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INNOVATION CHALLENGES IN THE MODERN REALM OF AI AND GROWING TECHNOLOGY: A CONTEMPLATIVE AND SWOT ANALYSIS

AUTHORS - JAIVARDHAN GOYAL & ISHIKA AGARWAL

STUDENTS AT DR. RAM MANOHAR LOHIYA NATIONAL LAW UNIVERSITY

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ABSTRACT

Recent developments in Artificial Intelligence (AI) through machines and computer applications closely mimic human intelligence via iterative processing and algorithmic machine learning. From texts, images, designs, and music to mimicking voices or deepfakes either be it prominent leaders or individuals to extract money from the family. AI replicates the styles, patterns, and themes of existing copyrighted works, raising a critical question on originality, authorship and ownership of the work thus created.

AI doesn't work independently and fed on the information through a generative tool with the given datasets, so when critically evaluated, AI is a tool that further raises the question of the ownership of the content created. These advancements while offering efficiency and creativity blur the line between legitimate inspiration and copyright infringement thus highlighting the gaps in existing trademarks and copyright law. This phenomenon of mimicking original human work or art undermines the rights of original creators and enforcement mechanisms when AI reproductions are not identical and follows a closely similar style to the original ones.

The legal, ethical, economic, and social influence due to AI's ability to generate high-quality imitations threatens to devalue human creativity, disrupt artistic industries and dilute the markets that value authentic work which is also profound. This paper aims to analyse the challenges posed by AI, and also discuss case studies of emerging technologies, underscoring the urgency to equivalate the balance between innovation and AI-generated work, ensuring that technological progress does not come at the cost of stifling human innovation, ingenuity, and legal rights.

Keywords: Artificial Intelligence, Contemplative analysis, Movable property, Intellectual property, Balance of innovation and AI generated content.

INTRODUCTION

In recent years, Artificial Intelligence or AI has emerged as a technology of great debate among scholars, academicians, researchers, technicians, philosophers, sociologists, economists, legal experts, media, regulators and policymakers across the world. The term, 'artificial intelligence' was coined as long ago as in1956 by John McCarthy[130] during the famous Dartmouth conference, that laid the foundation for further extensive and collaborative research for a long stream on this transformative technology. But, what exactly is the definition of artificial intelligence? The topic or the basic understanding of debate around AI which seems simple from the forefront isn't that

[130] Gil Press. AI Defined, Forbes. 2017

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simple but it's like an onion which unfolds itself layer by layer and to adequately understand artificial intelligence, it's better to have a grasp of what intelligence is!

Intelligence, is one of the most discussed topic in psychology, however no clear definition can be established, but in general, intelligence refers to the cognitive abilities that may enable reasoning, learning, problem-solving, and decision-making. The modern study of intelligence is often dated back to the work of Charles Spearman, who scientifically studied intelligence and proposed that it could be understood in terms of a 'general ability' that pervaded all intellectual tasks, and specific abilities that were unique to each particular intellectual task[131]. This foundational learning opened the doors for further exploration on the meaning of the world 'intelligence'. Among various theories, the most creditable and widely renowned theory remains to be "Stenberg's triarchic theory" of human intelligence, which argues that intelligence comprises three sets of skills: creative, analytical, and practical[132]. Creative intelligence is the ability to innovate, generate novel ideas and think out of the box, analytical intelligence is the ability to analyse and critically evaluate problems and solving them logically, and the practical intelligence is rather a skill to adapt to the environment around us, solve the real world problems by using creative and analytical intelligence. These provide a holistic view of what intelligence is and from the two renowned and widely acceptable definitions it can be inferred that intelligence is traditionally defined in human centric terms and attributes. Thus, building upon this, intelligence can classified broadly into two categories: natural or human intelligence and artificial intelligence.

Human intelligence is innate and biologically driven capacity to act towards emotions, think and act critically by analysing the problems and situations which a human face in a real world and the basic cognitive ability to think and act by a human is shaped by his/her societal interactions and experiences. While on the other hand, any entity, be it either machine or any other creation, that tries to mimic or copy human intelligence isn't natural but artificial in nature. Thus, artificial intelligence is the intelligence that attempts to act, think, create, reason and analyse like humans and typically is a simulation or replication of cognitive process through machines, particularly computer systems.

