreview.com/2023/04/25/1071933/first-babies-conceived-sperm-injecting-robot-ivf-automation-icsi-overture/> [https://perma.cc/2CTT-DBRR].

¹⁹¹ Catherine Jewell, *Bringing AI to Life*, WIPO MAG (Sept. 2018), https://www.wipo.int/wipo_magazine/en/2018/05/article_0003.html [https://perma.cc/2WL4-ZYJM].

¹⁹² Kate Rogers, *Chipotle is testing a robot that makes tortilla chips — and its name is ‘Chippy’*, CNBC (Mar. 16, 2022), <https://www.cnbc.com/2022/03/16/chipotle-tests-robot-kitchen-assistant-named-chippy-to-make-tortilla-chips.html> [https://perma.cc/YAE6-M5A4].

¹⁹³ Sagi Cohen, *Israeli-made Robot Providing Elderly Assistance Is Launched*, HAARETZ (Mar. 20, 2022), <https://www.haaretz.com/israel->

Such service robots could also be widespread in hospitals and are already used in nursing homes in France and Japan.¹⁹⁴ AI is still simulating human behavior, but it has reached a capacity of autonomy that has never been witnessed before. Human contribution and intervention are sometimes still part of the AI process as the human species has entered the third age but without being entirely inside that period.

Such machines will naturally be able to create without human contribution as society in its entirety is witness to the first of this kind. The third age is an intermediary period between the second age and the fourth age in which humans may lose control over AI. It is still the beginning of the third age, but the period in which all machines will be autonomous, and it will arrive sooner than expected. According to Demis Hassibas, Google Deepmind's CEO, human-level AI will be reached in a few years from now and states, "I don't see any reason why that progress is going to slow down. I think it may even accelerate."¹⁹⁵ It will be the era of fully automated driverless cars, AI capable of replacing humans in a range of professions, such as general doctors, and generative AI capable of creating and inventing without any human contribution. Who could imagine robots would one day expose their artwork in international museums?¹⁹⁶ This type of AI could probably beat every clinician. However, this type of AI, despite its level of autonomy, is still far from the

news/tech-news/2022-03-20/ty-article/.premium/Israeli-made-robot-providing-elderly-assistance-is-launched/00000180-5bda-dee0-afd6-7bdfbd300000 [https://perma.cc/G7SG-QH9H].

¹⁹⁴ Blake, *supra* note 25, at 552, 553.

¹⁹⁵ Anders Hangstrom, *Google DeepMind CEO says human-level AI will be here in 'a few years'*, FOX BUSINESS (May 4, 2023), <https://www.foxbusiness.com/technology/demis-hassabis-google-deepmind-ceo-says-human-level-ai-years> [https://perma.cc/LS85-RGMK].

¹⁹⁶ Rosser, *supra* note 185.

human intellect in terms of emotions and consciousness. The new multimodal AI, Imagebind,¹⁹⁷ presented recently by Meta’s CEO, Mark Zuckerberg, can create new content from a video or an audio recording. It was called the AI model “multimodal” due to its ability to combine six types of data representing the six human senses.¹⁹⁸ Such an AI system will propel humanity deeper into the third age of AI and become closer to apocalyptic AI.

In the 2000s, AI began to make deep and important breakthroughs. In 2004, research conducted by MIT professor Frank Levy and Harvard professor Richard Murnane wrote that it was difficult to imagine automated trucks driven by an algorithm.¹⁹⁹ Today, companies such as Motional and Waymo have developed the necessary technology to achieve this dream and are launching pilots.²⁰⁰ Fully autonomous cars have not yet been released on the road but the ability has been reached.²⁰¹ Accidents caused

¹⁹⁷ Akhash Badauria, *Unveiling IMAGEBIND: A Game-Changer for Multimodal Learning*, MEDIUM (May 16, 2023), <https://skybhad.medium.com/unveiling-imagebind-a-game-changer-for-multimodal-learning-dd060ae2112f> [<https://perma.cc/H7CB-VS55>].

¹⁹⁸ James Vincent, *Meta open-sources multisensory AI model that combines six types of data*, THE VERGE (May 9, 2023), <https://www.theverge.com/2023/5/9/23716558/meta-imagebind-open-source-multisensory-modal-ai-model-research> [<https://perma.cc/Y3S6-G82E>].

¹⁹⁹ HARARI, *supra* note 93, at 259–60.

²⁰⁰ St. John, *supra* note 129; Aarian Marshall, *Waymo Will Bring Autonomous Taxis to Los Angeles—Its Biggest Challenge Yet*, WIRED (Mar. 1, 2024) <https://www.wired.com/story/waymo-los-angeles-robotaxi-autonomous-car-approval/> [<https://perma.cc/5VUB-7VXX>]; Jennifer Corn, *Uber Launching Self-Driving Cars in Las Vegas*, CNN, (Dec. 7, 2022), <https://edition.cnn.com/2022/12/07/tech/uber-motional-self-driving-vegas/index.html> [<https://perma.cc/E69U-R29M>].

²⁰¹ Matt McFarland, *Self-driving cars were supposed to take over the road. What happened?*, CNN (Nov. 1, 2022), <https://edition.cnn.com/2022/11/01/business/self-driving-industry-ctrp/index.html> [<https://perma.cc/4L4H-9262>].

by driverless cars happen, and will still occur in the future,²⁰² but what has already been achieved in the field is enlightening. However, Motional announced in December 2022 the launch of autonomous taxi services in Las Vegas via the Uber network. For the moment, there will be human drivers on board who can supposedly intervene in the case of an unforeseen event.²⁰³ Undoubtedly, government regulators will not let driverless cars enter the road without any human control until it is proven to be safe.²⁰⁴ Although self-driving cars were only considered science fiction, experts predict by 2030 full automated driverless cars will be reached.²⁰⁵ Such innovation will drastically decrease the number of road accidents and will provide a safer and cheaper experience than human drivers as “computers interact and act more quickly, efficiently, and reliably than humans.”²⁰⁶ AI driverless cars are only one of the AI disruptive innovations of the 21st century and a pertinent example of third age autonomous AI which does not require any human intervention.

Despite the astounding breakthroughs and the development of AI as a discipline, machine and deep learning are only one step to the aspiration of strong AI or super intelligence. Presently, other ingredients are unknown to the AI community, but regarding AI development in the last decade, one can understand how relevant Moore’s law is. Even without being a computer scientist or an AI researcher, most can understand the answer to the question, “What will be the level of autonomy of AI in 5 years, 10

²⁰² Edward Helmore, *Tesla Behind Eight-Vehicle Crash Was in ‘Full Self-Driving’ Mode, Says Driver*, GUARDIAN (Dec. 22, 2022), <https://www.theguardian.com/technology/2022/dec/22/tesla-crash-full-self-driving-mode-san-francisco> [<https://perma.cc/V8C2-DAMT>].

²⁰³ Corn, *supra* note 200.

²⁰⁴ Guy Seidman & Aviv Gaon, *A Future without Human Driving*, 18 GEO. J.L. & PUB. POL’Y 503, 517 (2020).

²⁰⁵ WOOLDRIDGE, *supra* note 53, at 157.

²⁰⁶ Seidman & Gaon, *supra* note 204, at 525.

years, or 20 years?” cannot be predicted. The question is: What is the degree of autonomy required in AI to recognize AI as a separate legal entity and then attribute AI to the responsibility and accountability in the scenarios presented at the beginning of this chapter? Is it possible that one day, AI will reach human capabilities? Not only from a purely intellectual point of view but also from an emotional point of view? In other words, will the final goal of AI happen one day? The first step to establishing such a level of autonomy is to understand who is and who should be the owner of AI creations.

III. POSSIBLE LOCKEAN JUSTIFICATION TO AI

A. *The Labor Theory*

John Locke, a celebrated philosopher of the 17th century, elaborated a property theory known as the labor theory. This theory could be considered as the basis of property in modern society. Courts, scholars, and politics have been influenced throughout the centuries by Locke’s labor theory.²⁰⁷ The foundation of legitimate property, according to Locke, is based on the labor of the individual.²⁰⁸ In his political essay, *Second Treatise of Government*²⁰⁹, in chapter V, Locke attempts to justify how people become owners of natural common resources.²¹⁰ Locke explains that in the state of nature, before the existence of states, governments, and laws, there was an abundance of natural

²⁰⁷ Lior Zemer, *On the Value of Copyright Theory*, SSRN 1, 9 (2006).

²⁰⁸ Robert P. Merges, *Locke Remixed ;-*, 40 U.C. DAVIS L. REV. 101, 107 (2007).

²⁰⁹ JOHN LOCKE, *SECOND TREATISE OF GOVERNMENT* (Project Gutenberg eBook, ed. 2003), <https://www.gutenberg.org/files/7370/7370-h/7370-h.htm> [<https://perma.cc/DBL4-4YMZ>] (hereinafter *Second Treatise*).

²¹⁰ *Id.*; Lior Zemer, *Making of a New Copyright Lockean*, 29 HARV. J.L. & PUB. POL’Y 891, 913 (2006)

resources such as land and goods that were accessible to every human.²¹¹

Locke, through his labor theory, provides an explanation of how and why individuals become the owners of land and goods. To use such resources, with the purpose of feeding themselves by cultivating lands or hunting beasts, people must take control over the natural resources.²¹² According to Locke, people must acquire property to survive, flourish, and prosper and therefore execute the will of God.²¹³ Getting permission from everyone whenever an individual wants to take control over common resources is impossible. Thus, people must acquire private ownership.²¹⁴ Following Locke's perception, to acquire private ownership of these goods and lands accessible to all and commonly owned, people must mingle or join their labor to the resources. Only then people will appropriate the common resources and transform them into legitimate private property.²¹⁵ Locke summarizes his perception of property in the next passages:

Though the earth and all inferior creatures be common to all men, yet every man has a "property" in his own "person." This nobody has any right to but himself. The "labor" of his body and the "work" of his hands, we may say, are properly his. Whatsoever, then, he removes out of the state that Nature hath provided and left it in, he hath mixed his labor with it, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state Nature placed it in, it hath by this labor something annexed to it that excludes the common right of other men. For this "labor" being the unquestionable

²¹¹ Zemer, *supra* note 210, at 914.

²¹² ROBERT MERGES, JUSTIFYING INTELLECTUAL PROPERTY 34 (2011).

²¹³ *Id.* at 35.

²¹⁴ *Id.*

²¹⁵ Zemer, *supra* note 210, at 913–14.

property of the laborer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good left in common for others.²¹⁶ (emphasis added)

Locke argues that every individual naturally owns their own body, and by extension, owns the labor produced by their own body.²¹⁷ It is then logical that the individual should be the owner of the product of its own labor, produced with its own body.²¹⁸ The concept of Locke's labor theory claims that individuals ought to have the freedom to possess and manage the fruits of their labor. Locke supports his theory with the "labor-desert" argument, stating that, before being labored, nature has almost no value and only through labor value is created.²¹⁹ This argument is also known as the "value-added theory."²²⁰ Locke compares land that was improved, labored, and farmed to another piece of land that was not, and concludes that most of the value is the product of labor.²²¹ According to Locke, 99 percent of

²¹⁶ LOCKE, *supra* note 209, § 27, at 328–29.

²¹⁷ J.P. Day, *Locke on Property*, 16 PHIL. Q. 207, 208 (1966); Carys J. Craig, *Locke, Labour and Limiting the Author's Right: A Warning against a Lockean Approach to Copyright Law*, 28 QUEEN'S L.J. 1, 10 (2002).

²¹⁸ Edwin C. Hettinger, *Justifying Intellectual Property*, 18 PHIL & PUB AF. 31, 37–38 (1989).

²¹⁹ Roland Spitzlinger, *On the Idea of Owning Ideas: Applying Locke's Labor Appropriation Theory to Intellectual Goods*, 5 MASARYK U. J.L. & TECH. 273, 276 (2011).

²²⁰ Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L. J. 287, 305 (1988), <https://www.lls.edu/faculty/facultylisth-k/justinhughes/> [<https://perma.cc/J7JG-7W8U>] (Justin Hughes is a professor of law who specializes in intellectual property. Justin Hughes, LOYOLA MARYMOUNT UNIVERSITY).

²²¹ LOCKE, *supra* note 209, § 40.

the value is due to the labor²²² as he sees that labor as the principal source of value.²²³

Following Locke's theory, the individual has an inherent right to that work and to use it as he desires. Following this point of view, the individual should possess all production of their own intelligence and perseverance.²²⁴ The idea behind the labor theory is that people create property through their own labor and investment of time and resources. If someone mixes natural resources with their own labor, it then produces one single creation that qualifies it as the owner of that new and unique work. There is an argument known as the "mixing labor argument."²²⁵ Locke uses the mixing labor argument as a metaphor "*for the productive activities that man must engage in so that he can create the objects necessary for maintaining his life.*"²²⁶ (emphasis added) It implies that once the "natural resource" has been appropriated by the individual, whoever takes away his "creation" that is no longer a natural resource, is also taking away his work and labor that has been mixed with the natural resource. Therefore, he is benefiting the individual

²²² *Id.*; See Hettinger, *supra* note 218, at 37 (Hettinger criticized this point of view. From his perception, if someone pick an apple off a tree, he does not create 99 percent of the value. In fact, even an inventor or an artist who has a right to the product of his intellectual labor should not necessarily be the owner of all the IP rights; it is hard to distinguish the value created by the intellectual labor from the rest. However, the purpose of this chapter is to establish that following Locke's theory of property, IP laborers should also be entitled to be the owner of the product of their labor, even if it is an intellectual labor and no matter if the laborer should be the owner of all the creation or only one part of.).

²²³ Ian Shapiro, *Resources, Capacities, and Ownership: The Workmanship Ideal and Distributive Justice*, 19 POL. THEORY 47, 49 (1991).

²²⁴ Hettinger, *supra* note 218, at 36.

²²⁵ Jeremy Waldron, *The Right to Private Property*, J.L. & SOC'Y 184, 194 (1988).

²²⁶ Adam Mossoff, *Saving Locke from Marx: The Labor Theory of Value in Intellectual Property Theory*, 29 SOC PHIL & POL 283, 294 (2012).

fruit of labor even though he had no right to it.²²⁷ The perception of property was illustrated by Abraham Lincoln, who reiterated, “*Property is the fruit of labor; property is desirable, is a positive good in the world. That some should be rich, shows that other may become rich, and hence is just encouragement to industry and enterprise.*”²²⁸ (emphasis added)

B. Lockean IP

Through the labor theory, and according to several scholars, Locke refers only to manual and physical labor²²⁹ while, IP rights (non-physical) exist to protect intellectual labor or, in Adam Moore’s words, “the product of cognitive process.”²³⁰ Property is a notion used most of the time to refer to material and physical objects that human beings own. Nevertheless, today, people can own copyrights²³¹, literary works, movies, music, and poetry they have composed, computer software, architecture, designs of buildings, paintings, and other artistic works. People and companies can also file patents²³² for new and innovative inventions such as treatments, medical devices, and other technology in almost every field. Companies can choose to protect their secret business information under the category

²²⁷ Craig, *supra* note 217, at 10–11.

²²⁸ Oliver H. Dean, *The Law of the Land*, 48 AM. L. REV. 641, 666 (1914) (quoting Abraham Lincoln during an “address to the Working Men’s Association, in New York.”).

²²⁹ Mossoff, *supra* note 226, at 284.

²³⁰ Adam D. Moore, *A Lockean Theory of Intellectual Property* (1997) (Ph.D. dissertation, Ohio State University) (ProQuest).

²³¹ See Marshall J. Welch, *International Protection of Intellectual Property*, 1 TEX. INTELL. PROP. L. J. 41, 42 (1992).

²³² *Id.*

of trade secrets.²³³ Ownership of non-physical things exists through conventional IP protection.

Although John Locke has technically never written on IP rights, this theory has been frequently and systematically used to associate a right of ownership with the fruit of intellectual labor.²³⁴ Courts and scholars have repeatedly referred to Locke's theory of property as IP rights. Lior Zemer illustrated this perception when he wrote that "*A copyrighted work is a good, but it is also a manifestation of the person – of oneself.*"²³⁵ (emphasis added). This perception implies that an artistic work is the fruit of the author's intellectual labor. Courts in different jurisdictions have regularly linked labor with copyright and have recognized that the conception of ideas and their production requires labor, even if not physical.²³⁶

In the United States, in *Millar v Taylor*, it was ruled that "*It is just that an author should reap the pecuniary profits of his own ingenuity and labor; [...] It is fit, he should not only choose the time, but the manner of publication; how many; what volume; what print [...].*"²³⁷ (emphasis added) It means that an author should not only get a reward for his intellectual labor, but he also should have the ability to choose every use referring to his work. In the renowned *Feist Publications v. Rural Telephone Inc.* ("Feist"),²³⁸ although the United States Supreme Court rejected the "sweat of the brow"²³⁹ doctrine that led intellectual property

²³³ David S. Almeling, *Seven Reasons Why Trade Secrets Are Increasingly Important*, 27 BERKELEY TECH. L.J. 1091, 1095 (2012) (citations omitted).

²³⁴ See generally MERGES, *supra* note 212, at 8 (using Locke's labor theory to justify intellectual property rights).

²³⁵ Zemer, *supra* note 210, at 908.

²³⁶ Zemer, *supra* note 207, at 9.

²³⁷ 98 Eng. Rep. 201, 252 (1769).

²³⁸ *Feist Publ'ns v. Rural Telephone Serv. Co., Inc.*, 499 U.S. 340 (1991).

