Artificial Intelligence
and
Machine Learning

Liability for trademark infringement involving artificial intelligence

Gabriele Engels, Counsel at DLA Piper, questions infringement liability for AI processes, such as grocery delivery item replacement.

In light of the UK's policy paper on AI regulation being unveiled this summer and the EU's continuing efforts to tackle the same question, it is time to examine the status quo of AI liability, especially regarding trademark infringements. This article examines the existing liability regimes as well as the case law on trademarks and analyses their suitability for AI systems. In doing so, two sources of possible trademark infringements are illustrated: AI-assisted grocery delivery services and the EUIPO's image-based trademark search tool "eSearch plus".

Gabriele Engels

"Instead of the universally applicable, risk-based approach which addresses all AIs, the policy paper suggests a sector-based approach."

What is AI?

As a uniform definition does not exist, the term "artificial intelligence" (AI) is used inconsistently to describe various applications associated with human intelligence. Generally, AI systems can be classified as such if they are "capable of learning", comparable to the problem-solving and decision-making abilities of the human mind. One of the most important capabilities of AI systems lies in the recognition and classification of patterns and rules in data sets. The characteristics of an AI application are then further defined according to (i) the functions it pursues and (ii) the environment in which it operates. Everyday examples range from facial recognition software for smartphones, over Google Maps, to the algorithms which prompt suggestions for search queries.

Legislative approaches

A decision is currently being made at the EU level as to whether the adaptation of existing liability rules is sufficient to address the newly arising challenges posed by AI or whether the introduction of an AI-specific liability regime is necessary. The proposal for a Regulation on Artificial Intelligence contains a broad definition of AI as a software-based technology that generates an output based on interactions with its environment. This AI Regulation then distinguishes between four risk categories: Unacceptable, high, low, and minimal risk. Low and minimal risk AIs, such as chatbots or spam filters respectively, are not subject to any special obligations and must only comply with transparency requirements. By contrast, systems with an unacceptable risk (often deployed in scenarios in which fundamental rights are significantly affected, e.g. facial recognition programs that use real-time biometric data for law enforcement purposes) are prohibited entirely. The focal point of the Regulation, however, lies on so-called high-risk AI systems, which must meet strict requirements. Examples include security components contained inside other products (e.g. drones).

This purely risk-based approach, which operates independently from fault, automatically triggers the obligation to comply with specific requirements aimed at preventing rights violations when operating AI systems or placing them on the market. However, the AI Regulation does not address particularly relevant questions surrounding intellectual property rights and liability, especially where an AI is the actual perpetrator of such infringements. These include evidentiary issues such as proving the existence of a defect in intangible products, as well as a causal link between such a defect and a harmful outcome. Similar difficulties arise around the identification of the potentially liable party and proving fault.

'Country needs power of AI to be global power'

JAMES EDWIN

HANS EXCLUSIVE

Director of Leadingindia.ai, Prof Deepak Garg

Artificial intelligence and deep learning skilling and research initiative approved by Royal Academy of Engineering, UK under Newton Bhabha Fund and collaborated by University College, London, Brunel University, London, and Bennett University plans to skill one million students in two years and to set up 100 quality research groups under 100 zonal lead colleges

Warangal: The power of artificial intelligence (AI) is more decisive than nuclear power for the nations in future, in terms of being a global power, felt Prof Deepak Garg, the Director of Leadingindia.ai.

Leadingindia.ai is a nationwide initiative on 'AI and deep learning skilling and research', approved by Royal Academy of Engineering, UK under Newton Bhabha Fund and collaborated by University College, London, Brunel University, London and Bennett University, India.

Garg is in Warangal to speak at the three-day workshop on AI and deep learning at SR Engineering College, the institutional collaborators in Telangana. He shared his views with The Hans India and explained AI's significance and what needed to be done for India to emerge as a global power and compete with world nations.

India is progressing in AI, but in comparison to the US, China and Canada, investments are low. More investments by government and private sectors, upgraded efforts needed to take place India in comity of nations powered by AI. Developed nations already started integrated AI into their defence projects and we just started thinking about it, he said.

Speedy efforts to match up with those challenges, to imbibe AI skills and research in youngsters are the need of the hour. It is touching every paradigm of life impacting education, agriculture and healthcare, the key sectors of economy, Garg explained.