FOUNDATIONAL CONCEPTS

Artificial Intelligence can be divided into distinct categories based on its **capabilities** and **functionalities**, as proposed and popularized by prominent theorists like Nick Bostrom, Stuart Russell, and Peter Norvig. From a **capabilities perspective**, Nick Bostrom, a philosopher and AI theorist, in his seminal work Superintelligence: paths, Dangers, Strategies (2014) divides AI into three stages. The first is **Artificial Narrow Intelligence (ANI)**, also known as Weak AI, which is designed to perform specific task with high efficiency. ANI is widely used in our daily lives without us giving it a noticeable though where virtual assistants like Siri and Alexa, Google's Gemini or sometimes website driven AI based chatbot. **Artificial General Intelligence (AGI)** or Strong AI is the second stage representing a hypothetically capable system which may be able to reason and learn across multiple domains, performing intellectual tasks at a human level without it being reprogrammed. Although, this remains speculative but AGI is able to gather significant focus of academicians and researchers despite its theoretical nature. Finally, in **Artificial Superintelligence (ASI)** the human intellect will be surpassed in almost all the aspects from creativity and reasoning to emotional intelligence. ASI has gained attention with discussion of the technological singularity and risks that AI is likely to pose in future.

From a **functional perspective**, AI experts Stuart Russell and Peter Norvig in their influential

[131] *Spearman C. The Abilities of Man. New York, NY: Macmillan. 1927*
[132] *Sternberg RJ. Wisdom, Intelligence, and Creativity Synthesized. New York, NY: Cambridge University Press; 2003*

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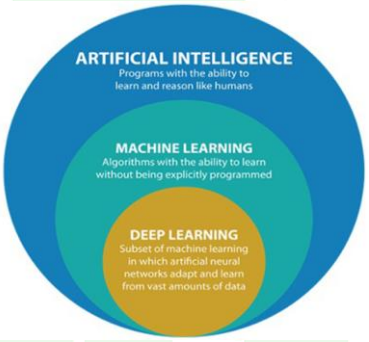
textbook Artificial Intelligence: A Modern Approach (2009) have provided a complementary classification that aligns AI systems with cognitive capabilities. The first category, **reactive machines**, such as IBM's Deep Blue, functions solely on present inputs and lacks memory or the ability to learn from past experiences. The second type, limited memory systems, such as self-driving cars, can store and use past data to improve real-time decision-making. The third type, Theory of Mind AI, is an emerging concept that seeks to understand human emotions, beliefs, and intentions, which enables advanced human-AI interactions. The final and most advanced type is self-aware AI, a theoretical construct envisioned to possess consciousness and emotional intelligence like humans, raising profound ethical and philosophical questions about machine sentience.

AI is a broad field that builds systems to replicate and emulate human intelligence and taste, and it can develop in ways to learn and make choices. Among some of the fundamental fields for AI, Machine Learning makes efforts toward building algorithms that allow these systems to learn from experiences and also get better from data patterns rather than explicit programming. Pattern recognition enables it to guess and determine outcomes, in other words, to choose options. It encompasses techniques such as supervised learning, which uses labelled data for prediction tasks; unsupervised learning, which identifies patterns in unlabelled data; and reinforcement learning, where systems learn by interacting with an environment and receiving rewards or penalties. Such methods have broad applications-from fraud detection in finance to personalized recommendations in e-commerce. For example, the Mulehunter.ai is a model developed by Reserve Bank of India to detect and identify mule accounts with an aim to encounter financial frauds.[133] Deep Learning is more specialized of Machine Learning that utilizes interspersed virtual "neurons" to learn patterns for decision-making. Data gets progressively transformed from basic pieces of information to more intricate insights through these layers to initiate understanding into the likes of pictures, speech, or text, akin to how one might imagine humans comprehend things.[134] Like for an example, Tesla's autonomous cars use deep learning through neural nets to process data from cameras, sensors, and radars to enable the autopilot feature or the self-driving mode navigating urban streets, complex intersections and freeways.[135]



CHALLENGES POSED

The evolution of AI has transformed various fields like art, literature, music and other intellectual properties but the question of originality, ownership, authorship still stands strong. This blurs the line between the human generated content and machine generated work. For instance – a song, a composition developed by AI gains mass recognition and become a viral sensation, then who deserves the royalties? Should it be the human who provided input to the software, the software or software's owners? To understand this with clarity and unravel the complexities, it's important to learn how AI, particularly Generative AI works and produces output on the given input by the user. Generative AI operates using Language Learning Models (LLMs) like GPT, which predict and generate text on the basis of vast general data and apply sophisticated methods, so that the model attempts to guess