²³⁹ Jordan M. Blanke, *Vincent Van Gogh, "Sweat of the Brow", and Database Protection*, 39 AM. BUS. L.J. 645, 676 (2002).

scholars to see in Feist the rejection of Locke's theory of property in copyright law, yet the Court ruled that copyrights only protect "*the fruit of intellectual labor*" and "*are founded in the creative powers of the mind.*"²⁴⁰ (emphasis added). These examples explicitly illustrate that authors and inventors when they invent, write, paint or compose, are creating new, unique, original and creative artistic work of inventions which are the fruit of their intellectual labor. Such labor is protected in the same way as physical labor, through property.

Authors and scholars have also repeatedly viewed artistic work and inventions as the production of labor, referring to Locke's theory of property.²⁴¹ For example, Douglas Baird considered people to "*have the right to enjoy the fruits of their labor, even when the labors are intellectual.*"²⁴² Lior Zemer, elaborated that "*Labor is a core element in the assessment of creativity and copyright subsistence, and a copyrighted work as a collective enterprise requires physical, creative, and mental labor.*"²⁴³ Still according to Zemer, Locke himself wrote about IP rights when he invented the labor theory and was not focused only on physical object property.²⁴⁴ Jonathan Herman also refers to the fruit of intellectual labor while providing an analyze of the concept of copyrights.²⁴⁵ Adam Mossof,

²⁴⁰ *Feist Publ'ns*, 499 U.S. at 346.

²⁴¹ Hughes, *supra* note 220, at 301.

²⁴² Douglas G. Baird, *Common Law Intellectual Property and the Legacy of International News Service v. Associated Press*, 50 U. CHI. L. REV. 411, 413–14 (1983).

²⁴³ Zemer, *supra* note 210, at 916.

²⁴⁴ *Id.* at 911–12.

²⁴⁵ Jonathan Herman, *Moral Rights and Canadian Copyright Reform: The Impact on Motion Picture Creators*, 20 R.D.U.S. 407, 412 (1990).

The relationship between the artist and society may be characterized in straightforward economic terms: society places demand on its members to share with it the fruits of their intellectual labour. Artists supply those demands; however, if society recognizes an artist's

argued that it “*is an explicit invocation of Lockean property theory, particularly of the labor theory of value that functions as a central premise within Locke’s justification for property rights.*”²⁴⁶ (emphasis added).

It demonstrates there is no reason that intellectual labor would not be considered labor in the same way as physical labor. Consequently, individuals should enjoy all the fruits of their labor, including intellectual labor and the benefits resulting from it. Individuals should possess the fruit of their soul.²⁴⁷ However, it is important to understand that an idea or a concept is not copyrightable or patentable.²⁴⁸ The idea itself must be distinguished from the expression of the same idea. Only the expression of the idea, only the product of the cognitive process, only the labor of the fruit can be patented or copyrighted.²⁴⁹ Ideas are unlimited natural resources, commonly owned in the state of nature²⁵⁰ or as people regularly refer to it; the public domain.²⁵¹ When an author writes, draws, or paints new creations, the author takes information from the public domain.²⁵² According to Robert Merges, such information

right of ownership of his intellectual work, he may set conditions and exact a price for the society’s consumption of it. Copyright confers in the creator a monopoly to exploit his work in public for his own economic self-interest.

²⁴⁶ Mossof, *supra* note 226, at 293.

²⁴⁷ Shlomit Yanisky-Ravid, *The Hidden though Flourishing Justification of Intellectual Property Laws: Distributive Justice, National versus International Approaches*, 21 LEWIS & CLARK L. REV. 1, 9 (2017).

²⁴⁸ *See, e.g.*, 17 U.S.C. § 102(b) (1976). *New York Times Co. v. United States*, 403 U.S. 713 (1971) (Brennan, J. concurring) (“And the copyright laws, of course, protect only the form of expression, and not the ideas expressed.”); *Harper & Row, Publishers, Inc. v. Nation Enterprises*, 471 U.S. 539, 556 (1985) (“No author may copyright his ideas or the facts he narrates”).

²⁴⁹ Hettinger, *supra* note 218, at 32.

²⁵⁰ Zemer, *supra* note 210, at 914.

²⁵¹ MERGES, *supra* note 212, at 33.

²⁵² *Id.*

and the public domain are respectively the equivalent of Locke's perception of common resources, and the state of nature.²⁵³ By mixing labor or work with ideas that belong to the public domain, an artist creates a new and unique work.²⁵⁴ If so, as a conclusion, it could be said that IP law is the extension of Locke's theory of property as an author is mixing his labor with common resources. In this way, IP rights can be explained with the use of Locke's theory of labor.

However, Locke sets two fundamental conditions, also called "provisos," in his property theory which must be considered when trying to apply the labor theory to IP rights.²⁵⁵ The first condition determines that this right to property must not in any way deprive other people of their ability to use and acquire the resources necessary for their survival.²⁵⁶ The second condition provides that while individuals are appropriating, they must leave "enough and as good" for others to acquire.²⁵⁷ The second condition specifies that the appropriation by labor will be acceptable if it does not lead to waste and spoliation,²⁵⁸ as "*nothing was made by God to spoil or destroy.*"²⁵⁹ (emphasis added).

Let's start with the non-waste condition as several scholars note that proviso is missing when it comes to IP.²⁶⁰ Locke himself effectively illustrates the first condition with the use of food spoilage.²⁶¹ Regarding the non-waste condition when it comes to IP, the main argument is that there is no concern as non-physical work does not spoil at

²⁵³ *Id.*

²⁵⁴ *Id.* at 36.

²⁵⁵ *Id.* at 48–49.

²⁵⁶ Hughes, *supra* note 220, at 325.

²⁵⁷ See generally Locke, *supra* note 209, §§ 33–34.

²⁵⁸ *Id.* at § 31.

²⁵⁹ *Id.*

²⁶⁰ Hughes, *supra* note 220, at 328–29.

²⁶¹ *Id.* at 327.

all.²⁶² Ideas are unlimited, and every individual can infinitely consume ideas as much as they want.²⁶³ The conclusion is that ideas are “*free as the air*.”²⁶⁴ (emphasis added). On the other hand, a common argument is that it is not unlikely at all that a patent owner has patented an invention which he did not plan to use and therefore is worthless.²⁶⁵ As for the enough and as good condition, it could be explained in the context of IP as IP rights expire after a certain period so that others could use the ideas that have permitted to develop creations and inventions. An additional way to explain this proviso is by following the same interpretation used above for the non-waste condition, as ideas are unlimited and free as the air. Moore establishes an analogy between Locke’s example of the individual who drinks water from the river as if he took nothing at all,²⁶⁶ and an author or an inventor acquiring IP.²⁶⁷ The fact ideas are infinitely consumable makes the proviso applicable to IP.²⁶⁸

Before defining who should own AI creations in terms of IP, it is important to understand what the main objectives of IP protection are and if they match Locke’s labor theory. Intellectual property rights provide individuals protection for the fruit of their intellectual labor, such as new inventions, innovations, and artistic work formed in the mind of the individual from conception to practice. For what reason is it so important to have a legal doctrine protecting people’s creations and inventions?

Throughout the years, United States Courts have stated how much IP protection is vital for innovation,

²⁶² *Id.* at 327.

²⁶³ *Id.* at 12.

²⁶⁴ Zemer, *supra* note 210, at 922–23.

²⁶⁵ MERGES, *supra* note 212, at 57.

²⁶⁶ Locke, *supra* note 209, at § 33.

²⁶⁷ Adam D. Moore, *Intangible Property: Privacy, Power, and Information Control*, 35 AM. PHIL. Q. 365, 375 (1998).

²⁶⁸ Zemer, *supra* note 210, at 927.

progress, and science. As a matter of fact, IP protection is an exception to free competition, and IP rights are conferred to authors and inventors only when they are necessary to encourage them to invent.²⁶⁹ IP tries to balance free competition and property by granting protection for creations for a limited period. The purpose of IP is set out in the U.S. Constitution, which confers the United States Congress the power to create IP rights, “*To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.*”²⁷⁰ Courts also have constantly defined IP purposes such as copyright and patent. In *Mazer v. Stein*, the Supreme Court stated:

The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in ‘Science and useful Arts.’²⁷¹

In *Sony Corp. of Am v. Universal City Studios, Inc.*, the Court defined the purpose of copyright as it “*intended to motivate the creativity activity of authors and inventors by the provision of a special reward and allow the public access to the products of their genius after the limited period of exclusive control has expired.*”²⁷² (emphasis added). While the court in *Sony Corp.* defined copyright’s purpose, in *Impression Prod., Inc. v. Lexmark Int’l, Inc.*, the Court

²⁶⁹ Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX L. REV. 1031, 1032 (2005).

²⁷⁰ U.S. CONST. art. I, § 8, cl. 8; *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 511 (1917) (“[T]he primary purpose of that law is not to create private fortunes but is to promote the progress of science and the useful arts.”)

²⁷¹ *Mazer v. Stein*, 347 U.S. 201, 219 (1954).

²⁷² *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

established that Patent and Copyright have practically the same purpose.²⁷³ *Sony Corp.* emphasizes that balance between free competition by allowing the public access to more knowledge, and to the natural right of property as explained by Locke. Similarly, in *Diamond v. Am-Law Publishing Corp.*, the Court stated that “*The principal purpose of the legislation is to encourage the origination of creative works by attaching enforceable property rights to them. Absent such property rights, creation would be discouraged by the ease of reproduction and use without the permission of the author.*”²⁷⁴ Even in Canada, the Court in *Theberge v. Galerie d’art du Petit Champlain Inc.*, the Supreme court defined the purpose of The Copyright Act as, “*a balance between promoting the public interest in the encouragement and dissemination of works of the arts and intellect and obtaining a just reward for the creator.*”²⁷⁵ The purpose of promoting the progress of science and useful arts is the main reason why after a certain period, the IP rights are released into the public domain.²⁷⁶ Additionally, it is preferred that people create rather than imitate. For this reason, if the cost of creating is high, IP protection to incentive people to invent and create is essential.²⁷⁷

In conclusion, from the different definitions provided by Courts, it can be deduced that IP protection has two goals. Firstly, to motivate authors and inventors to continue to

²⁷³ *Impression Prods. v. Lexmark Int’l, Inc.*, 581 U.S., 360, 363, 378 (2017) (citing *Bauer & Cie v. O’Donnell*, 229 U.S. 1, 13 (1913)).

²⁷⁴ *Diamond v. Am-Law Publ’g Corp.*, 745 F.2d 142, 147 (2d Cir. 1984).

²⁷⁵ *Theberge v. Galerie d’Art du Petit Champlain, Inc.*, [2002] 2 S.C.R. 336 (Can.).

²⁷⁶ *Eldred v. Ashcroft*, 537 U.S. 186, 223 (2003) (“But the requirement that those exclusive grants be for ‘limited Times’ serves the ultimate purpose of promoting the ‘Progress of Science and useful Arts’ by guaranteeing that those innovations will enter the public domain as soon as the period of exclusivity expires . . .”).

²⁷⁷ Mark A. Lemley, *IP in a World without Scarcity*, 90 N.Y.U. L. REV. 460, 482 (2015).

create by incentivizing them with a reward. Secondly, to release the product of people's genius into the public domain after a specific limited period. Patent law has, therefore, established a balance between giving motivation to inventors and a competitive economy for the public.²⁷⁸ A balance that permits to promote the progress, research, and development of science, technology, and art, all of which benefits the entire society and human civilization.

Intellectual property rights encourage people and incentivize them to invest time, effort, energy, and resources to create and develop new projects, inventions, and artistic works. All these new non-physical creations are advantageous for society as they benefit each one of us. Patented inventions and copyrighted creations improve human quality of life, human productivity, and human culture, and they help humanity treat diseases and develop new medicines and treatments. Artistic creations such as painting, literature, music, and films are part of our culture and permit people to take enjoyment from these creations protected by intellectual property rights. It is for the benefit of society that governments and legislators around the world have the power to grant IP rights.

The labor theory and its principles have also been used to explain and justify the protection of intellectual property rights as it justifies why individuals should own their creations that are the product of their minds. There are two interpretations of the labor theory: The normative and the instrumental interpretations.²⁷⁹ The instrumental interpretation of Locke's theory is that without a clear incentive, people will not labor at all.²⁸⁰ It means that individuals need rewards to be encouraged and motivated to work and labor, and this is the reason why society incentives and promotes labor with property. On the other hand, the

²⁷⁸ *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974).

²⁷⁹ Hughes, *supra* note 220, at 296.

²⁸⁰ GAON, *supra* note 37, at 68–69.

normative interpretation of the labor theory is simply that people should be compensated for their labor.²⁸¹ It means that people work hard, invest time, energy, and perseverance, and that unpleasant hard work should simply be rewarded. There is no wrong answer; both interpretations provide a valuable reason to grant IP rights.

Before establishing a new paradigm regarding AI creation protection, it is important to be certain that these new ownership regimes are in accordance with IP purposes. As stated by the United States Supreme Court, “*when technological change has rendered its literal terms ambiguous, the Copyright Act must be construed in light of its basic purpose.*”²⁸² By granting human beings exclusive rights on AI copyrightable creations or patent inventions, the IP purposes of incentive and encouragement for creators to continue to create but also allowing the continuation of progress of science and art are respected. Regarding the fourth age of AI, when AI will be totally independent of human action and intervention, it is important to understand the implication of granting IP rights to AI. For example, giving AI and machines copyrights could make no sense if AI does not reach strong AI as Weak AI does not need incentives and does not need to be encouraged to invent or generate any content; AI is not interested in money or any other reward. Unlike humans, AI does not need recognition for its work. In addition, it is unclear what the AI lifetime is when considering the period of protection for copyright. Following IP protection purposes, establishing AI as an owner of its creation is nonsensical, at least, until AI reaches human capabilities and aptitudes such as consciousness.

IP rights can be considered as the extension of Locke’s labor theory. IP rights are conferred to people to protect the product of their intellectual labor, just as property

²⁸¹ Hughes, *supra* note 220, at 303.

²⁸² *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975).

on cultivated land is granted to protect the product of physical labor. As aforementioned, Courts and writers have recognized that labor is labor, even if it is intellectual labor. The purposes of IP rights are to encourage the creativity of authors and inventors, to promote science and art progress, and to give the public a competitive economy. All of these are reasons why the right of intellectual labor is protected for a limited period, and the intellectual labor is released to the public domain when the time period has expired. Locke's theory of property and the purpose of intellectual property protection form the basis that will help to answer the main question asked here: Who should own AI creations? It means that when it comes to establishing different ownership regimes, two principal questions must be considered: Who is the intellectual laborer? And who should be incentivized and encouraged to create and innovate?

C. The Workmanship Machine Model

If it is agreed that there is no reason to distinguish physical labor from intellectual labor, and both should provide property, then Locke's labor theory should be applied to intellectual property. Following this perception, a justification for granting humans traditional IP rights on AI creations with human contribution can be based on Locke's labor theory. Granting conventional IP rights to the AI creator for the investment of work, energy, and time matches Locke's perception. What will happen when strong AI creates its own creations and inventions without any human contribution and intervention? It is crucial to understand how Locke's theory of property could support a basis for a potentially strong AI to become the owner of its own creations. Conferring one day strong autonomous AI, probably in the fourth age, ownership rights on its own creations must be based on an elaborate theoretical basis.

This basis could be established by making an analogy with Locke’s Workmanship Model.²⁸³ The model is explained by Locke with the following words: “*For Men being all the Workmanship of one Omnipotent, and infinitely wise Maker; All the Servants of one Sovereign Master, sent into the World by his order and about his business, they are his Property, whose Workmanship they are, made to last during his, not one another pleasure.*”²⁸⁴

According to Locke, humans are the product of God, and therefore, its property, just as the rest of the universe. God has created the universe and humanity, implying that “laboring” is initially a divine quality. The reason human beings have human capabilities such as laboring is resulting from the fact they are God’s product.²⁸⁵ The capacity of creation as a human aptitude has been seen as a gift given by God, as he created humans with the ability to make and create.²⁸⁶ Humans are the property of God simply in the same way as human creations are human’s property.²⁸⁷ Human beings are not totally creating something new when they mix their labor with natural resources.²⁸⁸ The closest analogy to God’s creation is when humans give birth to new and unique human beings.²⁸⁹

Although humans are not literally giving birth to AI, the process of creation and the way AI is “educated” through trained data and machine learning could be considered as the basis for that analogy. If AI is perceived as the product of humans and, therefore, as their own property, an analogy could be made. The relation between the human being and

²⁸³ JAMES TULLY, A DISCOURSE ON PROPERTY: JOHN LOCKE AND HIS ADVERSARIES, 35–42 (1980).

²⁸⁴ LOCKE, *supra* note 209, § 6.

²⁸⁵ MERGES, *supra* note 212, at 44.

²⁸⁶ Shapiro, *supra* note 223, at 49.

²⁸⁷ *Id.* at 50.

²⁸⁸ Zemer, *supra* note 210, at 937.

²⁸⁹ James Bernard Murphy, *The Workmanship Ideal: A Theologico-Political Chimera?*, 20 POL. THEORY 319, 321 (1992).

AI is the same relation existing between God and the human being. Humans are creating AI with the vision that one day, they will probably have human capabilities because humans want to create them as a human extension.²⁹⁰ All AI characteristics such as speech recognition, robotics, natural language processing, and the attempt to replicate the human brain using neural networks, are all proving how much men are seeking to create a new entity as an extension to humanity.²⁹¹ If it could be said that humans are the extension of God, and God created humans with its own abilities to create, it could be derived that AI in its most powerful version will be the extension of humans. The human-AI relation could be perceived as the continuation of the God-human relation. If so, AI could potentially one day become the owner of its own creations.