After learning AI's importance, AICTE has recently introduced it in its curriculum. But there is a need of quality teachers. "Leadingindia.ai initiative is timely in that manner. Enthusiasm and interest specifically learning potential and motivation from institutes in tier-II cities is very encouraging". Universities in India have to upgrade their curriculum and it has to be done as fast as possible or they will be left behind. Leadingindia.ai with quality skills workshops for teachers, plans to skill one million students in two years and to set up 100 quality research groups under 100 zonal lead colleges. 'Universities and institutes attached with us trying to create specific research groups in healthcare, cyber security, agriculture, banking, finance and insurance and we hope to come up with a very good products out of these research groups in two years' timeline,' Garg said. Institutions are being integrated with startup companies, bringing big names in the industry like Microsoft, Google, Amazon and Nvidia onboard. 'Process is already on to change the AI landscape in India', he averred.

Artificial intelligence can revolutionise education

The role of technology is becoming more and more central to our educational infrastructure, with AI-powered systems transforming the way we teach and learn. This is the age of the hi-tech classroom.

MEENAL ARORA

Since the inception of the institution of education, the methods of teaching and the bond shared between learners and educators have evolved significantly. Teaching methods across the globe have become more structured to give better, more streamlined results. This transformation can be majorly attributed to the ongoing intervention of technology.

On the back of continuous technological advancement, we are witnessing a paradigm shift in the teaching-learning process. The relationship between educators and students is changing, where educators have become more approachable and much better at understanding their students' perspectives. Technology has made learning more collaborative, as teachers and students are working in tandem to achieve better outcomes.

This is shrinking the age-old accessibility gap and enabling tailor-made learning experiences for different learners with varied needs. Artificial intelligence (AI), among many technological applications, has a big role in changing old trends in education space. Let us see how.

Use in administrative tasks

AI, by definition, focuses on machines that are designed to be intelligent enough to work and react like humans. AI has automated drab administrative tasks and cut down on the time and effort teachers used to put in things like assessing students' work and grading exams. Though earlier AI-led test grading was limited to only objective-type answers, newer AI systems are being designed to assess subjective answers as well.

With this, teachers can now direct their energies towards engaging with their students and dealing with challenges that they are facing. AI is also helping school admission through virtual conferencing, lectures etc.

For quality education

In an age when technology is shrinking the world, it is also making quality education more accessible to a larger population in the form of smart content. With advanced applications of AI, educators are setting content as per the local needs of the students in different parts of the country. They often offer education through virtual learning.

Even the textbooks have transformed as AI systems are now being used to create digital textbooks for specific topics/subjects. This is helping to engage students of all academic grades and ages. Many educational platforms use AI to enable professors to create electronic curriculums and simplify textbook content through various tools.

Tailoring education

Each student possesses different learning abilities and pace of absorption. Who would have imagined that in a class full of students, teachers could fully identify each one's strengths and weaknesses and work on them individually. Now, with the help of AI, they put in place systems that work according to the needs of the students.

If a student faces challenges with a particular topic, the system identifies the areas that need to be focused upon. Then, using predictive analysis, it provides help as and when needed. This helps students work at their own pace and brings out the best in them.

Identifies improvement

It is not uncommon for students to grapple with particularly challenging concepts in their curricula. This is where educators step in to ensure that students' understanding is not limited. But sometimes even the best of teachers might leave a gap in explaining a concept, which could leave students with half-baked knowledge. AI, on multiple online course platforms, is solving this problem. Adopting a utilitarian approach, it analyses the most prevalent trend among students. If the trend is deviating from the intended goal, AI alerts educators and directs students towards the correct answer.

This way it facilitates educators in building a stronger conceptual foundation for all students alike. It helps students with immediate feedback and stops them in their tracks if they are straying and improves their understanding of the subject.

Universal access

AI-powered learning system makes classrooms accessible to all, including those in another country. This can be highly helpful to those students who are unable to attend school due to an illness or want to study a different course from the one available in their school.

School education in India has seen substantial progress in recent decades, with efforts at both the Central and State levels. Substantive gains in enrolment have been achieved—Gross Enrolment Ratio (GER) is 97% at elementary level and 80% at secondary level, as per recent figures. Although the path is long and full of obstacles, the education pioneers of the country have vowed to take the national education system on a par with the global level.