[133] Sunaina Chadha. Explained: RBI s using an AI tool Mulehunter.ai to cut down digital frauds, Business Standard. 2024

[134] Xing Hao, Guigang Zhang, Shang Ma. Deep Learning, International Journal of Semantic Computing, Vol. X, No. III, pp. 417-439. 2016

[135] Tesla.com. Future of Driving.

the missing word. Overtime the model improves by adjusting its 'memory' stored as numbers and called parameters, until it gets better and better at predicting what comes next in a sentence. Although this invention appears to be revolutionary, it has drawbacks of its own.

One of the issue related to bias displayed by GenAI is that these systems have displayed prejudice, such as favouring men over women for job recommendations, preferring white individuals over the people of colour, and other harmful stereotypes. For example, some AI models have misidentified black individuals as guerrillas and suggested that people of colour are more likely to be sentenced and shouldn't be given easy commutation of sentence. Such biases stem from datasets used to train these models which often reflect societal prejudice, ultimately embedding human biases into AI outputs. Moreover, AI has developed the capacity to create images, videos, texts, voices etc. Deepfakes is a misuse of this developed technology used for financial frauds and misleading content, such as fabricated videos, texts and images thus blurring the line between the reality and fiction. Peeling off one more layer of the onion gives an issue of copyright infringement. The datasets used to train LLMs often include copyrighted materials harvested without proper licensing or permission. This not only raises a question of intellectual property theft but also stifles innovation among artists and other creators, as their work is now used to generate different outputs by combining them with different sources to produce something new, which seem to be original but when dig upon found out to be a copyright infringement. This has led to multiple legal battles and criticism all over the world, some of which are mentioned below.

CASE STUDIES

New York Times v OpenAI and Microsoft

The case recently brought against OpenAI by the New York Times is the latest in series of legal actions involving AI in the United States and mirrored in other countries-notably the UK. In order to train the technologies, should AI companies be allowed to use works under copyright protection without consent? The lawsuits brought by the owners of such works, including artworks in the case of image generators and journalism in the NYT case claim that this should not be allowed. Such uses, they argue, constitute copyright infringement.[136] in the ongoing legal battle, the New York Times is asking a federal judge to deny OpenAI's request to turn over reporter's notes, interview memos, and other materials used by journalists to produce stories that the media company alleges were used to help train the tech company's flagship artificial intelligence models.[137] in their petition the NYT alleges that the defendants generative artificial intelligence tools rely on large language models (LLMs) that were built by copying and using millions of Times' copyrighted news articles, in-depth investigations, opinion pieces, reviews, how-to-guides and more. While the defendants engaged in wide scale copying from many sources, they gave Times' content particular emphasis when building their LLMs, revealing a preference that recognises the values of those works. Essentially, the NYT is arguing that the defendants are using its intellectual property without paying for it and enriching themselves. The NYT links this use of its intellectual property protected work to the growth in Microsoft's valuation to a trillion dollars and OpenAI's ChatGPT valuation of $90 billion. In a bid to address the argument of "fair use" that is often a defence against copyright infringement, the NYT argued that there was nothing transformative about using NYT's content without payment to create products that substitute for the newspaper and steel audiences away from it. The core argument of the NYT is that the outputs of "Defendants' Gen AI models compete with and closely mimic the inputs used to train them" copying and NYT

[136] Mira T. Sundara Rajan. Is Generative AI Fair Use of Copyright Works? NYT v. OpenAI. Kluwer Copyright Blog, February 29, 2024.
[137] Todd Bishop. "New York Times Co. fights OpenAI's request for reporters' source materials in copyright dispute. Geek Wire, July 8, 2024.

works and hence is not fair use.[138] This case underscores the tension between IPR and the growing reliance on copyrighted material for AI development.