Regarding the analogy between humans-AI relation and God-humans relation, it is important to note that according to AI capacities today, and as AI has already been defined as weak, it is apparent that AI is not a conscious entity with free will. AI is the fruit of the development of human programming and engineering, and just as Searle proved to us, it can simulate intelligence and creativity, but it does not have the same level of agency as humans do.²⁹² Therefore, the analogy between God and humans could be applied to the relationship between humans and AI only when AI becomes strong and reaches human capabilities.

According to Locke, human beings were created by God, and as God's creation, human beings are God's property.²⁹³ According to James Tully, it is undeniable that

²⁹⁰ *Generally*, Priyadarshini Acharjee, *AI: An Extension of Human Quality*, MEDIUM (Sep. 6, 2020), <https://medium.com/dsckiit/ai-an-extension-of-human-quality-33aec5735ab2> [<https://perma.cc/XHB6-G5WQ>].

²⁹¹ *Id.*

²⁹² Searle, *supra* note 160.

²⁹³ TULLY, *supra* note 283, at 37.

“a maker has a right in and over his workmanship.”²⁹⁴ It means that when human beings labor, they own their own labor and creations. The same expression of that relation between God and human beings can confront us in 100 years when humans are able to create the same extension embodied in a machine. It would mean that AI, as men’s creations, are already human property. However, when AI can labor by itself in a fully autonomous way, AI will own its own labor and creations. Such capacity of intellectual labor will be reached by AI only when it becomes AC. AI without consciousness will never be able to create new, original, and creative creations. It started with “*God as maker and man as his workmanship*.”²⁹⁵ From this perception, the labor theory has been created, and humans as makers are the owners of their own creations, and the next step will be AI as a maker and owner of its own creations. Only then granting AC conventional IP rights will be justified regarding IP purposes, as AC may potentially have the need to be compensated for their work. This is the theoretical justification for potentially granting AC full IP rights and protection. Such a possibility will happen only when the fourth age of AI is reached.

IV. THE PARAMETERS OF AI OWNERSHIP

A. *Machines Capacity*

Courts are required to face AI and non-human creation ownership issues. The law cannot keep up with the exponential pace of technology and evolve in parallel with AI capabilities. An analysis is required of how much the current legal framework is still relevant and the presentation of the first AI ownership right corresponding to the first and

²⁹⁴ *Id.* at 42.

²⁹⁵ John Simmons, *Makers’ rights*, 2 J. ETHICS 197, 199 (1998).

second ages of AI. The exclusive ownership right is the application, as is, of current law in some parts of the world. This chapter will expose the capacity of the second and third ages of AI in terms of the creation and generation of content and artistic work. This type of AI is, as previously mentioned, still controlled by humans without human cognitive attributes. The regime of exclusive ownership is the applicable regime proposed here to adopt for first and second age AI, in which AI creations must be owned exclusively by the company or the person that created that new AI creator. In other words, if AI stays weak and human contributions can be easily identified, the owner of the AI creations should be no one else other than “the creator of the creator.”

Open AI, the company owned partially by Microsoft, is currently the most attractive company in the world²⁹⁶, while Dall-E²⁹⁷, one of Open AI’s applications, permits each one of us to generate a picture from text in the style of Andy Warhol or Vincent Van Gogh,²⁹⁸ ChatGPT²⁹⁹, another Open AI application became viral and has become one of the most

²⁹⁶ Hayden Field, *Meta, OpenAI, Anthropic and Cohere A.I. models all make stuff up- here’s which is worst*, CNBC (Aug. 23, 2023) <https://www.cnbc.com/2023/08/17/which-ai-is-most-reliable-meta-openai-anthropic-or-cohere.html> [<https://perma.cc/2YRS-BD5V>].

²⁹⁷ *Dall-E: Creating Image from text*, OPENAI, <https://openai.com/research/dall-e> [<https://perma.cc/2XRJ-CQUL>] (last visited Apr. 24, 2024).

²⁹⁸ See Devin Coldeway, *OpenAI’s DALL-E Creates Plausible Images of Literally Anything You Ask it to*, TECH CRUNCH (Jan. 6, 2021), <https://techcrunch.com/2021/01/05/openais-dall-e-creates-plausible-images-of-literally-anything-you-ask-it-to/> [<https://perma.cc/87FS-Z3E7>]; Jeff Hayward, *Famous Paintings ‘Re-created’ by other Famous Artists, Using DALL-E AI*, Medium (Sept. 12, 2022), <https://medium.com/@jeffhaywardwriting/famous-paintings-re-created-by-other-famous-artists-using-dall-e-ai-c0068b386d59> [<https://perma.cc/J3G3-JF7F>].

²⁹⁹ *Introducing ChatGPT*, OPENAI (Nov. 30, 2022), <https://openai.com/blog/chatgpt> [<https://perma.cc/3DMG-AVAN>].

used applications all over the world. During the first two months after its launch, ChatGPT reached 100 million users.³⁰⁰ In comparison, it took nine months for Tik-Tok to reach 100 million users.³⁰¹ ChatGPT could be used as a research motor and/or as a generator of texts, songs, codes³⁰² legal agreements³⁰³ and essays³⁰⁴. ChatGPT is already outperforming Google's motor of research.³⁰⁵ In addition, ChatGPT is used by hackers to create codes, and students are already using the chatbot to generate homework and

³⁰⁰ DANIEL MARTIN KATZ ET AL., *GPT-4 Passes the Bar Exam*, SSRN 2 (Mar. 15, 2023), <https://ssrn.com/abstract=4389233> [<https://perma.cc/87BZ-H4RT>].

³⁰¹ Alexandra Garfinkle, *ChatGPT on track to surpass 100 million users faster than TikTok or Instagram: UBS, YAHOO* (Feb. 2, 2023), <https://finance.yahoo.com/news/chatgpt-on-track-to-surpass-100-million-users-faster-than-tiktok-or-instagram-ubs-214423357.html?guccounter=1> [<https://perma.cc/7E6N-QV8L>].

³⁰² Amit Katwala, *ChatGPT's Fluent BS Is Compelling Because Everything Is Fluent BS*, WIRED, (Dec. 9, 2022) <https://www.wired.com/story/chatgpt-fluent-bs/> [<https://web.archive.org/web/20240103232526/https://www.wired.com/story/chatgpt-fluent-bs/>].

³⁰³ Jack Shepherd, *Chat GPT for Contract Drafting: AI v. Templates*, MEDIUM (Feb. 9, 2023), <https://jackwshepherd.medium.com/chat-gpt-for-contract-drafting-ai-v-templates-50ec8fd42f44> [<https://perma.cc/WAL6-HQWL>].

³⁰⁴ Alex Hern, *AI Bot ChatGPT Stuns Academics With Essay-Writing Skills and Usability*, THE GUARDIAN (Dec. 4, 2022), <https://www.theguardian.com/technology/2022/dec/04/ai-bot-chatgpt-stuns-academics-with-essay-writing-skills-and-usability> [<https://perma.cc/LV63-BLLT>].

³⁰⁵ Grace Kay, *Gmail Creator Warns Google Is 'Only a Year or Two Away From Total Disruption' because of AI like ChatGPT*, BUSINESS INSIDER (Feb. 1, 2023), <https://www.businessinsider.com/gmail-creator-google-search-faces-total-disruption-chatgpt-ai-chatbot-2023-2#:~:text=Gmail%20creator%20warns%20Google%20is,because%20of%20AI%20like%20ChatGPT&text=Gmail%20creator%20Paul%20Buchheit%20says,make%20Google's%20search%20engine%20irrelevant> [<https://perma.cc/T77J-RWRV>].

essays.³⁰⁶ Both applications are AI trained by massive data that affords to provide humans with such results. Resulting from a new experience, the GPT program has been connected to a robot that has succeeded to materialize very realistic human facial expressions.³⁰⁷

To understand the outstanding capacities of this language processing model, I asked ChatGPT to compose a song about two friends, Jonathan and Kevin, two lawyers who are depressed because the football World Cup tournament has come to an end. The following words are the words of the song; the result is unbelievable, while the chatbot capacity is improving every day.

Verse 1:

Jonathan and Kevin, two friends so true
Lawyers by day, but football fans through and through.
They loved to watch the game, no matter the score.
But now the World Cup's over, they can't take it anymore.

Chorus:

Oh, Jonathan and Kevin, they're feeling low.
World Cup's finished and they don't know what to .do.
But they'll stick together, through thick and thin.
Jonathan and Kevin, till the next World Cup begins.

³⁰⁶ Ryan Browne, *All you Need to Know About ChatGPT, the A.I. Chatbot that's Got the World Talking and Tech Giants Clashing*, CNBC (Apr. 17, 2023), <https://www.cnbc.com/2023/02/08/what-is-chatgpt-viral-ai-chatbot-at-heart-of-microsoft-google-fight.html> [<https://perma.cc/XZ3S-E9ZK>].

³⁰⁷ Victor Tangermann, *They Put GPT-3 Into That Robot With Creepily Realistic Facial Expressions and Yikes*, FUTURISM, THE BYTE (Sep. 14, 2022), <https://futurism.com/the-byte/gpt-3-ameca-robot-facial-expressions> [<https://perma.cc/VRP4-BUJT>].

Verse 2:

They used to sit and cheer, as the players ran and kicked. But now the field is empty, and their spirits are nicked. No more goals to cheer, no more matches to win. But Jonathan and Kevin, they'll find a way to grin.

Chorus:

Oh, Jonathan and Kevin, they're feeling low.
The World Cup's finished and they don't know what to do. But they'll stick together, through thick and thin.
Jonathan and Kevin, till the next World Cup begins.

Besides text-to-image AI and other chatbots, there are new applications such as Google's Imagen video³⁰⁸ and Meta's Make-a-video.³⁰⁹ These are applications that allow people to generate videos from text.³¹⁰ Lensa, an AI application developed by Prisma Labs creates "magic avatars" by reinterpreting user photos with artistic styles³¹¹, and Mid-journey³¹² is another "text to image" AI application

³⁰⁸ Imagen Video, GOOGLE, <https://imagen.research.google/video/> [https://perma.cc/VNC4-VSKM] (last visited Apr. 24, 2024).

³⁰⁹ Make-A-Video, META, <https://makeavideo.studio/> [https://perma.cc/YRL7-WQKB] (last visited Apr. 24, 2024).

³¹⁰ Kyle Wiggers, *Google answers Meta's video-generating AI with its own, dubbed Imagen Video*, TECH CRUNCH (Oct. 5, 2022), <https://techcrunch.com/2022/10/05/google-answers-metas-video-generating-ai-with-its-own-dubbed-imagen-video/> [https://perma.cc/TJ38-FSMD].

³¹¹ Anca Ulea, *What is the Lensa app and why are artists worried about it?*, EURONEWS (Dec. 15, 2022), <https://www.euronews.com/culture/2022/12/15/what-is-the-lensa-app-and-why-are-artists-worried-about-it> [https://perma.cc/DKQ4-YDVA].

³¹² TJ McCue, *Midjourney AI Based Art Generator Creates Dazzling Images From Words*, FORBES (Jan. 23, 2023), <https://www.forbes.com/sites/tjmccue/2023/01/23/midjourney-ai-based-art-generator-creates-dazzling-images-from-words/?sh=1056814a5f61> [https://perma.cc/9KK2-E9NV].

in the style of Dall-E generating pictures from texts. The number of AI applications generating content is exploding and the quality of the content will not leave any choice other than to define a new hierarchy of IP rights regarding AI creations.³¹³ It is still important to be careful regarding the veracity of the information provided by AI tools such as ChatGPT.³¹⁴ For example, lawyers in New York are facing sanctions after they cited non-existing cases in court that were provided by ChatGPT.³¹⁵

In addition to the types of AI applications described above, permitting people to generate creations by only asking AI to do so, the amazing development of AI machine learning's sub-techniques such as deep learning, have led to other types of AI learning and generating methods with exceptional capacity of creation. As previously mentioned, the new AI, known as generative AI, can compose songs and generate original music, as well as generate paintings or write articles, essays, and papers at a level that a human could not discern whether it had been created by a human or by a machine. It means that AI today can create, and sometimes these creations are indistinguishable from human creations.³¹⁶ Let's highlight a few examples to illustrate this phenomenon.

The first innovative example of AI creation was developed by Sony CSL Research Laboratory, who

³¹³ See generally *Generative AI Navigating Intellectual Property*, WIPO, https://www.wipo.int/export/sites/www/about-ip/en/frontier_technologies/pdf/generative-ai-factsheet.pdf [https://perma.cc/V38C-E8B9] (last visited Apr. 24, 2024).

³¹⁴ Molly Bohannon, *Lawyer Used ChatGPT In Court—And Cited Fake Cases. A Judge Is Considering Sanctions*, *FORBES* (June 8, 2023) <https://www.forbes.com/sites/mollybohannon/2023/06/08/lawyer-used-chatgpt-in-court-and-cited-fake-cases-a-judge-is-considering-sanctions/?sh=5c0e49717c7f> [https://perma.cc/QR2N-E7A7].

³¹⁵ *Id.*

³¹⁶ Snapes, *supra* note 186.

developed an AI known as “Flow-Machine”.³¹⁷ Flow-Machine, based on a massive dataset of 13,000 songs can generate pop music in the Beatles’ style.³¹⁸ With a database of thousands of songs, Flow-Machine studies by itself how to compose music.³¹⁹ One of Flow-Machine’s best achievements was the creation of “Daddy’s Car”, a hit with over three million views on YouTube that makes humanity remember the best years of the world-famous group.³²⁰ Flow-Machine is not the only AI system with the capacity of generating music. AIVA (Artificial Intelligence Virtual Artist),³²¹ Jukedeck,³²² and MuseNet³²³ are only a few examples of modern AI systems designed to compose and generate original new music. By analyzing various musical

³¹⁷ Patrick Zurth, *Artificial Creativity? A Case Against Copyright Protection for AI-Generated Works*, 25 UCLA J.L. & TECH. 1, 2 (2021); *AI Makes Pop Music*, FLOW MACHINES (Sept. 19, 2016), <https://www.flow-machines.com/history/events/ai-makes-pop-music/> [https://perma.cc/2J95-EAPD].

³¹⁸ Michaela Cabrera, *Sony Develops Algorithm Based AI Music*, REUTERS (Oct. 17, 2016) <https://www.reuters.com/article/idUSKBN12H1ST/> [https://perma.cc/C4DQ-SQYC].

³¹⁹ *Id.*

³²⁰ Sony CSL (Paris), *Daddy’s Car: A Song Composed by Artificial Intelligence - In the Style of the Beatles*, YOUTUBE (Sep. 9, 2016) https://www.youtube.com/watch?v=LSHZ_b05W7o [https://perma.cc/UE4U-Q7LC].

³²¹ Whittle, *supra* note 39, at 63; *See also AIVA: The Artificial Intelligence Composing Emotional Soundtrack Music*, AIVA, <http://www.aiva.ai/> [https://perma.cc/VN7X-3W7X] (last visited Apr. 24, 2024).

³²² Whittle, *supra* note 39, at 63; Emma Featherstone, *Introducing the Next Generation of Music Makers*, THE GUARDIAN (Aug. 29, 2017) <https://www.theguardian.com/small-business-network/2017/aug/29/computer-write-music-jukedeck-artificial-intelligence> [https://perma.cc/3MKJ-WXN7].

³²³ Keri Grieman & Joseph Early, *A Risk-Based Approach to AI Regulation: System Categorisation and Explainable AI Practices*, 20 SCRIPTED 56, 75 (2023), Mark A. Lemley & Bryan Casey, *Fair Learning*, 99 TEX. L. REV. 743 (2021).

genres using deep learning algorithms, AIVA learns to create music that can imitate the genre and the style of hip-hop musicians, but also classical musicians as Bach or Beethoven.³²⁴ Jukedeck was bought by the owner of TikTok and uses a neural network trained on a huge database of various music, lyrics, and other music information to produce audio.³²⁵

AI's generative capabilities do not stop at music, another unbelievable AI creation, built in the last couple years, is known as "The Next Rembrandt Project."³²⁶ It is a machine learning model developed using a substantial dataset of Rembrandt's artwork. The AI was fed with an abundance of data (Rembrandt paintings) that permitted the AI to learn about Rembrandt's art style.³²⁷ After being trained, the AI was able to generate and create new independent creations very similar in style to the artist himself.³²⁸

³²⁴ Natalia Drozdiak, *The Loneliness of a Highbrow Teenage Songwriting Robot*, YAHOO (Nov. 26, 2019) <https://finance.yahoo.com/news/loneliness-highbrow-teenage-songwriting-robot-111500888.html> [<https://perma.cc/BBZ3-ALPE>].

³²⁵ Alex Marshall, *From Music to Pop Hits, A.I. Is Music to Some Ears*, THE NEW YORK TIMES (Jan. 22, 2017) <https://www.nytimes.com/2017/01/22/arts/music/jukedeck-artificial-intelligence-songwriting.html> [<https://perma.cc/JUL2-PA2B>].

³²⁶ Yanisky-Ravid, *supra* note 40, at 663; See *A 'New' Rembrandt: From the Frontiers of AI and Not the Artist's Atelier*, NPR (Apr. 6, 2016) <https://www.npr.org/sections/alltechconsidered/2016/04/06/473265273/a-new-rembrandt-from-the-frontiers-of-aiand-not-theartists-atelier> [<https://perma.cc/PAM6-E2YK>]; See also *The Next Rembrandt*, VML, <https://www.vml.com/work/next-rembrandt> [<https://perma.cc/KM2K-K8WD>] (last visited Apr. 24, 2024).