The role of AI is significantly increasing and creating adaptive teaching-learning techniques. A study states that by 2021, the application of AI in education and learning will increase by 47.5%. Beyond academics, it can also streamline students' career choices.

As the development of new applications of AI is underway, the education industry is gearing up to be a part of the revolution. With its distinct benefits, AI's presence is ever swelling and in spite of its anticipated significance in the education space, it might surprise us with even greater value in time to come.

The author is founder director, Shemford & Shemrock Group of Schools

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Artificial Intelligence

Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind

Artificial Intelligence

- It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.

  - John McCarthy (Stanford professor), 2004

    jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html

Artificial Intelligence

- Alan Turing (father of computer science)
  - Computing Machinery and Intelligence
    - "Computing Machinery and Intelligence" is a seminal paper written by Alan Turing on the topic of artificial intelligence. The paper, published in 1950 in Mind, was the first to introduce his concept of what is now known as the Turing test to the general public.

      https://en.wikipedia.org/wiki/Turing_test

- The idea of artificial intelligence has been around since 1941

Artificial Intelligence

Turing test:

A test of a machine's ability to exhibit intelligent behavior equivalent to, or indistinguishable from, that of a human. Turing proposed that a human evaluator would judge natural language conversations between a human and a machine designed to generate human-like responses. The evaluator would be aware that one of the two partners in conversation was a machine, and all participants would be separated from one another. The conversation would be limited to a text-only channel, such as a computer keyboard and screen, so the result would not depend on the machine's ability to render words as speech. If the evaluator could not reliably tell the machine from the human, the machine would be said to have passed the test.

Artificial Intelligence

- Four potential goals or definitions of AI, which differentiates computer systems on the basis of rationality and thinking vs. acting:

  - Human approach:

    - Systems that think like humans
    - Systems that act like humans

  - Ideal approach:

    - Systems that think rationally
    - Systems that act rationally

- Alan Turing's definition would have fallen under the category of "systems that act like humans."

Artificial Intelligence

- Types of artificial intelligence—weak AI vs. strong AI
  - Weak AI—also called Narrow AI or Artificial Narrow Intelligence (ANI)
    - AI trained and focused to perform specific tasks
    - Weak AI drives most of the AI that surrounds us today
      - Apple's Siri
      - Amazon's Alexa
      - IBM Watson
      - Microsoft's Cortana
      - Google Assistant
      - Samsung's Bixby
      - Autonomous vehicles

Narrow might be a more accurate descriptor for this type of AI as it is anything but weak

Artificial Intelligence

- Strong AI is made up of Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI)
  - Artificial general intelligence (AGI), or general AI, is a theoretical form of AI
  - A machine would have an intelligence equal to humans
    - Self-aware consciousness
    - Ability to solve problems
    - Ability to learn
    - Ability to plan for the future

Artificial Intelligence

- Artificial Super Intelligence (ASI)—also known as superintelligence—would surpass the intelligence and ability of the human brain. While strong AI is still entirely theoretical with no practical examples in use today, that doesn't mean AI researchers aren't also exploring its development. In the meantime, the best examples of ASI might be from science fiction, such as HAL, the superhuman, rogue computer assistant in 2001: A Space Odyssey.

Machine Learning

- Machine learning is a sub-field of AI
- Consists of deep learning vs. machine learning
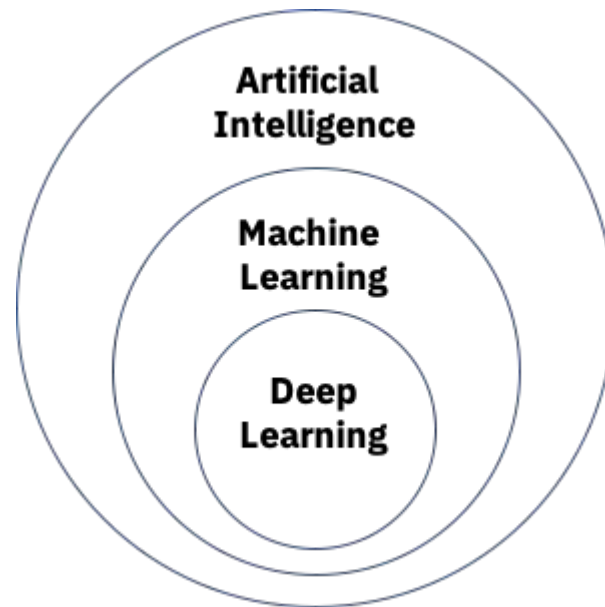
Machine Learning

- Classical, or "non-deep", machine learning is more dependent on human intervention to learn

- Human experts determine the hierarchy of features to understand the differences between data inputs, usually requiring more structured data to learn.