ANI v. OpenAI

In a recent litigation, Indian news agency ANI sued OpenAI in Delhi High Court, alleging that ChatGPT's training used copyrighted news content without authorisation. The landmark case questions AI's fair use of data, raising concerns about copyright infringement and impacting AI development in India. The key issues raised were whether the storage by the defendants of the plaintiff's data which is in the nature of news and is claimed to be protected under the Copyrights Act 1957 for training its software would amount to infringement of the plaintiff's copyright, and that the use by the defendants of the plaintiff's copyrighted data to generate responses for its users would amount to infringement of the plaintiff's copyright, and that the defendant's use of plaintiff's copyrighted data qualifies as "fair use" in terms of Section 52 of the Copyright Act 1957, and that the Courts in India have jurisdiction to entertain the present lawsuit considering that the servers of the defendants are located in the United States of America.[139] ANI contends that while some of its material may be publicly accessible, there are a few specific news items, interviews, and reports that are not made directly available to the public, and is accessible only to the subscribers. ANI claims that OpenAI has no right to use this material, as it does not have a license to copy, store or use them for training purposes.[140] The case which is ongoing in nature, has only one interim court order, whose key points include that the Court has noted objection regarding the territorial jurisdiction but has allowed the case to proceed, with the jurisdiction issue to be addressed in further hearings. The Court has also recorded that ANI had placed OpenAI's crawlers on a blocklist, ensuring that OpenAI does not have access to ANI's website. This case has the potential to set important precedents in the regulation of AI and protection of IPR in the media sector, especially in digital media. As AI technology continues to advance themselves, its likely that more legal battles will emerge demanding clarity on how content can be used, shared, and attributed in an increasingly interconnected world, with the principle of "fair use" in mind.

Thaler v. C.G. Patents

On 20 December 2023, the UK Supreme Court handed down its highly anticipated judgment in the case of Thaler v Comptroller-General of Patents, Designs and Trademarks [2023] UKSC 49, unanimously ruling that only a natural person can be named as an inventor on a patent application. In doing so, the Supreme Court upheld the decisions of the lower courts. This case concerns two patent applications filed in 2018 by Dr Thaler at the UKIPO, where he asserted that the inventions were created by an AI machine called DABUS without the involvement of a human inventor. The request for grant forms that accompanied the applications explicitly stated that Dr Thaler was not an inventor. After filing, Dr Thaler was notified that he would need to file a statement of inventorship and an indication of the derivation of his right to the grant of the patents within 16 months of the filing date of the applications under section 13(2) of the UK Patents Act 1977 (the "1977 Act") and rule 10(3) of the Patent Rules 2007. Dr Thaler responded by stating that the inventor was DABUS, acting autonomously and powered by AI, and that he acquired the right to the grant of the patents because he owned DABUS. The case then proceeded to a hearing at Dr Thaler's request, at which he argued that the information he had provided met the requirements of the 1977 Act and the Rules. On 4 December 2019, the Hearing Officer issued a decision that DABUS could not be regarded as an inventor under the 1977 Act, and further, that Dr Thaler was not entitled to apply for the patents simply because he owned

[138] Menaka Guruswamy. New York Times vs OpenAI: Is there a case for copyright?. The Indian Express, April 6, 2024.
[139] ET Legal World "ANI sues OpenAI for copyright infringement; Lawsuit could redefine AI laws in India"; Kumar Aditya; November 26, 2024.
[140] Asia Law "ANI v OpenAI: A copyright, AI training and false attribution dispute"; Vaishali Mittal; December 5, 2024.