³²⁷ *A 'New' Rembrandt: From the Frontiers of AI and Not the Artist's Atelier*, NPR (Apr. 6, 2016) <https://www.npr.org/sections/alltechconsidered/2016/04/06/473265273/a-new-rembrandt-from-the-frontiers-of-aiand-not-theartists-atelier> [<https://perma.cc/PAM6-E2YK>].

³²⁸ *Id.*; See also *The Next Rembrandt*, YOUTUBE (Apr. 5, 2016) <https://www.youtube.com/watch?v=IuygOYZ1Ngo&t=3s> [<https://perma.cc/88HT-WGAH>].

Nevertheless, the most impressive AI learning method is called Generative Adversarial Network (“GAN”).³²⁹ GAN is currently the closest AI to strong AI as two different machines “communicate” together. GAN is an innovation developed by AI researcher Ian Goodfellow and his colleagues in 2014.³³⁰ GAN is a machine learning technique that employs two different and distinctive trained neural networks,³³¹ competing whilst also operating within a framework.³³² After the output has been determined, the first machine (generator) generates an output based on the trained data. The image generated by the generator is transferred to the second machine (the discriminator).³³³ The discriminator analyzes the image authenticity and must discern between false and real images.³³⁴ These analyses are perceived by the generator as feedback and, following the analysis, the generator learns how to improve its creation.³³⁵ The viral website, “thispersondoesexist.com”, where human faces that do not exist are found, is also based on that

³²⁹ Ian J. Goodfellow et al., *Generative Adversarial Nets*, 27 *PROC. NEURAL INFO. PROCESSING SYSTEMS* 1, 1–2 (2014).

³³⁰ Will Knight, *Invented a way for neural networks to get better by working together*, *MIT TECHNOLOGY REV.* (Aug. 16, 2017) <https://www.technologyreview.com/innovator/ian-goodfellow/> [<https://perma.cc/3Y7B-EPGU>].

³³¹ Goodfellow et al., *supra* note 329, at 2–3.

³³² Steven M. Bellovin, Preetam K. Dutta & Nathan Reitering, *Privacy and Synthetic Datasets*, 22 *STAN. TECH. L. REV.* 1, 31 (2019).

³³³ Goodfellow et al., *supra* note 329, at 3.

³³⁴ Antonia Creswell et al., *Generative Adversarial Networks: An Overview*, 35 *IEEE SIGNAL PROCESSING MAG.* 53, 53 (2018).

³³⁵ Marco Del Pra, *Generative Adversarial Networks*, *MEDIUM* (Oct. 30, 2023) <https://medium.com/@marcodelpa/generative-adversarial-networks-dba10e1b4424> [<https://perma.cc/ATB7-ZRH3>].

technology.³³⁶ It is practically impossible to discern AI paintings from real pictures.³³⁷

Still based on this method, you can find “*Edmond de Belamy, from La Famille de Belamy*.”³³⁸ This is a portrait of a fictive family created by “Obvious” using the GAN technique.³³⁹ The generator is based on a data set of 15,000 portraits and after painting a portrait, the discriminator tries to distinguish between a portrait produced by the generator and one that was created by a person.³⁴⁰ The generator gets the results and learns to improve its painting alone.³⁴¹ The generator continues to improve the painting until the discriminator is unable to discern between a human made portrait and a portrait created by the generator.³⁴² On October 25th, 2018, “*Edmond de Belamy, from La Famille de Belamy*,” was sold by Christie’s in New York for 432,500 dollars.³⁴³ Apart from this sale, “By 2025, AI-generated revenue is estimated to be up to \$126 billion,” then the potential of the AI creations market can be understood.³⁴⁴

³³⁶ Rachel Metz, *These people do not exist. Why websites are churning out fake images of people (and cats)*, CNN (Feb. 28, 2019) <https://www.cnn.com/2019/02/28/tech/ai-fake-faces/index.html> [<https://perma.cc/CMN9-F7WS>].

³³⁷ See generally Goodfellow et al., *supra* note 329, at 2672.

³³⁸ William Falcon, *What Happens Now That An AI-Generated Painting Sold For \$432,500?*, FORBES (Oct. 25, 2018) <https://www.forbes.com/sites/williamfalcon/2018/10/25/what-happens-now-that-an-ai-generated-painting-sold-for-432500/?sh=6826cc4fa41c> [<https://perma.cc/H3N4-JBEK>].

³³⁹ *Id.*; See Obvious, *Obvious, explained.*, MEDIUM (Feb. 14, 2018), <https://medium.com/@hello.obvious/ai-the-rise-of-a-new-art-movement-f6efe0a51f2e> [<https://perma.cc/NME9-EMCA>].

³⁴⁰ Christie’s, *Is artificial intelligence set to become art’s next medium?*, CHRISTIE’S (Dec. 12, 2018) <https://www.christies.com/en/stories/a-collaboration-between-two-artists-one-human-one-a-machine-0cd01f4e232f4279a525a446d60d4cd1> [<https://perma.cc/LUL7-8KT8>].

³⁴¹ Del Pra, *supra* note 335.

³⁴² Falcon, *supra* note 338.

³⁴³ Falcon, *supra* note 338.

³⁴⁴ Zurth, *supra* note 317, at 1–2.

There is no doubt that it could be a huge incentive to big technology companies to continue to develop and invest in the field of AI. The same company that created “*Edmond de Belamy, from La Famille de Belamy*,” have also used AI, and more particularly the GAN technique, to create a series of Japanese paintings named “*Electric Dreams of Ukiyo*.”³⁴⁵

Does asking ChatGPT to compose a song for you make you the song’s owner through copyright protection? ChatGPT as an AI system composed the song, so does that make ChatGPT the owner of the song? OpenAI has created ChatGPT, then in its turn has composed the song, should OpenAI be the copyrights owner? Who should own the “Portrait of Edmond de Belamy”, or the music generated by AIVA or Flow Machine? The composition, writing and painting level and quality of these artworks make us ask who should enjoy from IP protections benefits in AI creations? It would be difficult if not impossible for any human to make the distinction between humans and AI artworks.³⁴⁶ As will be demonstrated later, following today’s legal situation in most jurisdictions, the owner of all these creations cannot be the AI itself, as it is not a human being. Following the current framework of law in some common law countries, the only owner of AI creations would be OpenAI, Sony, Google, Meta or any other company or programmer that created the AI in the beginning.³⁴⁷

³⁴⁵ Gauthier Vernier et al., *Electric Dreams of Ukiyo: A series of Japanese Artworks Created by an Artificial Intelligence*, 1 PATTERNS 1, 1 (2020).

³⁴⁶ Andres Guadamuz, *Artificial intelligence and copyright*, WIPO MAG. (Oct. 2017) https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html [<https://perma.cc/K49J-KRRU>].

³⁴⁷ Annemarie Bridy, *The Evolution of Authorship: Work Made by Code*, 39 COLUM. J.L. & ARTS 395, 400–01 (2016).

B. Contemporary Applicability

Are or should AI creations be protectable by copyright and AI inventions be protectable by patents? If yes, who is or should be the legitimate owner of the copyright/patents on these creations/inventions? Most jurisdictions in the majority of countries have determined only human created works and inventions can be protected by IP rights.³⁴⁸ It makes no difference if it is an artistic work that could be copyrighted or a new technology invention that could be patented, according to most jurisdictions, only a human being can be the authors or inventor of something that is protectable by IP rights³⁴⁹

It is imperative, when trying to understand legal rights regarding AI creations, to make a distinction between AI creations generated with the intervention of a human being (human assisted creations) and AI creations produced without human intervention.³⁵⁰ The new hierarchy of rights regarding AI creations should depend on AI capacity to create with or without human intervention and on its level of autonomy. In the revised Issues Paper on Intellectual Property Policy and Artificial Intelligence, prepared by the WIPO Secretariat, it is stated that output “generated autonomously by an AI,” are to be distinguished from “AI-assisted” outputs.³⁵¹ The same has been declared by The

³⁴⁸ Guadamuz, *supra* note 346.

³⁴⁹ *Id.*

³⁵⁰ Mark Perry & Thomas Margoni, *From Music Tracks to Google Maps: Who Owns Computer Generated Works?*, 26 COMPUT. L. & SEC. REV. 621, 626 (2010).

³⁵¹ *WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)*, WIPO (May 21, 2020), https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1_r ev.pdf [<https://perma.cc/99PF-6YVE>].

European Parliament in its resolution on IP rights for the development of AI technologies.³⁵²

An example of what is referred to as an AI assisted creation has been discussed in *Gao Yang v. Youkou*.³⁵³ In this case, a Chinese artist equipped a hot air balloon with a camera to take photos and record a video from a high altitude of the earth's surface.³⁵⁴ Even though the images were taken by AI and the camera was not controlled by a human, the court ruled that there was clear human intervention.³⁵⁵ Without the specific selection of the camera, angles, recording mode, format and other video parameters chosen by the artist, the video would not have been able to take pictures of such quality.³⁵⁶ The court ruled that using the screenshots taken from the camera video is an infringement of the Chinese artist copyrights.³⁵⁷ Another interesting example of a work that was partially created by the application Midjourney, is the comic book "Darya of the Down."³⁵⁸ In the first instance, on September 15, 2022, the

³⁵² *Id.* at 5.; See *European Parliament Resolution of 20 October 2020 on Intellectual property rights for the development of artificial intelligence technologies*, EUROPEAN PARLIAMENT, (Oct. 20, 2020) https://www.europarl.europa.eu/doceo/document/TA-9-2020-0277_EN.html [<https://perma.cc/DR5W-DBDE>].

³⁵³ Zhou Bo, *Artificial Intelligence and Copyright Protection – Judicial Practice in Chinese Courts*, WIPO, at 4 (citing Beijing Intellectual Property Court (2017) Jing 73 Min Zhong No. 797 Civil Judgment. April 2, 2020.), https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_en.pdf. [<https://perma.cc/K3TZ-6HTY>].

³⁵⁴ *Id.*

³⁵⁵ *Id.*

³⁵⁶ *Id.*

³⁵⁷ Zhou Bo, *Artificial Intelligence and Copyright Protection-Judicial Practice in Chinese Courts*, WIPO, https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_en.pdf [<https://perma.cc/8AN8-4F5H>]

³⁵⁸ James Vincent, *The Scary Truth About AI Copyright Is Nobody Knows What Will Happen Next*, THE VERGE (Nov. 15, 2022) <https://www.theverge.com/23444685/generative-ai-copyright->

U.S. Copyright Office (USCO) issued the human author of the comic, Kristina Kashtanova, with a registration.³⁵⁹ A few months later, the USCO decided to cancel the registration. Kashtanova explained that she had been asked “to provide details of my process to show that there was substantial human involvement in the process of the creation of this graphic novel.”³⁶⁰ However, the office took the decision of granting the copyright for the story itself and for the configuration and arrangement of the images.³⁶¹

This type of case is easy to answer and enters the category of the “Exclusive Ownership” regime. The Gao Yang case for example is a typical non-autonomous first age AI capacity in which AI is used by human beings as a tool to improve their own performances and capacities. It means that each work generated partly by an AI with a clear human contribution should be copyrightable, and such copyright shall be granted to the natural person who helped by intervention to generate the artwork in question. This perception when it comes to AI assisted creation is accepted all around the world. It becomes more complicated when the case involves an AI generated invention or artwork with minimal human intervention or no intervention at all.

1. Copyright

There are two possible approaches regarding the current legal framework regarding whether work created and

infringement-legal-fair-use-training-data [https://perma.cc/3CS9-AMSE].

³⁵⁹ *Id.*

³⁶⁰ *Id.*

³⁶¹ Blake Brittain, *AI-Created Images Lose U.S. Copyrights in Test for New Technology*, REUTERS, (Feb. 23, 2023) <https://www.reuters.com/legal/ai-created-images-lose-us-copyrights-test-new-technology-2023-02-22/> [https://web.archive.org/web/20240331172225/https://www.reuters.com/legal/ai-created-images-lose-us-copyrights-test-new-technology-2023-02-22/].

generated autonomously by an AI with minimal intervention should be copyrightable.³⁶² The first approach taken by the United States, as well as the European stance, simply defines every AI creation as non-protectable by copyright because of the lack of originality and creativity or simply because the new creators are not human beings.³⁶³ Consequently, each AI-generated creation would fall directly into the public domain.³⁶⁴ The second approach tends to define such creations as protectable by copyright, but the rights shall be conferred to the programmer, or the business, that created the machine.³⁶⁵ The last option already exists in some common law countries and should be the first regime of AI ownership. The exclusive ownership regime should be internationally adopted and applies when the first and second ages of AI produce and invent new creations.

Throughout the world, Copyright Offices and case law have determined that a condition for granting IP protection is that the author must be a human being, for example the U.S. Constitution grants copyright and patent protection to the ‘author,’ even if the term ‘author’ has not been explicitly defined.³⁶⁶ However, the current legal situation in the United States is clear. In 1973, the practice of the U.S. Copyright Office (“USCO”) was clear when it established that any copyrightable work must find its origin in a “human agent.”³⁶⁷ Since then, the USCO practice has been the same, establishing that only original works, created

³⁶² Mauritz Kop, *AI & Intellectual Property: Towards an Articulated Public Domain*, 28 TEX. INTELL. PROP. L.J. 297, 303 (2020).

³⁶³ *Id.*

³⁶⁴ *Id.* at 305.

³⁶⁵ *Id.* at 304.

³⁶⁶ U.S. CONST., art. I, § 8, cl 8. (“[The Congress shall have Power . . .] To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”).

³⁶⁷ Compendium of U.S. Copyright Off. Practices § 2.8.3, at 70 (1st ed. 1973).

by a “human being,” could be registered.³⁶⁸ Still in the U.S., the position of the courts regarding non-humans as authors has remained unchanged. In *Community for Creative Non-Violence v. Reid*, the Supreme Court made clear that, “the party who actually creates the work, that is, the person who translates an idea into a fixed tangible expression entitled to copyright protection.”³⁶⁹ In *Almuhammed v. Lee*, the Ninth Circuit ruled that an author, “will likely be a person who has actually formed the picture by putting the persons in position and arranging the place where the people are to be – the man who is the effective cause of that, or the inventive or master mind who creates, or gives effect to the idea.”³⁷⁰

In Australia, declared in *Acohs Pty. Ltd. V. Ucorp Pty. Ltd.*, the court decided that a source code generated by Acoh’s program could not be protected by copyright because it was not produced by a human.³⁷¹ The Naruto case is a very popular case that can be beneficial to understanding how courts today deal with questions and concerns regarding non-human authorship and copyright protections.³⁷² The facts of the Naruto case, also known as the monkey selfie case, occurred in 2011.³⁷³ A monkey in Indonesia, named Naruto, managed to take some pictures of himself (selfies)

³⁶⁸ Compendium of U.S. Copyright Off. Practices § 313.2, at 21 (3d ed. 2017) (stating the copyright office “will not register works produced by a machine or mere mechanical process that operates randomly or automatically without any creative input or intervention from a human author.”).

³⁶⁹ *Community for Creative Non-Violence v. Reid*, 490 U.S. 730, 737 (1989).

³⁷⁰ *Almuhammed v. Lee*, 202 F.3d 1227, 1233 (9th Cir. 2000).

³⁷¹ *Acohs Pty. Ltd. v. Ucorp Pty. Ltd.* (2010) FCA 577 ¶ 66 (“Since the source code the subject of para 8(a) of Acohs’ pleading was not the work of any one human author, and was not a work of joint authorship, that code cannot be regarded as an original literary work within the meaning of the Copyright Act”).

³⁷² *Naruto v. Slater*, No. 15-cv-04324-WHO, 2016 U.S. Dist. Lexis 11041, at *3 (N.D. Ca. Jan. 28, 2016).

³⁷³ *Id.*

with the camera of photographer David Slater.³⁷⁴ The People of Ethical Treatment for Animals (PETA) argued that the photos taken by Naruto should have been protected by copyrights as he should have been granted copyrights on the pictures.³⁷⁵ PETA sued Slater for copyright infringement after Slater published an album with the selfies of Naruto.³⁷⁶ However, the U.S. Court of Appeal for the Ninth Circuit ruled that Naruto could not benefit from copyrights protection as he is not a human and therefore cannot sue for copyright infringement.³⁷⁷ This case reflects well the law's perception regarding authorship when the author is not a human.³⁷⁸

But why do courts and copyrights offices all over the world keep that sine qua non demand of authors being humans? There are two critical aspects, or aptitudes, when it comes to questioning authorship and copyright: the aspects of originality and creativity.³⁷⁹ It appears that courts, in the U.S., and almost all jurisdictions in Europe, tend to define such aptitudes as exclusively human. Originality and creativity are abilities linked with human nature.

³⁷⁴ *Id.*

³⁷⁵ *Id.* at *1–*2.

³⁷⁶ Susannah Cullinane, *Monkey does not own selfie copyright, appeals court rules*, CNN, (Apr. 24, 2018) <https://www.cnn.com/2018/04/24/us/monkey-selfie-peta-appeal/index.html> [<https://perma.cc/VMW9-KMKR>].

³⁷⁷ *Naruto v. Slater*, 888 F.3d 418, 420 (9th Cir. 2018) (“Our court’s precedent requires us to conclude that the monkey’s claim has standing under Article III of the United States Constitution. Nonetheless, we conclude that this monkey – and all animals, since they are not human – lacks statutory standing under the Copyright Act. We therefore affirm the judgment of the district court”).