Machine Learning

- Deep learning is actually comprised of neural networks

- "Deep" in deep learning refers to a neural network comprised of more than three layers—which would be inclusive of the inputs and the output—can be considered a deep learning algorithm

Artificial Intelligence

- There are numerous, real-world applications of AI systems today. Below are some of the most common examples:

  - Speech recognition
    - Also known as automatic speech recognition (ASR), computer speech recognition, or speech-to-text
  - Customer service
    - Online virtual agents replacing human agents
  - Computer vision
    - Enables computers and systems to derive meaningful information from digital images, videos and other visual inputs

Artificial Intelligence

- Recommendation engines
  - Using past consumption behavior data, AI algorithms can help to discover data trends that can be used to develop more effective cross-selling strategies. This is used to make relevant add-on recommendations to customers during the checkout process for online retailers.

- Automated stock trading
  - Designed to optimize stock portfolios, AI-driven high-frequency trading platforms make thousands or even millions of trades per day without human intervention.

Artificial Intelligence

- Future applications
    - Medical assistants
    - Psychological evaluations
    - Companion automatons

Artificial Intelligence

Large Language Models (LLMs)

A large language model is a language model notable for its ability to achieve general-purpose language generation. LLMs acquire these abilities by learning statistical relationships from text documents during a computationally intensive self-supervised and semi-supervised training process. LLMs are artificial neural networks typically built with a transformer-based architecture.

There is a new terminology associated with LLMs. We no longer say input/output.

We now say:

Prompt

Completion

Artificial Intelligence

Examples of LLMs:

- Google's Bard and LaMDA
- IBM's Watsonx
- Meta's LlaMA
- Quora's QPG
- OpenAI's GPT LLMs
- Nvidia's RTX chips

Which leads us to what Apple is doing with AI ...

Apple and AI

NOTHING

Well that's not quite fair …

As of March 27th Apple had not yet announced an AI offering.

However, according to the MacRumors website Apple has a ChatGPT-like offering in the works called (so far) Ajax. That may or may not be the name of the "Apple Chat" product when it is finally released to the public.

So stay tuned!

Artificial Intelligence

ChatGPT

- What is it?
- What are the issues surrounding it

ChatGPT

A product of OpenAI, a company founded in 2015 by a group of investors that included Elon Musk

OpenAI conducts AI research with the declared intention of promoting and developing a friendly AI

OpenAI systems run on the fifth most powerful supercomputer in the world

It is a type of "deep" learning called a Large Language Model

ChatGPT

GPT- What is it?

GPT stands for Generative Pre-trained Transformer

It is a large-scale unsupervised language model developed by OpenAI that is capable of generating human-like text.

en.wikipedia.org/wiki/Generative_pre-trained_transformer

ChatGPT

OpenAI created a GPT AI engine that is now in its 4th generation - therefore known as GPT-4

GPT-4 has a web and API interface into it to allow user and program access to GPT-4 facilities

GPT-4 has many AI facilities available, like one to convert programming code from one programming language to another

The most well known facility and the one of most interest to us is the chat facility

ChatGPT

The primary web interface to GPT-4 ("playground") gives access to all the facilities.

So if one wants to chat one must select the chat function from a drop-down list of available functions while in playground.

When OpenAI decided to open up GPT to the world they created a new web interface that went straight to the chat function and called it: ChatGPT

Released November 2022

ChatGPT

ChatGPT has been free but may not be available much longer

Openai and Microsoft have a contract to merge GPT with Microsoft's search engine Bing – now called Copilot

Currently the new Bing with GPT is built in to the Edge browser and can be accessed from other web browsers by going to bing.com

However, the chat function will likely still be available from OpenAI through their "playground" interface

Dall-E

One additional product from OpenAI is the Dall-E graphic generation and editing interface

It is capable of producing some pretty amazing art work from text input

Dall-E can be accessed from the Edge browser by clicking the Image Creator button. From other browsers by going to openai.com/product/dall-e-2

ChatGPT

ChatGPT issues

- GPT very often returns wrong information (one writer called this tendency "hallucinations")

  - Estimates are as high as 40% of completions

  - One writer asked GPT-4's predecessor GPT-3 to write an article about that year's superbowl game. GPT-3 returned an article about the previous year's.