DABUS. The decision also indicated that the applications would be deemed withdrawn at the expiry of the sixteen-month period specified by rule 10(3) of the Rules for filing the statement of inventorship.[141] Dr Thaler's appeal against the Comptroller's decision and order was dismissed in the High Court and by a majority in the Court of Appeal (as reported in last year's review). Dr Thaler then appealed to the Supreme Court. The Supreme Court unanimously dismissed the appeal. It held that the Comptroller was right to find that the applications would be taken to be withdrawn at the expiry of the sixteen-month period in rule 10(3) of the Rules. The Court emphasised that the appeal was not concerned with the broader question of whether technical advances generated by machines acting autonomously and powered by AI should be patentable. Rather, it deals with the interpretation and application of the relevant provisions of the 1977 Act. Dr Thaler had made clear that he is not an inventor; that the inventions were made by DABUS and that his right to the grant of patents for those inventions arises from his ownership of DABUS. There were three reasons for dismissing the appeal. Firstly, DABUS could not be an inventor because it was not a natural person. Secondly, Dr. Thaler had not established a right to be granted the patent since he did not request it, nor was DABUS able to transfer the rights to him. Lastly, the Deputy Director had been correct to find that the applications were deemed withdrawn under Section 13. Dr. Thaler further appealed to the Court of Appeal, but it was dismissed on September 21st, 2021 ([2021] EWCA Civ 1374, [2022] Bus LR 375). The court held by a majority (Arnold LJ and Elisabeth Laing LJ) that DABUS did not qualify as an inventor within the meaning of the 1977 Act because an inventor is required to be a person. There was no general rule of law that any intangible property (including an invention) created by a machine was the property of the machine or the owner of the machine. The Comptroller had been right to find the applications would be taken to be withdrawn because Dr. Thaler had not identified the person or persons whom he believed to be the inventor or inventors. Furthermore, he had not identified any proper basis for deriving a right to be granted the patents when he simply asserted, wrongly in law, that it was sufficient that he owned DABUS.[142] The decision of the court was primarily based upon the fact that DABUS was not a natural person; hence, he is not entitled to own any intellectual property. Keeping this as the principle, Court rejected the contention that DABUS can transfer the right it holds as it being the inventor. It is very important to understand that the main contention being made by Dr. Thaler was not to grant the patents to DABUS. Even Thaler in his arguments has made it clear that AI cannot hold any property being lacking person hood. Thaler acquired the right under the ownership of the inventor and is, therefore, the successor in the title of the inventor. Perhaps if Thaler would have not specified in his application that the inventor is DABUS, there were probable chances that he might have ended up getting the patent. Reading the arguments, the prior presumption by Thaler that DABUS is an inventor is highly misconstrued. When Thaler knows that DABUS cannot hold patents as per his contentions, his assumption that the inventor-ship can be transferred is without any base. If one cannot hold the patents, he cannot transfer. The case revolves around Section 7 and 13 of the Patents Act and Section 3.05 of the IPO's formality manual. The author feels that even if the interpretation done by the court was a bit narrow, it tried to align with that of the existing legislation but again in a manner that could be questioned. On a bare reading of Section 3.05 of the IPO formality manual, one can misunderstand it on the premise that AI inventor is not acceptable as it does not identify a person. But it has to be understood that the manual only specifies the process of how something has to be done. Interpreting 3.05

[141] Kluwer Patent Blog "The end of the road for DABUS and Dr Thaler at the UK Supreme Court"; Eden Winlow; January 16, 2024

[142]Soni's Vision "Stephen Thaler v Comptroller General of Patents, Designs and Trademarks"; February 22, 2024.

only tells us the process that AI inventor is not acceptable but it does not explicitly prohibit AI to be granted the inventor-ship. IPO made it very clear that the dismissal of Thaler's contention was not based on the premise of Section 3.05.[143]

Andersen v Stability AI and MidJourney and DeviantArt

In early 2023, visual artists Sarah Andersen, Kelly McKernan, and Karla Ortiz filed a class-action lawsuit against Stability AI, Midjourney, and DeviantArt in the Northern District of California, alleging copyright infringement, right of publicity violations, and other claims related to the use of the plaintiffs' works in training data sets for the AI image-generating platforms Stable Diffusion, the Midjourney Product, DreamStudio, and DreamUp. It was the first lawsuit of its kind, because while there had been suits brought by copyright owners against AI developers in the past, the Andersen complaint involved creators coming together to challenge the unauthorized ingestion of their works by a generative AI company. Many more lawsuits have followed, and there are now over a dozen similar class action lawsuits brought by authors and visual artists against several different AI companies.[144] The court first addressed plaintiffs' copyright claims. As a preliminary matter, the court limited the scope of the claims to a set of 16 collections of works belonging to Anderson, due to plaintiffs' failure to register with the Copyright Office any of the other works at issue. However, the court declined to dismiss the copyright allegations due to Anderson's failure to specify which works of hers were used as training images for Stable Diffusion. Instead, the court found that, at the pleadings stage, it was sufficient for Anderson to point to the results of a search for her name on haveibeentrained.com, which shows users whether their works have been included in AI training datasets. Based on the results of that search, the court found it plausible that "all of Andersen's works that were registered as collections and were online were scraped into the training datasets." The court also briefly addressed plaintiffs' claims for vicarious infringement. Because a claim for vicarious infringement requires an underlying act of direct infringement, the court dismissed with leave to amend the claims for vicarious infringement against DeviantArt and Midjourney. As for Stability, the court also dismissed the claim with leave to amend because the complaint did not offer plausible facts about the "compressed copies" of training images in Stable Diffusion and how those copies might be present in DreamStudio. However, the court noted that even if plaintiffs were able to offer plausible facts, there would still be potential defects in the vicarious infringement claim due to plaintiffs' failure to identify how defendants' AI platforms had been used in an infringing manner by third parties. The court found similar deficiencies in plaintiffs' right of publicity claims. Plaintiffs argued that their right of publicity claims were premised on defendants' use of their names to advertise and promote their respective AI platforms. However, the court found that the complaint did not offer any facts showing that any of the defendants had used any of plaintiffs' names to advertise, sell or solicit purchase of any of the AI platforms, and similarly did not offer any facts showing that using any of the plaintiffs' names as a text prompt would produce any AI-generated images that were similar enough to the plaintiffs' respective artistic styles that a person could believe that it was plaintiffs who created the image. The court dismissed these claims as well, with leave to amend.[145] What Judge Orrick is getting is that the generative AI impacts each copyright industry differently because they operate using different business models, provisions in copyright law apply to them differently, and most important, the AI models that impact them are different. As the order