³⁷⁸ *Id.*

³⁷⁹ *Feist Publ’n v Rural Tel. Serv. Co., Inc.*, 499 U.S. 340, 345 (1991) (“To qualify for copyright protection, a work must be original to the author. Original, as the term is used in copyright, means only that the work was independently created by the author and that it possesses at least some minimal degree of creativity.”).

Consequently, under this line of thinking, AI can never be an author and will never be granted copyright. If, as a condition for copyrights, a work must answer the two aspects of originality and creativity, and courts cannot accept that these aptitudes could be adapted to non-human, then the implication is AI creations cannot be protectable by copyright. Just as AI only simulates human behavior and dialogues, AI only seems to be creative.

From the following cases it can be seen how courts around the world require originality and creativity and what the sources of those aptitudes from their point of view are. In *Feist Publications Inc. v. Rural Telephone Service Co. Inc.*, the court required a copyrightable work to possess, “*The sine qua non of copyright is originality. To qualify for copyright protection, a work must be original to the author. [. . .] The minimal creative spark required in the copyright act and the constitution.*”³⁸⁰ More recently, a Federal Court ruling in the U.S. upheld the decision of the Copyright Office that refused to grant Steven Thaler a copyright for an AI generated image.³⁸¹ The Court stated that AI-generated creations lack the human creative input necessary for copyright protection which continue the same line of thoughts.³⁸²

In Europe, the Court of Justice of the European Union (CJEU) ruled that, “protected by copyright only if they are original in the sense that they are their author’s own intellectual creation.”³⁸³ In *Painer v. Standard VerlagsGmbH*, another case of the CJEU, the Court declared

³⁸⁰ *Id.* at 345, 363.

³⁸¹ Wes Davies, *AI-generated art cannot be copyrighted, rules a US federal Judge*, THE VERGE (Aug. 20, 2023) <https://www.theverge.com/2023/8/19/23838458/ai-generated-art-no-copyright-district-court> [<https://perma.cc/6HWK-Y2RJ>].

³⁸² *Id.*

³⁸³ *Infopaq Int’l. A/S v. Danske Dagblades Forening*, Case C-5/08, E.C.R. 2009 I-06569, ¶ 35 (July 16, 2009).

that “the author of a portrait photograph can stamp the work created with his personal touch.”³⁸⁴ It is critical to understand that the right of copyright in Europe is based on the author’s own intellectual creation.³⁸⁵ Only when a work is original, can the work be protected by copyright.³⁸⁶ The creative output is the author’s own creativity, and the creation is the expression of that intellectual creation, only then will the author be conferred with copyrights.³⁸⁷ In CJEU rulings, it was declared that the author must make creative choices.³⁸⁸ This way, the Court is implicitly establishing that human authorship is a *sine qua non* condition for granting IP protection.

Just as copyright acts, courts and copyright offices all over the world, as well as the Berne Convention, failed to explicitly define the term “author.”³⁸⁹ Professor Ricketson in his article of 1992, explained that, “[d]uring the early diplomatic conferences, there was very little debate about the subject, so it seems only logical to interpret “authors” and “authorship,” for purposes of the Convention, as pertaining to the persons who created such works.”³⁹⁰ It seems the reason there lacks any definition of an author is due to the logic of that time when an author could only be a

³⁸⁴ *Painer v. Standard VerlagsGmbH*, Case C-145/10, E.C.R. 2011 - 00000, ¶ 92 (Dec. 1, 2011).

³⁸⁵ Eugene Lau, *Originality in European Union Copyright Law*, 5 SOUTHAMPTON STUDENT L. REV. 46, 47 (2015).

³⁸⁶ *Id.* at 46.

³⁸⁷ Andreas Rahmatian, *Originality in UK Copyright Law: The Old “Skill and Labour” Doctrine Under Pressure*, 44 INT’L REV. INTELL. PROP. & COMPETITION L. 4, 7 (2013).

³⁸⁸ Lau, *supra* note 385, at 49.

³⁸⁹ Jane C. Ginsburg, *People Not Machines: Authorship and What It Means in the Berne Convention*, 49 INT’L REV. INTELL. PROP. & COMPETITION L. 131, 131 (2018).

³⁹⁰ Sam Ricketson, *The 1992 Horace S. Manges Lecture - People or Machines: The Bern Convention and the Changing Concept of Authorship*, 16 COLUM. -VLA J.L. & ARTS 1, 8 (1991).

human. Time changes, technology continuously develops, and the law should evolve in parallel.

On the other hand, the current law in several other jurisdictions already provides that such computer generated literary, musical, dramatic or any other artistic work is copyrightable to the extent that such copyright is granted to the creator of the program.³⁹¹ Section 9(3) of the U.K. Copyright, Designs and Patents Act stipulates that, “[i]n the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.”³⁹² Similarly, the New Zealand Copyright Act states that, “the person who creates a work shall be taken to be, - in the case of a literary, dramatic, musical, or artistic work that is computer-generated, the person by whom the arrangements necessary for the creation of the work are undertaken.”³⁹³ Copyright Acts in other countries such as India, Hong Kong or Ireland have similar sections defining an author of machine generated artwork as the person who caused the work to be created.³⁹⁴ Following this point of view, the person who created an AI system, enabling it to generate a piece of art, will be considered as the owner of the copyright.³⁹⁵

³⁹¹ Copy., Designs and Pat. Act 1988, § 9(3) (UK).

³⁹² *Id.*

³⁹³ Copy. Act 1994, § 5(2)(a) (N.Z.).

³⁹⁴ Indian Copyright Act, 1957, § 2(d)(vi) (“‘Author’ means, in relation to any literary, dramatic, musical or artistic work which is computer-generated, the person who causes the work to be created.”); Copyright Ordinance, (2007) Cap. 528, 2-24, § 11(3) (H.K.); Copyright and Related Rights (Ireland) Act 2000, pt. II, ch. 2, § 21(f) (“author” means the person who creates a work and includes ... in the case of a work which is computer-generated, the person by whom the arrangements necessary for the creation of the work are undertaken”).

³⁹⁵ Han Wang, *Authorship of Artificial Intelligence-Generated Works and Possible System Improvements in China*, 14 BEIJING L. REV. 901, 906 (2023).

It is not clear if it was the purpose of these laws when they were enacted. It is interesting, however, to note that this approach is shared mostly by common law countries.³⁹⁶ This is probably due to the importance regarding the moral rights of human authors in civil law countries such as France, Germany, or Greece, where these European countries reject this idea completely.³⁹⁷

Another country, which appears to adopt the Exclusive Ownership Regime approach, is China.³⁹⁸ In 2015, the Chinese technology company Tencent, developed an AI called “Dreamwriter.”³⁹⁹ Dreamwriter is AI based on data and able to write thousands of articles.⁴⁰⁰ In 2018, Tencent published a financial article written by AI Dreamwriter.⁴⁰¹ On the same day, the article was copied by another company, Shanghai Yingzun Co.⁴⁰² Therefore, Tencent filed a lawsuit against Shanghai Yingzun, asking for copyright.⁴⁰³ In 2019, a Chinese court, in the city of Shenzhen, held that the article is copyrightable according to the copyright act of China, arguing that the work responded to a minimal level of originality.⁴⁰⁴ Therefore, the court granted copyright to Tencent, for the article written by Dreamwriter, determining that an AI-written article

³⁹⁶ Bridy, *supra* note 347.

³⁹⁷ *Id.*

³⁹⁸ Alexander J. Wurzer, *Tencent is getting copyright for AI-dreamwriter article*, IP BUSINESS ACADEMY (Mar. 25, 2021) [https://ipbusinessacademy.org/tencent-is-getting-copyright-for-ai-dreamwriter-article#:~:text=Dreamwriter%2C%20an%20automated%20system%20developed,or%20sports%20news%20stories%20daily](https://ipbusinessacademy.org/tencent-is-getting-copyright-for-ai-dreamwriter-article#:~:text=Dreamwriter%2C%20an%20automated%20system%20developed,or%20sports%20news%20stories%20daily.). [<https://perma.cc/H9Q3-7CD2>].

³⁹⁹ *Id.*

⁴⁰⁰ *Id.*

⁴⁰¹ Bo, *supra* note 357, at 1.

⁴⁰² *Id.*

⁴⁰³ Dominic Ko, *Reprogramming Copyright Law - Comparing the Copyright Regimes in Singapore and the United Kingdom and Their Application on AI-Generated Content*, 2 COMP. L. REV. 174, 179 (2021).

⁴⁰⁴ Wang, *supra* note 395, at 904.

generated by an AI system could confer copyright protection.⁴⁰⁵ The precedent created by the Shenzhen Court shows exactly the importance of the exclusive ownership regime.

2. Patents

A patent applicant does not have to be the inventor, but the inventor must be named on a patent application.⁴⁰⁶ Like the copyright legal scope, patent inventorship legal framework in almost every jurisdiction, apart South Africa, is to be conferred to human beings only.⁴⁰⁷ Such as with copyrights, the current patent legal framework, in the U.S., grants patent rights only to human beings.⁴⁰⁸ The U.S. Patent Act refers to inventors as “individuals” or, if a joint invention, the “individuals collectively who invented or discovered the subject matter of the invention.”⁴⁰⁹ If you look at the U.S. Dictionary Act it says, “every infant member of the species homo sapiens,” which leads you to find that the term ‘individual’ clearly means humans.⁴¹⁰ It underlines that this legal perception that inventors must be humans is inked, from the beginning, into its legal definitions.

To obtain a patent, it was determined by a Court in the U.S. that, “making the invention requires conception and

⁴⁰⁵ Bo, *supra* note 357, at 2.

⁴⁰⁶ *PCT-related FAQs on the America Invents Act*, WIPO, <https://www.wipo.int/pct/en/faqs/aia.html> [<https://perma.cc/R3KX-H8PL>].

⁴⁰⁷ Jordana Goodman, *Homography of Inventorship: DABUS and Valuing Inventors*, 20 DUKE L. & TECH. REV. 1, 10 (2022).

⁴⁰⁸ Hayfa Ayoubi, *Artificial vs. Natural: Should AI Systems Be Named as Inventors on Patent Applications?*, 24 N.C. J.L. & TECH. 2, 5 (2022).

⁴⁰⁹ 35 U.S.C. § 100(f) (“The term ‘inventor’ means the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.”).

⁴¹⁰ 1 U.S.C. § 8(a); *See also* Rachel L. Schwein, *Patentability and Inventorship of AI-Generated Inventions*, 60 WASHBURN L.J. 561, 585 (2021).

reduction to practice.”⁴¹¹ The U.S. court of appeal for the Federal circuit defined conception as the, “formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention,” as it is hereafter to be applied in practice.⁴¹² In the same manner, the Federal Circuit, in *Univ of Utah v Max Planck*, declared that the conception of an invention is the formation in the mind of the invention before the reduction in practice.⁴¹³ How could an AI be recognized as an inventor, if AI, such as every computer has no “mind” (at least in the three first ages of AI) to form an idea? How could an AI carry out a mental act? Just as originality and creativity in copyright, if the aptitude required by law to be conferred patent rights protection for an invention requires a mind, then the aptitude seems to be exclusively human.

Similarly, statutory provisions and courts established in more than one case and in a more direct way the human inventor requirement. The court in *Diamond v. Chakrabarty*, declared that to be filed as a patent, an invention should be, “anything under the sun that is made by man.”⁴¹⁴ In another case, the Federal Circuit Court of Appeal referred to conception and declared that, “[t]o perform the mental act, inventors must be natural persons.”⁴¹⁵ These different

⁴¹¹ *Solvay S.A. v. Honeywell Int’l*, 742 F.3d 998, 1000 (Fed. Cir. 2014).

⁴¹² *Id.*

⁴¹³ *Univ. of Utah v. Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E.V.*, 734 F.3d 1315, 1323 (2013) (“Conception is the touchstone of inventorship, the completion of the mental part of invention. It is the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice. Conception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation. [Conception] is a mental act . . .”).

⁴¹⁴ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

⁴¹⁵ *Univ. of Utah v. Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E.V.*, 734 F.3d 1315, 1323 (2013)

court's declarations leave no doubt on the required identity of a potential named inventor. For example, corporations, although they can be the owner of a patent after being assigned by the inventor, they cannot be listed as inventors.⁴¹⁶ Consequently, if AI does not reach human aptitudes such as a mind, it will never be able to be listed as the inventor of its own creations.

Stephan Thaler created a new type of creative machine, known as the Device for the Autonomous Bootstrapping of Unified Sentience, which stands for DABUS.⁴¹⁷ DABUS is an AI system which, according to Thaler himself, can independently produce new ideas and inventions without the need for human input or any human intervention.⁴¹⁸ Thaler himself, as the legal representative of DABUS and as part of a study led by Ryan Abbott, has attempted to file patent applications in several countries, naming DABUS as the inventor in each one of them.⁴¹⁹ Thaler described its machine as the “Creativity Machine,” providing in the patent applications that DABUS creates without any human intervention or contribution.⁴²⁰ The different applications have been rejected repeatedly in almost every jurisdiction both by Courts and the Patent

⁴¹⁶ Daryl Lim, *AI & IP: Innovation & Creativity in an Age of Accelerated Change*, 52 AKRON L. REV. 813, 857–59 (2018).

⁴¹⁷ Jackie O'Brien & Isobel Taylor, *The year that was for DABUS, the world's first AI 'inventor'*, INSIDE TECH. LAW (Dec. 13, 2021) <https://www.insidetechl.com/blog/the-year-that-was-for-dabus-the-worlds-first-ai-inventor> [<https://perma.cc/L3AW-2PKY>].

⁴¹⁸ Goodman, *supra* note 407, at 11.

⁴¹⁹ *Patents, THE ARTIFICIAL INVENTOR PROJECT* (2023) <https://artificialinventor.com/patent-applications/> [<https://perma.cc/TFM2-MAWH>] (referencing Thaler has filed patent application in 18 countries: The United States, the United Kingdom, Canada, South Africa, Israel, Australia, New Zealand, Brazil, Germany, The European Union, Singapore, Taiwan, Japan, China, India, Republic of Korea, Saudi Arabia, Switzerland, and Saudi Arabia).

⁴²⁰ FlashPoint IP Ltd., Dec. Comm'r Pat., No. 16/524,350, 3–4 (Apr. 22, 2020).

Offices. In the few remaining courts, appeals are still pending.⁴²¹

The DABUS patent application was rejected, for example, in the United Kingdom by the U.K Intellectual Property Office in 2019.⁴²² The Court of Appeals for England and Wales dismissed the DABUS appeal, asking for recognition of DABUS as patent inventor.⁴²³ In the United States, the United State patent and trademark office (“USPTO”) denied the patent because AI cannot be named as inventor.⁴²⁴ The USPTO, based its decision on previous court rulings such as in *Univ. of Utah v. Max-Planck*, additionally argued that the 35 U.S.C Code §115 states that, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefore, subject to the conditions and requirements of this title,”⁴²⁵ and the legislator suggests that “[w]hoever” refers to a natural person.⁴²⁶ The USPTO then

⁴²¹ Blake Brittain, *Computer scientist makes case for AI-generated copyrights in US appeal*, REUTERS (Jan. 23, 2024) <https://www.reuters.com/legal/litigation/computer-scientist-makes-case-ai-generated-copyrights-us-appeal-2024-01-23/> [<https://web.archive.org/web/20240410162253/https://www.reuters.com/legal/litigation/computer-scientist-makes-case-ai-generated-copyrights-us-appeal-2024-01-23/>]

⁴²² U.K. Intel. Prop. Off., Decision BL O/741/19, 1 (Dec. 4, 2019)

⁴²³ *Thaler v. Comptroller-Gen. of Pat., Designs & Trademarks* [2020] EWHC (Pat) 2412, [18] (UK); See Michelle Lavrichenko, *Thaler v. Vidal: Artificial Intelligence - Can the Invented Become the Inventor*, 44 CARDOZO L. REV. 699, 711 (2022).

⁴²⁴ Jon Porter, *US Patent Office Rules that Artificial Intelligence Cannot Be a Legal Inventor*, THE VERGE, (Apr. 29, 2020), <https://www.theverge.com/2020/4/29/21241251/artificial-intelligence-inventor-united-states-patent-trademark-office-intellectual-property> [<https://perma.cc/VZ9F-HJTE>].

⁴²⁵ Complaint at 6, *Thaler v. Iancu et al.*, (E.D. Va. 2020) (No. 1:20-cv-00903).

⁴²⁶ Matthew Horton & Austin Kim, *Inventorship: why AI is not smart enough yet*, MANAGING INTELL. PROP. (June 30, 2020)

remarked that the U.S. patent act refers permanently to pronouns specific to humans such as “himself” or “herself.”⁴²⁷ According to USPTO, the 35 U.S. Code § 115, further refers clearly to humans when stating, “[a]ny person making a statement required under this section may withdraw, replace, or otherwise correct the statement at any time.” Following the decision, the District Court of Virginia affirmed the U.S. patent office rejection of DABUS, as inventor,⁴²⁸ and in August 2021, the Federal Circuit affirmed the District Court’s decision providing that, under the current legal framework, only a natural person can be listed as the inventor.⁴²⁹

In Europe, the decisions have been practically the same as on December 21st, 2021, where the legal board of appeals clarified inventorship by confirming the decision of the receiving section of the EPO, where DABUS was listed as inventor in the patent application form and decided that an inventor must be a natural person.⁴³⁰ In addition, the Federal Patent Court in Germany ruled that any AI invention is patentable, but a human must be named as the inventor.⁴³¹ However, the court declared, in a creative manner, that the

<https://www.managingip.com/article/2a5cwwad54thz0e487rpc/inventorship-why-ai-is-not-smart-enough-yet> [<https://perma.cc/9S87-553Y>].