  - A major problem is that GPT-4 has no current event data past 2022

ChatGPT

But there is an even bigger issue:

- Writers for newspapers and magazines are using GPT to do their writing for them

- College students are using GPT to write term papers and theses for them

- Very likely school children are using GPT to complete schoolwork assignments

One has to question whether there is any real learning going on

ChatGPT

- There was a story recently about pastors using ChatGPT to write their sermons

- With GPT's ability to write computer code there may be fewer jobs in the IT field, especially in computer programming jobs

- CNBC ran an article about Alejandro Lopez-Lira, a finance professor at the University of Florida, who says that large language models (like GPT) may be useful when forecasting stock prices

- Insider web magazine recently ran an article about GPT-4 passing the US medical licensing exam with flying colors

ChatGPT

- A law technology company recently identified three areas where large language models (like GPT) can have repercussions for areas of law:

    - AI can supply new tools that can listen to a spoken sentence and then generate that voice into any conversation – thus making recordings difficult to verify

    - ChatGPT can create text that "sounds good" but has no basis in reality. The problem they highlighted with this is folks who are considering legal action search on legal questions and getting bad advice, that they believe, that would encourage them to take (or not take) legal actions (remember – GPT is wrong 40% of the time – it hallucinates)

ChatGPT

- Another problem area they identified is lawyers themselves. If they use GPT for legal citations there is a good chance they will be wrong.

  - GPT was asked for citations on a very specific question and got a three or four paragraph answer that looked brilliant. Unfortunately, the first paragraph stated the law incorrectly, and the second paragraph cited a case it said was the best precedent, and the case it cited was totally made up, along with the case number and page number it was supposed to be in.

- Finally, AI can be used to alter images. It has the ability to take a couple of photos of an individual and from them impose that individual into any other photo and have the authenticity of that photo be very difficult to verify. This will make photographic evidence become suspect.

ChatGPT

Cohen used AI to create fake cases he cited for judge

Michael D. Cohen, a former fixer for former President Donald Trump, said in a new court filing that he unknowingly gave his attorney bogus case citations after using artificial intelligence to create them as part of a legal bid to end his probation on tax evasion and campaign finance violation charges.

According to the filing unsealed Friday, Cohen said he used Google Bard, an AI chatbot, to generate case citations that his lawyer could use to assist in making the case to shorten his supervised release.

Cohen gave those citations to one of his attorneys, David M. Schwartz, who then used them in a motion filed with a U.S. federal judge on Cohen's behalf, the filing said.

ChatGPT

There are further complications with ChatGPT (and other LLMs)

- Training an LLM requires inputting massive amounts of textual data – much of which is copyrighted material

  - The courts are still wrestling with whether this is copyright infringment
- The completions from LLM's are based on copyrighted source materials – who owns the copyrights to the completions

ChatGPT

Solutions to the dilemma

- ChatGPT may not be available much longer.
  However, the new Bing/Copilot will still do the same thing. And if the writers and students know how to access the "playground" feature this may not be enough

- In January of 2023 a college student developed a ChatGPT detection tool called GPTzero

- OpenAI announced in February of 2023 they are developing ChatGPT detection tools as well

Additional AI Applications

Recently the Recording Academy, the organization behind the Grammys, added a new rule to limit nominations for a Grammy. AI generated songs have become ubiquitous enough in the recording industry that the Recording Academy decided to promulgate a rule barring AI generated music from being nominated unless there is evidence a human was involved in at least part of the generation of the music.

Watch out – that next song you can't get out of your head may be AI generated

Nvidia and the GPU

GPU = Graphics Processing Unit

More powerful than the CPU in your computer

   (and more expensive)

Nvidia is the largest manufacturer of GPU's

Favored by AI developers as the platform of choice for AI applications

Since the announcement of ChatGPT in November 2022 and the race was on to develop more powerful AI applications Nvidia stock has seen an 1800% increase