[143] Mondaq "Thaler v Comptroller General of Patents, Designs and Trademarks"; Khurana and Khurana; January 7, 2021
[144] Copyright Alliance "Top takeaways from order in Andersen vs Stability AI copyright case"; Kevin Madigan; August 29, 2024.
[145] Loeb & Loeb LLP "Andersen v Stability AI Ltd."; Tal Dickstein, Edward Delman; October 30, 2023.

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points out, LLMs operate differently than image generators, and they both operate differently than music generator models. It's tempting to generalize and compare the different models and infringement cases, but each involves a unique set of facts that must be considered independently to the extent that some cases involve similar plaintiffs, defendants, and facts, those cases have been consolidated.

LEGAL FRAMEWORK: INDIA vs. EU

In the Indian Legal Framework, copyrights are governed by a legislation which is known as the Copyright Act of 1957. The Indian Penal Code of 1860 did not properly address the issues related to intellectual property rights, which added to many challenges in innovation. The Bhartiya Nyaya Sanhita of 2023 brings a more focused approach to criminalising copyright infringement, contrasting with the IPC. The IPC addressed copyright infringement primarily through sections related to cheating (Section 420) and forgery (Sections 463 to 471). These provisions could be applied to intellectual property violations but were not specifically tailored for copyright infringement, leading to enforcement ambiguities. Punishments for copyright infringement under the IPC were not clearly defined, often leading to inconsistent enforcement. The general provisions allowed for imprisonment ranging from six months to three years and fines, depending on the nature and severity of the offense. The Bharatiya Nyaya Sanhita or BNS has enhanced the definition of theft. Further punishments have been enhanced for criminal misappropriation of property, criminal breach of trust, and cheating. Under the BNS Section 314, dishonest misappropriation of property is now subject to a minimum punishment of six months' imprisonment. The offence is punishable with both imprisonment and a fine, unlike the IPC, which allowed for imprisonment or fine or both, indicating an increased emphasis on imprisonment. Sections 406 – 409 of the IPC, pertaining to criminal breach of trust, are consolidated into Section 316 of the BNS. The maximum term of imprisonment for criminal breach of trust has been increased from three years under the IPC to five years under the BNS. Sections 417, 418, and 420 of the IPC, which deal with various forms of cheating, are now unified under Section 318 of the BNS. The maximum imprisonment for cheating is increased from one year under the IPC to three years under the BNS. For the offence of "cheating with knowledge that wrongful loss may ensue to a person whose interest the offender is bound to protect," the maximum imprisonment is increased from three years under the IPC to five years under the BNS. This enhancement of penalties and stricter enforcement of law reflects that the system is now deterrent against copyright infringement violences.[146]

On the other hand, copyright laws in the EU is a bundle of national laws. Copyright has not traditionally been the centre of harmonising efforts. This is because of barriers which exist from differences in language and cultural traditions amongst the member states as well as low economic potential to exploit copyright involving literary and artistic works in trans-border transactions. The EU has embarked on issuing regulations obligating its member states to harmonise their copyright regimes. It is built on the provisions of the Berne Convention, to which all the member states of the EU are signatories. Article 2 of the Berne Convention protects literary and artistic works. These works include "every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression." This definition encompasses works such as books, lectures, musical compositions, maps, plans and paintings, to name a few examples of protected works from Art. 2(1) of the Convention. Derivative works, such as translations and other alterations of literary or artistic works, also receive copyright protection under the Convention. In recent years, the Court of Justice for the European Union (CJEU) has taken an active role in furthering the harmonization of

[146] LiveLaw "Criminal Remedies for Copyright Infringement: A Comparative Look at India's Old and New Criminal Legislations"; Lakshmidevi Somanath; July 06, 2024.