⁴²⁷ *Id.*; 35 U.S.C. § 115

⁴²⁸ *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 245–47 (E.D. Va. 2021).

⁴²⁹ *Thaler v. Vidal*, 43 F.4th 1207, 1209 (Fed. Cir. 2022); *See also* Blake Brittain, *U.S. Appeals Court Says Artificial Intelligence Can’t Be Patent Inventor*, REUTERS (Aug. 5, 2022) <https://www.reuters.com/legal/litigation/us-appeals-court-says-artificial-intelligence-cant-be-patent-inventor-2022-08-05/>

⁴³⁰ European Patent Office, *Press Communiqué on decisions J 8/20 and J 9/20 of the Legal Board of Appeal*, EUROPEAN PATENT OFFICE (Dec. 21, 2021) <https://www.epo.org/law-practice/case-law-appeals/communications/2021/20211221.html> [<https://perma.cc/T5HT-MA9J>].

⁴³¹ Emmaline Fischer, *Patents and AI-Generated Works: Should AI Be Designated as Inventors?*, 91 U. CIN. L. REV. (Dec. 22, 2022) <https://uclawreview.org/2022/12/28/should-ai-be-designated-as-inventors/> [<https://perma.cc/X4MD-Y5MC>].

applicant could indicate that an AI machine was involved in the development or generation of the invention.⁴³²

Unlike most of the countries in the world, South Africa's patent office granted the patent for an invention conceived by DABUS, making South Africa the first country in the world to ever recognize AI as a potential patent inventor.⁴³³ Originally Australia followed South Africa's patent office decision and on July 31, 2021, a Federal Court declared that a patent could be granted even if an AI was named as the inventor.⁴³⁴ Ultimately though, this decision

⁴³² James Nurtron, *German Decision Could Provide an Answer to AI Inventorship*, IP WATCHDOG (Apr. 20, 2022) <https://ipwatchdog.com/2022/04/20/german-decision-provide-answer-ai-inventorship/id=148555/#:~:text=James%20Nurton&text=%E2%80%99CI%E2%80%99upheld%20the%20German%20decision,creative%20contribution%20of%20the%20AI.%E2%80%9D> [<https://perma.cc/P8MT-W9QE>].

⁴³³ Food Container and Devices and Methods for Attracting Enhanced Attention, S. Afr. Patent No. 2021/03242 (filed May 13, 2021) (issued June 24, 2021); see also Ed White, *DABUS around the world: AI inventorship debate far from over*, MANAGING INTELL. PROP. (Oct. 25, 2021),

<https://www.managingip.com/article/2a5d034hr8td8p19gw3y8/dabus-around-the-world-ai-inventorship-debate-far-from-over> [<https://perma.cc/V3G9-FANE>].

⁴³⁴ Josh Taylor, *I'm sorry Dave I'm afraid I invented that: Australian court finds AI systems can be recognised under patent law*, THE GUARDIAN (July 30, 2021) <https://www.theguardian.com/technology/2021/jul/30/im-sorry-dave-im-afraid-i-invented-that-australian-court-finds-ai-systems-can-be-recognised-under-patent-law#:~:text=2%20years%20old,I'm%20sorry%20Dave%20I'm%20afraid%20I%20invented%20that,b e%20recognised%20under%20patent%20law&text=An%20artificial%20intelligence%20system%20is,have%20wider%20intellectual%20property%20implications;%20https://deliverypdf.ssrn.com/delivery.php?ID=503093087027109081109074065113028007021074046013037037027007064122089090069023005094022030063118118055022124001030028101092028023061039092033029020112126103003028028050077045092027027075094120122016022107121084113110075027126111088102120005084091096020&EXT=pdf&INDEX=TRUE>

was overturned by the Full Federal Court, unanimously ruling that an AI cannot be named as an inventor in a patent application in Australia.⁴³⁵ Australia's final decision has left South Africa as the only country presently to consider AI as a potential inventor that can be listed in a patent application form.⁴³⁶

Recognizing AI as a potential inventor before reaching strong AI or AC would be wrong. DABUS is a good example of third-age AI creation. DABUS is an AI with an exceptional capacity of autonomy and creation of new content without human contribution but has not reached

[[AI as an Inventor: Has the Federal Court of Australia Erred in DABUS?, 13 J. INTEL. PROP. INFO. TECH. & ELEC. COM. L. 99, 102 \(2022\).](https://web.archive.org/web/20231214120254/https://www.theguardian.com/technology/2021/jul/30/im-sorry-dave-im-afraid-i-invented-that-australian-court-finds-ai-systems-can-be-recognised-under-patent-law#:~:text=2%20years%20old-,I%E2%80%99m%20sorry%20Dave%20I%E2%80%99m%20afraid%20I%20invented%20that,be%20recognised%20under%20patent%20law&text=An%20artificial%20intelligence%20system%20is,have%20wider%20intellectual%20property%20implications;%20https://deliverypdf.ssrn.com/delivery.php?ID=503093087027109081109074065113028007021074046013037037027007064122089090069023005094022030063118118055022124001030028101092028023061039092033029020112126103003028028050077045092027027075094120122016022107121084113110075027126111088102120005084091096020&EXT=pdf&INDEX=TRUE)

⁴³⁵ Samantha Handler, *Inventors Must Be Human, Federal Circuit Rules in Blow to AI (I)*, BLOOMBERG LAW (Aug. 5, 2022) <https://news.bloomberglaw.com/ip-law/only-humans-not-ai-qualify-as-inventors-federal-circuit-rules> [<https://perma.cc/2C2V-KCYY>]; Vito Petretti & Oliver Bell, *Australian Courts Overturn AI Inventorship Ruling*, MORGAN LEWIS (May 12, 2022), <https://www.morganlewis.com/blogs/sourcingatmorganlewis/2022/05/australian-court-overturms-ai-inventorship-ruling> [<https://perma.cc/B33Q-KM75>].

⁴³⁶ Ephraim Zachary Heiliczer, *Israel: Could the Startup Nation be the First to Allow AI Inventors?*, Pearl Cohen (June 25, 2023), <https://www.pearlcohen.com/israel-could-the-startup-nation-be-the-first-to-allow-ai-inventors/> [<https://perma.cc/64Y6-QKPY>].

human emotional and cognitive intelligence.⁴³⁷ AI should not be listed as an inventor because it has not reached the fourth age nor the human aptitudes required to form an idea in its mind, and therefore perform the mental act to create and invent.⁴³⁸

C. *Exclusive Ownership for the First and Second Ages*

Most of the jurisdictions in the world do not recognize copyright protection for works created by non-humans, and do not grant patents to non-humans.⁴³⁹ It means that according to the current legal situation including statutory, courts decisions and constitutional provisions, only works created by humans could benefit from copyright protection and only human beings could be listed as the inventor on a patent application.⁴⁴⁰ Undeniably, the legal situation concerning copyrights is divided into two different approaches.⁴⁴¹ The European and U.S approach is simply characterized by not recognizing non-human artwork at all.⁴⁴² On the other hand, the English approach is characterized by recognizing such computer-generated artistic work as copyrightable, while the copyright shall be conferred to the human responsible of that creation or in other words, to the human creator of the AI.⁴⁴³

⁴³⁷ Trevor F. Ward, *DABUS, An Artificial Intelligence Machine, Invented Something New and Useful, but the USPTO is not Buying It*, 75 MAINE L. REV. 71, 81 (2023).

⁴³⁸ *Id.* at 83.

⁴³⁹ Guadamuz, *supra* note 346; Rita Matulionyte, *AI as an Inventor: Has the Federal Court of Australia Erred in DABUS?*, 13 J. INTEL. PROP. INFO. TECH. & ELEC. COM. L. 99, 103 (Nov. 16, 2022).

⁴⁴⁰ Zurth, *supra* note 317, at 5.

⁴⁴¹ Kop, *supra* note 362, at 303.

⁴⁴² Zurth, *supra* note 317, at 4–6.

⁴⁴³ *Id.* at 5–6.

The first approach should not continue to exist, and every country in the world, including the U.S. and the European countries, should adopt either the U.K or the New Zealand acts for AI generated work with human contribution. The current legal situation in the countries in which the second approach characterizes the law symbolizes the first AI ownership regime. The IP rights conferred for AI creations should be owned exclusively by the creator of the creator. This exclusive ownership regime, in which the creator of the AI creator would have conferred IP rights for the creations, should be applied naturally to patent law. The creator of the generative AI machine has been subjected to be the programmer who may assign his rights to the company in which he works through the “work made for hire” doctrine.⁴⁴⁴ The court decision in Germany regarding DABUS is this application of that philosophy of rights.⁴⁴⁵ It could be a legitimate alternative to joint inventorship. By mentioning AI in the application as having been involved in the development of the invention, AI would be recognized for its contribution in the creation of the invention, but the ownership rights would continue to be conferred to natural persons.⁴⁴⁶ However, this alternative could only be applicable for first and second age AI creations.

The exclusive ownership regime, in terms of AI creations ownership, is no longer the only relevant ownership regime. This regime should apply to any work in which the human intervention is clear, but also to weak AI generated artwork. If AI stays in the order of weak AI fully controlled by the humans who created them, in which the human contribution is an integral part of its creation, it is simply logic to conclude that their creators should be the owner of the AI creations. It is important to note that this regime stays relevant for AI-assisted creations and AI-

⁴⁴⁴ Bridy, *supra* note 347, at 400.

⁴⁴⁵ Fischer, *supra* note 431.

⁴⁴⁶ *Id.*

generated creation with human contribution. It means that in the future, every AI generated creation or invention with human intervention or minimal human intervention, such as most of the generated artwork AI is capable of, should be exclusively owned by the human creator through traditional and conventional IP rights, such as copyright and patent systems.

To understand when exactly the exclusive ownership regime became less relevant, we look at 2017 when Facebook had to make the difficult decision to shut down one of its AI projects.⁴⁴⁷ Facebook scientists were developing robots that began to speak with each other in a language they had developed, which only the robots themselves could understand.⁴⁴⁸ It was the turning point, two robots began to communicate together in a manner where the humans who had created them could not understand their conversations. Since 2017, the AI capacity has been exponential in terms of automation, autonomy, and creativity. It is the time when humanity passed from the second age to the third age. This first regime is the only relevant regime for the long periods of the first and second ages in which AI creations were made with clear human contribution. This is the reason why this chapter addresses the limits of that first regime of ownership.

⁴⁴⁷ Tony Bradley, *Facebook AI Creates its Own Language in Creepy Preview of Our Potential Future*, FORBES (July 31, 2017), <https://www.forbes.com/sites/tonybradley/2017/07/31/facebook-ai-creates-its-own-language-in-creepy-preview-of-our-potential-future/> [https://perma.cc/2L9A-YVZV]

⁴⁴⁸ Andrew Griffin, *Facebook's artificial intelligence robots shut down after they start talking to each other in their own language*, INDEPENDENT (July 31, 2017) <https://www.independent.co.uk/life-style/facebook-artificial-intelligence-ai-chatbot-new-language-research-openai-google-a7869706.html> [https://perma.cc/YP8X-ZVG8].

V. RE-IMAGINING OWNERSHIP REGIMES

A. *Wrong Proposed Approaches*

The previous chapter determined that the creator (the company/developer) of the creator (AI) should be the owner of the traditional IP rights regarding AI first and second ages creations and inventions in which there is a clear human contribution. Technology development is critical regarding generative AI. Mankind has already entered the third age of AI, and the first AI creations with no human contribution at all can already be seen. The development of new AI techniques has permitted generative AI to be able of creative processes, independent from human interventions.⁴⁴⁹ As previously said, DABUS is a good example of such a third age AI system. It is a question of one, perhaps two years until AI reaches full automation, and all new AI creations in the future will be created independently from any human intervention at all. Such automation and autonomy will mark the third age.

The GPT program has several versions today. The released new version of GPT-4 has shown more impressive capacities, and, for example, it has successfully passed the bar exam.⁴⁵⁰ An even more exceptional fact is that GPT-4 beats 90 percent of humans taking the bar exam, and this number increases to 99 percent when GPT-4 competed against students at the biology Olympiad.⁴⁵¹ Auto-GPT of GPT-4 is a typical third-age AI reaching full autonomy on

⁴⁴⁹ White, *supra* note 433, at 12.

⁴⁵⁰ Samantha Murphy Kelly, *ChatGPT passes exams from law and business schools*, CNN (Jan. 26, 2023), <https://edition.cnn.com/2023/01/26/tech/chatgpt-passes-exams/index.html> [<https://perma.cc/X4Z8-GMSR>].

⁴⁵¹ John Koetsier, *GPT-4 Beats 90% of Lawyers Trying to Pass the Bar*, FORBES, (Mar. 14, 2023), <https://www.forbes.com/sites/johnkoetsier/2023/03/14/gpt-4-beats-90-of-lawyers-trying-to-pass-the-bar/> [<https://perma.cc/UVP5-RLQ8>].

the way to AC.⁴⁵² The capacities of AI in the third age provoke critical questions. Thaler's Machine of Creativity has also created new inventions by itself. Who should be the owner of AI creations when weak AI reaches the last level of autonomy before becoming strong? Who should own AI generated inventions with no human contribution?

Until today, machines and humans were connected, and this is the reason the rights had to be exclusive, but a division has started between them. AI has become more independent and already today, AI acts in ways that humans cannot explain.⁴⁵³ AI systems were, in fact, during the first and second ages, nothing more than a tool used by humans, to create, develop, and to improve their own creations.⁴⁵⁴ At the beginning of the third age, machine learning and other sub-techniques have helped to complete a new step. New AI systems do not need to be programmed as they are able to learn, improve, and develop alone. AI can generate new codes,⁴⁵⁵ and it, theoretically, will be able to rewrite and improve its own codes.⁴⁵⁶ The fact AI is becoming less and less dependent on humans is the main reason why humans (developers, companies, programmers) cannot continue to be the exclusive inventor or exclusive author of AI creations. Different perceptions and approaches have been proposed.

⁴⁵² Ishaan Gupta, *How To Setup Auto-GPT: The Autonomous GPT-4 AI*, MEDIUM (Apr. 24, 2023) <https://medium.com/the-generator/how-to-setup-auto-gpt-the-autonomous-gpt-4-ai-7ee6b82322ce> [<https://perma.cc/9JWW-6FVM>].

⁴⁵³ See Alan Johnson, *Tesla Loses Control and Kills Two People as Driver Claims 'Brakes Weren't Responding'*, MIRROR, (Nov 14, 2022), <https://www.mirror.co.uk/news/world-news/tesla-loses-control-kills-two-28481948> [<https://perma.cc/NQ8M-EXLU>].

⁴⁵⁴ Sun, *supra* note 45, at 1241.

⁴⁵⁵ Metz, *supra* note 33.

⁴⁵⁶ Kyle Barr, *AI 'Agents' Are Trying to Make Life a Little Easier and a Lot Weirder*, YAHOO! NEWS (Apr 26, 2023) <https://news.yahoo.com/ai-agents-trying-life-little-180000240.html> [<https://perma.cc/UF5B-4TUM>].

1. Joint Creations

This understanding has led scholars to discuss new and different approaches such as joint authorship and joint inventorship between humans and AI.⁴⁵⁷ In this way humans and machines could own the new AI creations together. If both the human and the machine have contributed to the conception of the invention, then perhaps they should be both named as joint inventors.⁴⁵⁸ This perception has been developed since human's contribution in AI creations has decreased while in parallel, AI has become more and more independent.⁴⁵⁹ Such a right shared by both humans and machines means in a normative perspective that the ownership rights are weakened and that some of those rights are transferred to a machine, passing from exclusive ownership to joint ownership. Following this perspective, humans shall no longer be the only owners of AI creations.

This approach comes with several problems. The conditions required for joint authorship of a new artistic work, is that both authors have made valuable contribution to the work and that contribution could have been independently copyrightable; it is unclear whether the AI contribution could be copyrightable.⁴⁶⁰ Humanity is only in the third age, and following the copyright scope, AI creations are still not original and creative enough.⁴⁶¹ In addition, it is important to note that granting half of the IP rights to the machine would mean that humanity has already

⁴⁵⁷ Robert Yu, *The Machine Author: What Level of Copyright Protection Is Appropriate for Fully Independent Computer-Generated Works?*, 165 U. PA. L. REV. 1245, 1260 (2017); Daniel J. Gervais, *The Machine as Author*, 105 IOWA L. REV. 2053, 2105 (2020).

⁴⁵⁸ Abbott, *supra* note 114, at 1095.

⁴⁵⁹ Zurth, *supra* note 317, at 5.

⁴⁶⁰ Russ VerSteege, *Intent, Originality, Creativity and Joint Authorship*, 68 BROOK. L. REV. 123, 153 (2002).

⁴⁶¹ Martin Senftleben & Laurens Buijtelaar, *Robot Creativity: An Incentive-Based Neighbouring Rights Approach*, SSRN 1, 23 (2020).

reached the fourth age of AI, or in other words, the Apocalyptic age of AI.

Granting half of the traditional IP rights to AI would be synonymous with recognizing the machine as having legal rights. Machines have still not reached human characteristics and aptitudes.⁴⁶² AI creations still do not fulfill the originality and creativity requirements required by law and have no mind to conceive an invention. It is important to note, for example, that the U.S law supports this argument, as for instance, a “joint work” is defined as “a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole.”⁴⁶³ It implies that the U.S law requires intentionality for recognizing joint ownership. Another human aptitude which is crucial to consider a work as joint.⁴⁶⁴ Joint authorship “seems improbable as AI possesses no potential for intentionality,”⁴⁶⁵ just as it does not possess any other human aptitude, including the ability to generate creative artistic work. In addition, weak AI, even the most autonomous, has no need to be incentivized and encouraged to create and invent and does not feel the need to be compensated for their work. As a conclusion, machines are not “ripe” to enjoy legal rights and it would be wrong to recognize them as a separate legal entity.