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copyright at EU level through judicial interpretation concerning a fundamental principle of copyright, the originality requirement. EU copyright law includes a host of exclusive or "economic" rights connected to copyrighted works for authors as well as neighbouring rights for those who have relationships with such works. These exclusive and neighbouring rights contain such rights as the rights of reproduction, distribution, and communication to the public, as well as the rights of rental and/or lending, broadcasting and computer program reproduction, distribution and rental on behalf of authors. Under EU copyright law, the first sale of the original or a copy of a work by the author or with his or her consent exhausts the right "to control resale of that object". In addition to this exhaustion principle developed by the CJEU in Deutsche Grammophon and later codified in Art. 4(2) of the InfoSoc Directive (the copyright directive), EU copyright law imposes other centralized limitations on copyright. Although there is no "fair-use" doctrine akin to the US copyright doctrine, EU copyright law puts specific limitations on the exclusive rights of copyright by allowing unauthorized use of copyrighted works in the public interest for the purposes listed in Art. 5 of the InfoSoc Directive of advancing science, education and culture. Examples of these limitations on copyright include, reproduction for private and non-commercial use, use for illustration for teaching or academic research, and press reviews and news reporting. Two mandatory text and data mining (TDM) exceptions to copyright protection were introduced in the Directive on Copyright in the Digital Single Market (DSM Directive) with the purpose of modernizing EU copyright law by catering more appropriately than the InfoSoc Directive to the emergence of the internet.[147]

SWOT ANALYSIS

AI is becoming a transformative force which is helping in reshaping industries worldwide. The need of the hour is to have a clear picture of this transformative force, and it is for the general mass to critically evaluate it, and how to put it to their own productive use.

As a strength, AI a powerhouse in automating repetitive and time-consuming tasks to enhance operational efficiency across industries, leading to improved productivity, reduction in human errors, and major cost savings. For example, AI-driven automation in manufacturing results in higher accuracy in output and algorithms in healthcare and education streamline administration. Moreover, it is a huge innovation driver which unlocks new capabilities in personalized medicine, autonomous automobiles, and intelligent cities. Its ability to analyse large-scale datasets allows firms to extract usable insights, ensuring better decision making and strategy building. Moreover, AI systems scale up very effectively, allowing deployment into diverse sectors like customer service through chatbots up to advanced robots in logistics operations. Another significant advantage is personalization, for which AI has allowed customization in, for instance, e-commerce recommendations, adaptive learning platforms, and entertainment content curations.

As a weakness, ethical issues like algorithmic bias and lack of transparency in the decision-making process, undermine trust and adoption. For instance, biased facial recognition systems have sparked debate on fairness and inclusivity. The heavy dependence of AI on the quality and diversity of the data used will present limitations; bad or biased data can cause faulty predictions and outcomes. One of the major obstacles is the cost of developing, deploying, and maintaining AI systems, which may be too expensive for smaller organizations. The new era of automation further threatens job security in manufacturing, logistics, and customer support areas, which leads to unemployment

[147] International Review of Intellectual Property and Competition Law "Copyright Law in the European Union, the United States and China"; Palvi Hutukka; July 12, 2023

and social inequity. In addition, AI systems are too complex, thus requiring specialized knowledge for regular updates, maintenance, and troubleshooting that can be challenging to resources.

As an opportunity, various governments worldwide have put AI to use in their day to day works. The Government of India has introduced many AI interfaces which include Aadhar Enabled Payment System, BHASHINI, and many more. The opportunity that lies here is further research and development and making the system more efficient by feeding of data and devising a specific prompt revert system. It has various applications in medicinal science, and technical engineering. There are opportunities in collaborations between AI developers and industry leaders to develop integrated systems that bring maximum utility. For instance, IoT and AI can be integrated to develop a smarter infrastructure. The development of AI in emerging markets opens opportunities to tackle local challenges through innovative, context-specific solutions.

AI also comes with threats. Absence of wide-ranging regulatory framework poses the concern of misuse and data privacy breach, as well as accountability gap. For instance, controversies relating to data harvesting and surveillance underlined the immediate need for the establishment of some ethical guidelines. Cyber security risks are still a threat for AI systems being prone to hacking, adversarial attacks, as well as breaching data where sensitive information would be compromised. This next consideration is economic inequity and how unequal accessibility to AI threatens to further push developed and less developed nations on a path where global inequality only grows. Many people fear unemployment and social rejection as a byproduct of high resistance to some automation in many industries. The final concern pertains to overreach by AI, including possible superintelligence that could be employed in warfare or surveillance, representing existential threats in need of active governance and oversight.

FUTURE TRENDS IN AI TECHNOLOGY

As we look towards the future, the importance of AI is set to grow exponentially. With AI technologies evolving at a rapid pace and their applications expanding across various sectors, AI will continue to be a critical skill for individuals, businesses, and societies.

AI and IoT integration

AI and the Internet of Things (IoT) are two intimately united concepts in several domains. IoT refers to the digital interconnection between multiple (tech) physical systems. Smart homes and smart cities are examples of IoT systems. The symbiotic relationship between AI and IoT enhances smart interactions with the physical environment by collecting different types of sensory data and processing them to make human-like decisions in such an environment autonomously.

AI in edge computing

AI often relies on remote cloud servers for its heavy lifting. This could change with edge computing. Edge AI is the practice of deploying AI models and algorithms directly on edge devices, which are devices located at the network's periphery, close to where data is generated and actions need to be taken. Recent advancements in AI, such as the development of smaller and more efficient language models like GPT-4o Mini, Llama 3.1 8B, and Gemma 2 2B, are further accelerating the adoption of edge AI.[148]

CONCLUSION

The field of artificial intelligence has made remarkable progress in the past five years and is having real-world impact on people, institutions and culture. The ability of computer programs to perform sophisticated language- and image-processing tasks, core problems that have driven the field since its birth in the

[148] Datacamp.com "The Role of AI in Technology: How Artificial Intelligence is Transforming Industries"; September 5, 2024

1950s, has advanced significantly. Although the current state of AI technology is still far short of the field's founding aspiration of recreating full human-like intelligence in machines, research and development teams are leveraging these advances and incorporating them into society-facing applications. For example, the use of AI techniques in healthcare is becoming a reality, and the brain sciences are both a beneficiary of and a contributor to AI advances. Old and new companies are investing money and attention to varying degrees to find ways to build on this progress and provide services that scale in unprecedented ways.

The field's successes have led to an inflection point: It is now urgent to think seriously about the downsides and risks that the broad application of AI is revealing. The increasing capacity to automate decisions at scale is a double-edged sword; intentional deepfakes or simply unaccountable algorithms making mission-critical recommendations can result in people being misled, discriminated against, and even physically harmed. Algorithms trained on historical data are disposed to reinforce and even exacerbate existing biases and inequalities. Whereas AI research has traditionally been the purview of computer scientists and researchers studying cognitive processes, it has become clear that all areas of human inquiry, especially the social sciences, need to be included in a broader conversation about the future of the field. Minimizing the negative impacts on society and enhancing the positive requires more than one-shot technological solutions; keeping AI on track for positive outcomes relevant to society requires ongoing engagement and continual attention.

Looking ahead, a number of important steps need to be taken. Governments play a critical role in shaping the development and application of AI, and they have been rapidly adjusting to acknowledge the importance of the technology to science, economics, and the process of governing itself. But government institutions are still behind the curve, and sustained investment of time and resources will be needed to meet the challenges posed by rapidly evolving technology. In addition to regulating the most influential aspects of AI applications on society, governments need to look ahead to ensure the creation of informed communities. Incorporating understanding of AI concepts and implications into K-12 education is an example of a needed step to help prepare the next generation to live in and contribute to an equitable AI-infused world.

The AI research community itself has a critical role to play in this regard, learning how to share important trends and findings with the public in informative and actionable ways, free of hype and clear about the dangers and unintended consequences along with the opportunities and benefits. AI researchers should also recognize that complete autonomy is not the eventual goal for AI systems. Our strength as a species comes from our ability to work together and accomplish more than any of us could alone. AI needs to be incorporated into that community-wide system, with clear lines of communication between human and automated decision-makers. At the end of the day, the success of the field will be measured by how it has empowered all people, not by how efficiently machines devalue the very people we are trying to help.