2. No Ownership

Another approach proposed by scholars regarding AI generated creations with no human intervention is to release such creations directly in the public domain,⁴⁶⁶ arguing it

⁴⁶² Gervais, *supra* note 457, at 2106.

⁴⁶³ 17 U.S.C. § 101.

⁴⁶⁴ GAON, *supra* note 37, at 179, 180; VerSteege, *supra* note 460, at 143.

⁴⁶⁵ GAON, *supra* note 37, at 181.

⁴⁶⁶ Sun, *supra* note 45, at 1249; Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up*, 71 TUL. L. REV. 1675, 1695 (1997).

would be for the best of the public interest.⁴⁶⁷ It would increase the public knowledge,⁴⁶⁸ and besides, machines are unable to claim the copyrights or rights over patents.⁴⁶⁹ Public domain is one of the main purposes of IP, but excessive IP protection may harm a country's economy.⁴⁷⁰ For these reasons, an appropriate balance must be found when legislators try to establish new IP rights. Releasing any AI creation to the public domain means de facto, that IP protection for new AI creations would not exist, and the consequences would be dramatic. AI is already creating and inventing and will create and invent in inestimable quantities. Consequently, the cost of creating will become so cheap that it may result in IP rights no longer being relevant in a world in which such creations are not scarce.⁴⁷¹ At the same time, the creation of the AI itself will continue to be very costly for companies.

This second approach would have catastrophic consequences on the development of new technologies by big technology companies in the future. The patent system has for purpose to disclose to the public new inventions in exchange for a protection for a limited time by incentivizing and motivating individuals to be creative.⁴⁷² As Pamela Samuelson asked,

[i]f there is no human author of such a work, how can any humans be motivated to create it? The copyright system assumes that society awards a set of exclusive rights to authors for a limited time in order to motivate

⁴⁶⁷ Sun, *supra* note 45, at 1249.

⁴⁶⁸ GAON, *supra* note 37, at 181.

⁴⁶⁹ Clifford, *supra* note 466, at 1695, 1698.

⁴⁷⁰ Kop, *supra* note 362, at 324.

⁴⁷¹ Lemley, *supra* note 277, at 505.

⁴⁷² Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1224 (1986).

them to be creative so that their creativity will add to the society's store of knowledge.⁴⁷³

According to Lawrence Becker, labor is “something unpleasant enough so that people do it only in the expectation of benefits.”⁴⁷⁴ That benefit is reflected in the property rights granted for the creation. If people believe that they deserve to be granted property right for their creations, would they continue to create if they do not get such rights?⁴⁷⁵

This is a question which underlines the instrumental interpretation of Locke's labor theory.⁴⁷⁶ According to Anna Carnochan Comer, “[t]he cycle of invention and disclosure is the essence of the patent system, and without the option to list AI as an inventor, AI owners could instead choose to keep that information private in the form of a trade secret.”⁴⁷⁷ It means that without IP protection, no matter to who they are granted, technology companies, developers, and individuals would keep their inventions as a trade secret without sharing with the public. They could even stop creating and inventing through knowing their work would be directly disclosed in the public domain. For McCutcheon, “[l]eaving works in which copyright may otherwise subsist in an authorless void leaves potentially expensive or valuable works in the public domain and it leaves investment

⁴⁷³ *Id.*

⁴⁷⁴ Lawrence C. Becker, *The Labor Theory of Property Acquisition*, 73 J. PHIL. 653, 655 (1976).

⁴⁷⁵ Lawrence C. Becker, *Deserving to Own Intellectual Property*, 68 CHI.-KENT L. REV. 609, 611 (1993).

⁴⁷⁶ GAON, *supra* note 37, at 68, 69.

⁴⁷⁷ Anna Carnochan Comer, *AI: Artificial Inventor or the Real Deal?*, 22 N.C. J.L. & TECH. 447, 479–80 (2021).

unrewarded.”⁴⁷⁸ The perpetual process of invention and disclosure is the core of IP protection.⁴⁷⁹

The argument to support this approach provides that if it is not necessary to grant IP rights to promote and encourage creativity, then the IP rights should not be granted at all.⁴⁸⁰ In this case, technology companies such as OpenAI, Meta or Google will no longer have any incentive to continue to invest huge financial resources in AI research and development if they cannot reap the fruit of their labor. When Christies sold “The portrait of Edmond de Bellamy,” generated by a GAN for \$432,000, it set a precedent that proved the huge economic potential in generative AI⁴⁸¹. Another consequence of such an approach would be a lack of transparency as people will use AI generated works and inventions for commercial purposes without declaring they were created by an AI.⁴⁸² People may even try to appropriate authorship on the AI creations by falsifying the work.⁴⁸³ The conclusion is that IP rights must always be granted to someone, even for AI creations. The question is to whom and what right should be granted?

B. Sui Generis Rights

For the reasons provided above, as the third age has already started, humans must continue to be conferred ownership rights, even for AI creations. While the world is aware that human beings are less and less involved in AI creations, humans should be granted at least some of what they contributed when they created this new creator. It

⁴⁷⁸ Jani McCutcheon, *The Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law*, 36 MELB. U. L. REV. 915, 956 (2013).

⁴⁷⁹ *Id.*

⁴⁸⁰ See Samuelson, *supra* note 472, at 1225.

⁴⁸¹ Cohn, *supra* note 30.

⁴⁸² Zurth, *supra* note 317, at 16.

⁴⁸³ GAON, *supra* note 37, at 184.

would mean that humans should get IP rights in the third age of AI through a weakened regime. This regime will last till the transition from the third age of AI to the Apocalyptic age of AI. This chapter offers to protect AI creations through a new *sui generis* system that would encourage and incentivize the human contribution to science, art, and innovation, but in parallel will continue to protect the investment of resources provided by the developers and/or the company to create the new creator. *Sui generis* rights in the scope of IP have for purpose to protect creations that should be protectable by non-traditional IP rights different from patents, copyrights, trademarks, and trade secrets.⁴⁸⁴

As previously provided, the argument that the company behind the creation of the generative AI should get full and exclusive rights stays relevant if the division between the machine and the human did not fully exist. The legal situation is more complicated as AI is not only used as a tool anymore. As the human – AI machine division increases, humanity will have no other choice than to further weaken the rights granted. Traditional legal protection is no longer relevant, and the new valuable creations generated by AI must be considered. Consequently, it is necessary to develop a new legal IP protection system. The perception that the inventor should receive weakened rights became relevant the second the human-machine division started. The development of new AI techniques has altered the ultimate contribution of humans through new AI creations as “the AI software is operating more and more independently.”⁴⁸⁵ This chapter proposes a weakened regime that would grant humans weakened rights for AI creations. Both intermediary rights proposed as alternative to patent and copyright systems will be called the “Medium-Size” ownership regime.

⁴⁸⁴ Samuelson, *supra* note 472, at 1225.

⁴⁸⁵ Zurth, *supra* note 317, at 5.

This ownership regime will be based on two domains already existing in the scope of IP rights.^{486 487} Both are options for existing doctrinal models that are applied in situations where a particular product cannot get full protection with traditional IP protection. Regarding patent rights for all inventions created by AI in the third age, the first domain is the “petty patent” or “utility model” domain (Utility Model),⁴⁸⁸ depending on where you are on the planet. Regarding Copyrights and authorship for AI artistic creations, this regime would be based on the European database directive from 11th March 1996 (“database directive”).⁴⁸⁹

1. Utility Models

The first new legal protection system to be suggested by this article to apply in the third age, regarding new AI inventions with no human input, is to be based on a non-conventional version of protection for invention. Utility models are an alternative to the traditional patent system that is no longer relevant when it comes to third age of AI inventions. The term Utility Model refers to any form of protection offered for “minor” inventions that do not meet the requirements for complete patent protection.⁴⁹⁰ Such system has for purpose, “to offer a more accessible form of patent protection for a shorter term, usually characterized by

⁴⁸⁶ *Utility Models*, WIPO https://www.wipo.int/patents/en/topics/utility_models.html [<https://perma.cc/HX2Y-HB6C>] (last visited Apr. 24, 2024).

⁴⁸⁷ Council Directive 96/9, 1996 O.J. (L 77) 20 [hereinafter DATABASE DIRECTIVE].

⁴⁸⁸ John Richards, *Petty Patent Protection*, 2 INT’L INTELL. PROP. L. & POL’Y 47-1 (1998).

⁴⁸⁹ DATABASE DIRECTIVE, *supra* note 487.

⁴⁹⁰ Richards, *supra* note 488, at 47-1.

less stringent patentability requirements.”⁴⁹¹ The Utility Model is an exclusive and territorial intellectual property right preventing others from commercial use of the invention. Today, 76 countries and regional patent offices, grant Utility Models,⁴⁹² but major countries such as the United States and the United Kingdom still do not recognize such protection.⁴⁹³ While scholars are asking if Utility Models are still relevant to this era, the approach proposed in this chapter will attempt to show how much Utility Models could be relevant in the third age of AI.⁴⁹⁴

Utility Model is a generic name given to that right.⁴⁹⁵ The Australian term is an “Innovation Patent” with a protection term of eight years. As the name indicates, the main condition required is the invention to be innovative instead of inventive.⁴⁹⁶ In other countries around the world, Utility Models are recognized under various name such as Certificate of Utility in France or Short-Term Patent in Ireland.⁴⁹⁷ Due to a lack of international harmony, the requirements for granting utility models differ from country to country.⁴⁹⁸ Usually, this right requires a lower level of inventiveness and non-obviousness than standard patent protection, if any.⁴⁹⁹ The level of usefulness and industrial

⁴⁹¹ Peter A. Cummings, *From Germany to Australia: Opportunity for a Second Tier Patent System in the United States*, 18 MICH. L. J. INT’L L. 297, 300 (2010).

⁴⁹² Daniel R. Cahoy & Lynda J. Oswald, *Is Legal Harmonization Always Better? The Counter-Case of Utility Models*, 58 AM. BUS. L.J. 525, 532 (2021).

⁴⁹³ James Nurton, *Facts and Fears about Utility Models*, 257 MANAGING INTELL. PROP. 13 (2016).

⁴⁹⁴ *Id.*

⁴⁹⁵ Cahoy & Oswald, *supra* note 492, at 532–33.

⁴⁹⁶ *Protect Your Rights with Utility Model Patents*, MANAGING INTELL. PROP. 68, 68 (2009).

⁴⁹⁷ Patrick Ravillard, *The Proposal for an EU Directive on Utility Models*, 4 INT’L INTELL. PROP. L. & POL’Y 36-1, 36-3 (2000).

⁴⁹⁸ Cummings, *supra* note 491, at 300.

⁴⁹⁹ Ravillard, *supra* note 497, at 36-1, 36-2.

applicability differs from country to country.⁵⁰⁰ There is no pre-grant examination, and the protection lasts for a period of six to fifteen years, varying from country to country.⁵⁰¹ For these reasons, a Utility Model is an easier and cheaper way to obtain protection than a standard patent,⁵⁰² and it encourages inventions and innovations in accordance with IP purposes by giving credit to the inventor for their contribution to the creation and development of new inventions.⁵⁰³ Even the type of inventions that are protectable by utility models vary from one country to another.⁵⁰⁴ For example, in Australia and France every kind of invention protectable by standard patents, can also be protected by utility models.⁵⁰⁵ On the other hand, in other countries, processes and chemical substances cannot be protected by utility models.⁵⁰⁶

The idea of Utility Models is to confer an exclusive IP right for inventions that are not patentable. There are several reasons why countries have developed this kind of protection. For example, for giving more opportunities to small- and medium-sized companies to protect their inventions or by arguing that it is wrong to let courts determine the standard level of non-obviousness required.⁵⁰⁷ Utility Models have for purpose to continue to promote and encourage people and companies to continue to create new inventions that do not comply with the parameters required for patent protection.⁵⁰⁸ By applying Utility Models to AI inventions, the system will recognize the contribution made

⁵⁰⁰ Cummings, *supra* note 491, at 301–02.

⁵⁰¹ WIPO, *supra* note 486.

⁵⁰² Mark D. Janis, *Second Tier Patent Protection*, 40 HARV. INT'L L.J. 151, 165 (1999).

⁵⁰³ WIPO, *supra* note 486.

⁵⁰⁴ Cahoy & Oswald, *supra* note 492, at 538–39.

⁵⁰⁵ *Id.*

⁵⁰⁶ WIPO, *supra* note 486.

⁵⁰⁷ Richards, *supra* note 488, at 47-4, 47-5.

⁵⁰⁸ Ravillard, *supra* note 497, at 36-2

by the company or the developer that created the AI itself. This doctrine will emphasize the need for companies to continue to invest in research and development of new technologies.

It will be based on the Utility Model system through which the creator of the creator will be conferred with a lower protection for AI inventions in the third age of AI. It would be incorrect to confer AI with standard patents or any conventional IP right, as AI has still not reached the fourth age and does not possess human traits. It is not intended to provide both human and AI joint inventorship over patents, as this would require recognizing AI as a separate legal entity with human rights. It is undesirable that in the third age, as the division between humans and machine has begun, the law will continue to grant standard patents exclusively to humans for third age AI inventions. In addition, releasing new creations automatically in the public domain would be contradictory to IP purpose, and will hurt the best incentive human laws which have been created. At the end, utility models could be the right solution by granting the creator weakened rights for AI Inventions as an alternative to traditional IP rights. Such rights will match the IP purposes by continuing to encourage and promote innovation and technology and by granting credit for the investment of energy, skills, and resources in the inventiveness process. In addition, such weakened rights grant a shorter protection than standard patents and will contribute to the increase of human knowledge.

Naturally, AI-generated inventions have different purposes and reasons to be protected than inventions that are usually filed in utility models. It is possible that regarding the new inventions, the requirements shall be updated but utility models could be at least the basis of the new regime. A form of lower protection for AI inventions would be granted to humans creating AI. One of the requirements for

granting the Utility Model to humans for AI invention must be the investment of resources.

The biggest problem of utility models today is the disharmony between the countries. If this model is to be adopted to third age AI inventions in the future, it should be recognized by TRIPS, WIPO, and other international conventions and organizations. Each country in the world should adopt such rights by enacting territorial laws that would include and recognize such a right. Such international rights would therefore establish a uniform protection for the same period and would be granted following the same conditions no matter in which country. The European commission proposed, in 1997, a directive on utility models to harmonize the laws across the European Union.⁵⁰⁹ No agreement could be found so the idea was abandoned.⁵¹⁰ However, it could be used as a basis today to create a new inventorship right for third age AI creations.

2. European Database Directive

If the Utility Model domain should be the basis of AI invention protection as an alternative to patents, the weakened rights granted to humans regarding copyrights could be pumped from the database directive. As explained earlier, the third age is an intermediary age between the second age of AI in which AI is fully controlled by humans, and the fourth age of AI in which AI has reached consciousness and is no longer under any human control. In the third age of AI, it must always be remembered that AI cannot be granted copyrights for its creations, but humans

⁵⁰⁹ Robert Hart, *European Union Initiatives on Patents and Utility Models Which Will Impact Computer Programs*, 6 INT'L INTEL. PROP. L. & POL'Y 68-1, 68-14 (2001).

⁵¹⁰ European Commission, *Utility Models*, https://single-market-economy.ec.europa.eu/industry/strategy/intellectual-property/patent-protection-eu/utility-models_en [https://perma.cc/2MPE-EJYX] (last visited Apr. 24, 2024).

also can no longer be the exclusive owner of AI creations due to the human – AI division.

As an alternative to copyrights, this chapter proposes to adopt a domain based on the database directive. The database directive was adopted on March 11th, 1996, and it provides a response to an essential economic need for database producers for obtaining protection for all the investment of time and resources realized,⁵¹¹ even if the content of that database does not respond to the originality and creativity criteria of copyrights. In fact, the database directive provides copyright protection throughout the European member states, only for the selection and the configuration of the database.⁵¹² Article 3 of the database directive provides that: “[i]n accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author’s own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection.”⁵¹³

The Article further indicates that “[t]he copyright protection of databases provided for by this Directive shall not extend to their contents and shall be without prejudice to any rights subsisting in those contents themselves.”⁵¹⁴ Providing that such protection does not apply to the contents themselves, the contents being original literary work created and already protected by copyright⁵¹⁵. The selection and configuration of such contents in an original way are protected by copyright according to article 3 of the database

⁵¹¹ W. R. Cornish, *1996 European Community Directive on Database Protection*, 21 COLLUM.-VLA J.L. & ARTS 1, 8 (1996).

⁵¹² Mark Schneider, *The European Union Database Directive*, 13 BERKELEY TECH. L.J. 551, 556 (1998)

⁵¹³ DATABASE DIRECTIVE, *supra* note 487, at art. 3(1).

⁵¹⁴ *Id.* at art. 3(2).

⁵¹⁵ Gary Scanlan, *The Database Directive - One Step Too Far*, 13 NOTTINGHAM L.J. 38, 41 (2004).

directive.⁵¹⁶ This article emphasizes the European perception of copyright requiring that a new creation must be original, and that originality will exist only when the work constitute the author's own intellectual creation.⁵¹⁷ Intellectual creation is personal to each author and therefore must be human. For non-original databases, the European countries have created an alternative right that includes de facto the sweat of the brow doctrine.⁵¹⁸ The database directive provides in Article 7 *sui generis* right protecting the database producer and provides that:

Member States shall provide for the maker of a database which shows that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents to prevent extraction and/or re-utilization of the whole or of a substantial part, evaluated qualitatively and/or quantitatively, of the contents of that database.⁵¹⁹

The process of selection, compilation, and configuration of the contents in databases are too often unoriginal and therefore unprotectable by traditional IP. As argued above, copyrights are granted only to original works with a minimum of creativity,⁵²⁰ and when such databases suffer from a lack of originality, they cannot be protected.⁵²¹ The originality must be reflected in the database through the

⁵¹⁶ *Id.*

⁵¹⁷ Andres Guadamuz, *Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works*, 2 INTELL. PROP. Q. 169, 178 (2017).

⁵¹⁸ Abraham Drassinower, *Sweat of the Brow, Creativity, and Authorship: On Originality in Canadian Copyright Law*, 1 U. OTTAWA L. & TECH. J. 105, 107 (2003–04).

⁵¹⁹ DATABASE DIRECTIVE, *supra* note 487, art. 7; Schneider, *supra* note 512, at 559.

⁵²⁰ DATABASE DIRECTIVE, *supra* note 487, art. 7.

⁵²¹ Sun, *supra* note 45, at 1237.

author's personal expression.⁵²² This *sui generis* right was created for the purpose of protecting the investment of time, energy, money, labor, and other resources and skills to produce the database,⁵²³ even when the database does not meet the requirement of originality.⁵²⁴ The protection provided to non-original database producers for their investment is for fifteen years.⁵²⁵

Copyrights are not the proper protection to be granted for non-original databases as investment of time, skills, and energy does not merit such protection,⁵²⁶ and it is legally and ethically unfounded.⁵²⁷ When the human – AI division increases, the human contribution into AI creations processes decreases. For this reason, unlike AI creations in the first and second ages, AI creations in the third age of AI do not merit copyright protection to be conferred to the human creator. The idea is to create, just like as with the databases, a weaker right that will protect the investment provided in the creation of AI by emphasizing the human contribution in these new artworks and inventions. In the third age of AI, the model of the database directive permits to provide the human creator with lower protection for AI creation that would protect the creation for a shorter period. Just as the skills, money, and other resources invested by humans to create a non-original database, the human or the company that created the AI that in turn creates new artistic work will be given a weakened protection which provides for the investment of money, time, and energy in the creation

⁵²² Cornish, *supra* note 511, at 4.

⁵²³ Amar A. Hasan, *Sweating in Europe: The European Database Directive*, 9 COMPUTER L. REV. & TECH. J. 479, 483 (2005).

⁵²⁴ P. Bernt Hugenholtz, *Implementing the European Database Directive*, 4 INT'L INTELL. PROP. L. & POL'Y 70-1, 70-7 (2000).

⁵²⁵ DATABASE DIRECTIVE, *supra* note 487, at art. 10; Hugenholtz, *supra* note 524, at 70-10.

⁵²⁶ Tee Jim Tan, *New Law for Compilations and Databases in Singapore?* 24 SING. ACAD. L.J. 745, 776 (2012).

⁵²⁷ Scanlan, *supra* note 515, at 43.

of the AI creator. There should be a prerequisite for granting such rights to the company or the developer of the AI. In the same way that a database owner must prove “substantial investment in either the obtaining verification or presentation of the contents,”⁵²⁸ the developer or the company that developed the AI must prove the same substantial investment.

The European Union understood that without legal protection, producers would lack incentive to continue to produce databases.⁵²⁹ The medium-size ownership regime must also be in accordance with the purposes of IP. By providing the human creator of AI with non-conventional weakened rights for AI creations in the third age, companies, futurists, and entrepreneurs will continue to invest time and money for research and development to improve AI capacities and other technologies. Only by providing weakened IP rights to AI’s creators, big technology companies will have the incentive to continue to create and develop AI who in turn will continue to create and invent.

From the labor theory perspective, the programmer or the company has invested time, energy, and skills to create the AI. The AI and its new creations are the fruit of the intellectual labor of the programmer.⁵³⁰ Applying a model such as the database directive or any other *sui generis* right to incentivize investment is in this perspective also fulfils the labor theory. Undeniably, this type of *sui generis* right has similarities to the “sweat of the brow” doctrine, rejected by the court in the notorious Feist case in the United States.⁵³¹ The solution could be to reintegrate the doctrine throughout the entire world to protect the investment of time, labor,

⁵²⁸ Schneider, *supra* note 512, at 558.

⁵²⁹ Miriam Bitton, *Exploring European Union Copyright Policy through the Lens of the Database Directive*, 23 BERKELEY TECH. L.J. 1411, 1426 (2008).

⁵³⁰ Sun, *supra* note 45, at 1232.

⁵³¹ Blanke, *supra* note 239, at 676.

energy, skills, and money of companies, programmers, or other individuals who have invested so resources to create generative AI.⁵³² Naturally, it would recognize the doctrine only for third age AI creations that are created without human contribution. In this way, both the labor and the investment provided by humans in such creations would be rewarded at fair value. Such right would coincide with both the normative and the instrumental interpretations of the Labor theory.⁵³³

C. *Apocalyptic Artificial Consciousness*

The obvious acceleration of technology has made it clear that AI will continue to develop remarkable abilities until it will be able to make better decisions than humans. Moore's Law⁵³⁴ and the development of technology at an exponential pace may be linked to the alarming theory of singularity,⁵³⁵ that perhaps one day the development of technology will be so rapid it will deeply impact the human civilization, consequently transforming human life forever.⁵³⁶ Marking a period in which computer intelligence will surpass and outperform the human intelligence.⁵³⁷ A theory that has parallels of the science fiction scenarios

⁵³² Hasan, *supra* note 523, at 484.

⁵³³ Hughes, *supra* note 220, at 296.

⁵³⁴ Moore, *supra* note 152.

⁵³⁵ RAY KURZWEIL, *THE SINGULARITY IS NEAR: WHEN HUMAN TRANSCEND BIOLOGY* (2006). In his book, Kurzweil defines singularity as a "future period during which the pace of a technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed." *Id.* at 7. Kurzweil argues that [a]lthough neither utopian nor dystopian, this Epoch will transform the concepts that we rely on to give meaning to our lives, from our business models to the cycles of human life, including death itself." *Id.*

⁵³⁶ *Id.*

⁵³⁷ WOOLDRIDGE, *supra* note 53, at 161, 162.

where humans lose control.⁵³⁸ Geoffrey Hinton, who is perceived as one of the pioneers of AI due to his work on neural networks, recently took the decision to quit his post at Google to send a stark warning about the danger of AI, even remarking that he regrets his work and contribution to AI.⁵³⁹ The development of GPT has brought people to understand that AI could one day, and sooner than expected, become stronger and outperform humans in every field without exceptions.

Nobody knows when it will happen and even if it will, but what is known for certain is that even reaching the third age of AI was the figment of human imagination for a long time. The transition from the second to the third age was marked by a division between the humans and the machines. The transition from the third to the fourth age of AI will be marked by the transition from weak to strong AI and from AI to AC.⁵⁴⁰ The Apocalyptic age of AI in which human intellect will become obsolete, will be characterized by a powerful AC with cognitive capacities. An AI with

⁵³⁸ Tom Bull, *Humans Risk Losing Control of Artificial Intelligence With Machines Taking Over, Scientists Fear*, DAILY STAR, (Jan. 18, 2021) <https://www.dailystar.co.uk/news/humans-risk-losing-control-artificial-23339660> [<https://perma.cc/9SZK-9MDA>].

⁵³⁹ Jennifer Korn, *AI Pioneer Quits Google to Warn About the Technology's 'Dangers'*, CNN, (May 3, 2023), <https://edition.cnn.com/2023/05/01/tech/geoffrey-hinton-leaves-google-ai-fears/index.html> [<https://perma.cc/9KVF-PT9V>]; Cade Metz, *'The Godfather of A.I.' Leaves Google and Warns of Danger Ahead*, N.Y. TIMES (May 1, 2023), <https://www.nytimes.com/2023/05/01/technology/ai-google-chatbot-engineer-quits-hinton.html> [<https://web.archive.org/web/20240416191632/https://www.nytimes.com/2023/05/01/technology/ai-google-chatbot-engineer-quits-hinton.html>].

⁵⁴⁰ Zoe Kleinman, *AI Creators Must Study Consciousness, Experts Earn*, BBC NEWS, (Apr. 27, 2023), <https://www.bbc.com/news/technology-65401783> [<https://perma.cc/N793-UP6Q>]; see also Pradeep Kumar Gautam, *Artificial Intelligence, from Narrow to Broad to Artificial Consciousness: Some Issues and Concerns*, 7 LIBERAL STUD. 87 (2022).

feelings and emotions, self-reasoning, and other human capacities, will raise an infinite number of existential, ethical, and moral concerns and issues. It may fail to materialize but if so, then it appears that AI will never be capable of being recognized as an inventor nor an author of its own creations.

There are substantial problems with granting AI IP rights. AI, at least for now, is unrecognized as a separate legal entity and has no rights granted by law.⁵⁴¹ Consequently, AI cannot sue or be sued for infringement of IP rights. AI creations are marked by a lack of originality along with creativity, and AI cannot be listed as an inventor because it has no mind or soul to perform the mental act required to invent. AI lacks the creative input necessary today to be granted creations. It will change only when it reaches such human capabilities. AI does not have the same incentives as human beings. It does not care about money, recognition, notoriety, or protection of its rights. Granting AI, IP rights will render IP purposes meaningless. AI does not care to be punished as it does not feel anything. All these reasons are justifiable if AI stays weak and does not reach human capabilities of self-reasoning, showing emotions, and the understanding of context.

In the fourth age of AI, it will become AC, and weak AI will become strong AI. The question regarding AI comprehension becomes irrelevant. AI will potentially understand and act as humans and not only simulate human behavior.⁵⁴² In the fourth age, there will not be another

⁵⁴¹ Lance Eliot, *Legal Personhood For AI Is Taking A Sneaky Path That Makes AI Law And AI Ethics Very Nervous Indeed*, FORBES (Nov. 21, 2022), <https://www.forbes.com/sites/lanceeliot/2022/11/21/legal-personhood-for-ai-is-taking-a-sneaky-path-that-makes-ai-law-and-ai-ethics-very-nervous-indeed/?sh=47c2cc1ef48a> [https://perma.cc/XJ95-YBXQ].

⁵⁴² Amir Hayeri, *Are We Ready To Face Down The Risk Of AI Singularity?*, FORBES (Nov. 10, 2023), <https://www.forbes.com/sites/forbestechcouncil/2023/11/10/are-we->

possibility but to recognize AC as a legal entity capable of creating original and creative work. AC in its best utopic version will not only reach human capabilities but will also develop emotional intelligence. In such a world, AI could be punished, could potentially perform the formation of an idea in its mind and be able to sue for infringement of its own rights. Such granting of rights to AC will also be in accordance with the purposes of IP protection as explained in chapter 2.

The relation between humans and AI based on the workmanship model, as presented in the second chapter, will be an extension of the relation between God and humans. This is the philosophical basis on which the model of granting IP rights to AC could be based. The Workmanship model is the one that will permit through this perception, to grant AC such human legal rights. Granting IP rights to an AC for the product of their intellectual labor by responding to Locke's labor theory, will be possible only then. AC will be compensated for its hard work when creating original and creative new and unique artistic work. It can finally be understood why this age will be called the Apocalyptic age of AI. These are the main reasons why AI will become at one point the exclusive owner of its own creations and inventions.

VI. CONCLUSION

AI development is rapid, extremely so. For a long period of time, AI remained science fiction. People did not believe that science fiction books and films scenarios could happen. Mary Shelley's novel, *Dr. Frankenstein* thought that by carrying out his experiments, he would help and

ready-to-face-down-the-risk-of-ai-singularity/?sh=279e816b308d
[<https://perma.cc/H7R4-353E>].

contribute to human species and society.⁵⁴³ Instead, he created a monster.⁵⁴⁴ Human beings are creating a tool too powerful for humanity that despite the good intention in such creation, will most likely outperform human beings. It is too late to stop AI advancement, but there is still time to regulate and establish new legal systems to protect human beings from AI and robotics. From AI accountability and responsibility to IP rights regarding generative AI creations, existential questions will be posed.

Throughout history, legal systems have failed to follow the revolutions' frequency. Humanity has experienced at least four revolutions while it has always taken a long time for law to align itself with changes. The convergence of computer power, big data, and the development of machine learning as a computer science field have allowed technology and AI to reach the third age. Advanced AI is reaching incredible levels of autonomy at a pace much faster than expected. Generative AI has become viral in the last months. Presently, there is a deep need to create a new legal IP framework for non-human creations. As generative AI capacity of creation with no human contribution continues to rise, this need will become deeper.

The legal systems proposed above are not the only solution, but in any way, such new legal framework must be in accordance with each one of the ages of AI and with the IP purposes. Each one of them has its own breakthroughs and characteristics. Each age has been a fundamental milestone toward the fourth age of AI. Moreover, it is critical to understand that the machine level of autonomy, capacities and understanding are the main characteristics to help regulators and legislators to establish such a new legal system. The current legal situation is unlikely to survive the

⁵⁴³ Mary Wollstonecraft Shelley, *Frankenstein; or, the Modern Prometheus* (Univ. Chi. Press 1982) (1818).

⁵⁴⁴ Comer, *supra* note 477, at 481.

AI revolution, which is why preparing the next generation of legislators with alternative models is so critical.

The current legal situation in most jurisdictions does not recognize non-human authorship and inventorship. The aptitudes required of originality and creativity regarding copyright such as the formation in the mind of the idea regarding patent are human capabilities that will likely be reached by AI only in the fourth age, if ever. Consequently, traditional IP rights would be granted to AI only in the fourth age, based on Locke's workmanship model. Exclusive ownership rights conferred to humans or companies regarding AI creations are based on the current law in England, New Zealand, India, and Ireland. Such rights will be granted only when human contribution is evident. Therefore, such exclusive rights are relevant to the first and second ages for all AI creations, but also for AI creations with human contributions and AI assisted creations in the third age.

In the third age in which humanity has already entered, AI has started to become independent and is already able to create new creations without any human contribution. This phenomenon will increase as time goes on. Therefore, it is important to establish a new law system for this age of AI regarding AI creations with no human contribution. New *sui generis* rights could be based on existing doctrines such as utility models and the database directive. In this way weakened rights would be granted to the creator of the AI through non-traditional IP rights. Such *sui generis* rights must be based on the investment of resources provided by humans in the creation of the generative AI.

There is a real need for AI regulation. As presented above, the European AI act imposing new guidelines for transparency and explainability on generative AI technologies, is on its way to becoming the first law

regulating AI.⁵⁴⁵ Governments throughout the world understand the importance of such regulation and even hundreds of AI experts, researchers and high-tech company CEOs are asking to regulate the field. The CEO of OpenAI, Sam Altman, recently asked the senate to regulate AI urgently.⁵⁴⁶ Additionally, the British prime minister's technology advisers warned that without regulation, AI will become smarter than humans. They also warned that only two years are left "to tame" AI.⁵⁴⁷ As part of regulation, it is important to establish a contemporary law system adequate to the technology and the era. Therefore, besides regulating the use of AI, establishing a new legal framework is essential, especially if AI continues to develop increasing human abilities and capabilities. The hierarchy of rights presented proposes to develop a legal IP system based on four main parameters: the level of autonomy of AI, the human contribution to the new AI creation, AI capabilities while always keeping in mind IP purposes. Based on these parameters, first and second age AI creations will be owned exclusively by humans, and fourth age AI creation will be owned exclusively by AI, effectively closing the cycle. Prior to this, third age AI creation will be owned by humans through weakened non-conventional IP rights.

⁵⁴⁵ Billy Perrigo & Anna Gordon, *E.U. Takes a Step Closer to Passing the World's Most Comprehensive AI Regulation*, *TIMES* (June 14, 2023), <https://time.com/6287136/eu-ai-regulation/> [<https://perma.cc/K6UU-XURA>].

⁵⁴⁶ Johana Bhuiyan, *OpenAI CEO Calls for Laws to Mitigate 'Risks of Increasingly Powerful' AI*, *THE GUARDIAN* (May 16, 2023), <https://www.theguardian.com/technology/2023/may/16/ceo-openai-chatgpt-ai-tech-regulations> [<https://perma.cc/CC6W-8E59>].

⁵⁴⁷ Harriet Line, *'We've Only Got Two Years to Tame AI': Rishi Sunak's Top Tech Adviser's Worrying Warning About the Dangers of Artificial Intelligence*, *DAILY MAIL* (June 6, 2023), <https://www.dailymail.co.uk/news/article-12162909/Rishi-Sunaks-tech-adviser-warns-world-got-two-years-tame-artificial-intelligence.html> [<https://perma.cc/U22E-GRVN>].

The current principal preoccupation is that there are several lawsuits against technology companies claiming for infringement of artists copyrights.⁵⁴⁸ Training AI with copyrighted works should be considered as infringement of copyright or should it be considered as fair use? Is there a difference between using it for training and using it for commercial purposes? To find answers to these questions, waiting for the ruling in each of these cases will be critical. Only then, will it be possible to create an alternative model to the current IP law to regulate this unknown world in which humans interact. It is most likely that courts will not rule against high tech companies in these cases. Any other ruling would provoke a slowdown in the development of new technologies and more particularly in AI. The progress of technology cannot be stopped, and humanity must understand it.

⁵⁴⁸ Wiggers, *supra* note 32.