Issues of Plagiarism and Moral Right to Attribution When Using Work Created by Large Language Models

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The advent of large language models such as ChatGPT has led people to use text responses generated by large language models (LLMs) in their research publications. This paper explores the issues arising from such use, including - originality of ideas and work, originality of text generated by LLMs, and plagiarism and moral right to attribution when work created by LLMs is used by authors. The paper proposes a plagiarism policy for using text generated by LLMs. Broadly, the policy proposes the following. If a work copies the response of LLMs, the use of LLM should be acknowledged, and the text should be presented in quotations. The original source of the information must be searched and acknowledged. If the work paraphrases the response of LLM, the use of LLM should be acknowledged. The original source of the information must be searched and acknowledged. If the work resulted from ideas generated during interaction with LLM, the use of LLM should be acknowledged for the help in generating the idea.

Keywords: Large language Models, Chatgpt, Copyright, Plagiarism, Right to Attribution, Moral Rights

Is there nothing new under the Sun?[1] When is an idea original?[2] It would be wrong to say there is nothing new under the Sun. Every day, creators of work push the boundaries of existing knowledge by creating work that is different from existing work. Sometimes, the work connects existing ideas to say something that hasn't been said before. Sometimes, the work created says something fresh, new, and unthought. However, other times, work is often a rephrasing of existing ideas. There may also be situations where the language of existing work is copied to different extents. In these various situations, the answer to whether the idea is original and whether the work is original needs attention. While the work would be original when it says something new that has not been said before, it would be unoriginal if it merely rephrases existing ideas or copies other works.

There are two perspectives about whether an idea is original - the process of creating an idea being original or the result of process being original.[3] Does originality in an idea come from the process of creation being original?[4] Or is originality in an idea to be inferred from the product of creation looking original? There are problems attached to each of these perspectives. On the one hand, if originality is just based on how the product of creation looks, ideas that

weren't created originally by a person may pass off as their idea. On the other hand, if originality is judged based on the process of creation alone, the work is likely to be considered original when it does not state new ideas. Therefore, originality needs to be judged by looking both at the process of creation and the product of creation. Was the work created by the person, and does the work state a new idea? It is important to explore both these conditions - work originating from the person and originality of the idea.

How do individuals create work? Work is, of course, not created in a vacuum. Individuals base their work on previous work. The process of creation often involves saying something based on existing ideas. What if someone says something based on existing ideas to merely state the exiting knowledge? The person could probably not directly have copied the idea from an existing work but could have come up with the work because their mind was previously exposed to an idea that they have internalised.[5] In such situations, although the process of creation was original, but the resulting work is not an original idea.

There is also a need to distinguish between originality of work and originality of idea. There is also a need to look at the role of language. A work may be expressed in a language that has not been used before but could essentially state existing ideas. The idea may not be original here, although the language

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is original. On the other hand, a work may copy several ideas yet synthesise them to draw connections that have not been drawn before. Copying of ideas and language can happen to different extents. If the language is copied verbatim, yet the synthesis of ideas leads to a new idea, the idea may be original, yet the language may be unoriginal.[6]

Therefore, does the originality of work lie in using a sequence of words that haven't been used before, or does originality lie in making sense of something in a way that hasn't been understood before? When should a work be considered original - originality of idea or originality of language? If the originality of the idea is the criterion, then the issues surrounding the copying of language must be addressed. If originality of language is the criteria, work paraphrasing existing ideas would pass through only because the sequence of words has not been used before. Therefore, the originality of the work must be judged by looking at whether there is an original idea and whether the issues surrounding the verbatim copying of language from other sources are addressed. These issues include seeking copyright permissions and acknowledging the source of past ideas.

The above discussion on the originality of work, ideas, and language has become very relevant today, where large language models such as ChatGPT are being used in research.[7] When authors use ChatGPT's responses in their research, is the authors' research original in terms of work, idea and language? This question has great implications for how research is conducted and how the use of tools such as ChatGPT is acknowledged.

Issues in use of Work Created by LLMs such as ChatGPT

Recognising the origination of an idea or work is ethically and legally important as per the concepts of copyright and plagiarism. The concept of plagiarism is that the source of an idea must be cited, and someone else's ideas must not be passed off as one's own.[8] A definition of plagiarism that the literature mentions is - "plagiarism occurs when a writer deliberately uses someone else's language, ideas, or other original (not common-knowledge) material without acknowledging its source."[9] Copyright is a right that exists in original work, and a person cannot violate the copyright of another person by reproducing original work without permission.[10] Copyright also includes the moral right of attribution, which is the right of the creator of a work to

be acknowledged as the author of their work.[11] A person should not be attributed to work that is not their own.[12] Moral right to attribution is inalienable as opposed to monetary rights attached to copyright.[13] The moral right to attribution is also recognised by the Indian Copyright Act, 1957, which states that "[i]ndependently of the author's copyright and even after the assignment either wholly or partially of the said copyright, the author of a work shall have the right—(a) to claim authorship of the work."[14] Courts in India have recognised the importance of moral rights.[15] The moral right to attribution helps to recognise work as that of the author, giving the author social recognition and appreciation, which is a basic human desire.[16]

Therefore, the concepts of copyright and plagiarism recognise that there is a need to acknowledge the origination of an idea while creating and representing work, and one cannot copy other persons' work without permission and acknowledgement. Both concepts seek to ensure that a person's work is attached to their name and the person is recognised for their work. Therefore, when an idea and work has originated from a person, the person must be acknowledged, and the idea and work must not be presented as someone else's idea and work.

Considering the advent of large language models (LLMs) such as ChatGPT, the above-discussed issues need to be examined. Today, LLMs such as ChatGPT generate text that people use in their work. When is the use of work created by LLMs violative of the ideas of copyright and plagiarism discussed above? An answer to this question requires exploring the creation process when LLMs produce work.

Usually, LLMs respond to prompts that the user inputs into the LLM. LLMs are trained on massive databases of works and respond to prompts based on their training and the input prompt.[17] Is the work created by LLMs original? An answer to this question may have varied views. One view is that LLMs do not produce original work and merely copy and paraphrase existing works on which they are trained. Another view is that if the prompt by the user is innovative, the LLM could produce an answer that does not exist in the literature. The response of the LLM would draw connections in language and literature that have not been drawn before.[18]

Considering these two views, is the work created by LLMs an original idea, work and language? The response by LLM is often original language because

the LLM does not copy verbatim responses from other sources but presents responses in language that is creates. The response of LLM may be an original idea if the innovative prompts by users make the LLM draw unthought connections between existing ideas. The question of whether the LLM creates responses through an original process of creation is interesting. Here, there are different views. First, the LLM can be seen as a program that humans have created; therefore, the LLMs do not engage in an original creation process. The process is predefined by humans, and LLMs merely process like a microwave cooks food. Second, the LLM can be seen as engaging in the original process of creation because the LLM interprets the prompt that the user inputs and creates an output by a complicated process of creating text. Even the programmers of the LLM may not be able to predict the exact output that the LLM would give to user input.

If the LLM is assumed to create an original idea and an original work, the issues of copyright and plagiarism become key when responses by LLM are used by people in their research. If the work created by LLMs is used by people as their work by directly copying the output of the LLM, would it constitute plagiarism? Alternatively, if the work created by LLMs is paraphrased and presented as one's work, would it constitute plagiarism? Further, if work created by LLMs is understood by a person who writes the LLMs' ideas in their language, would it constitute plagiarism? During interaction with LLMs, the prompts and responses could lead to an original idea when the LLM draws new connections between existing literature. Would presenting those ideas in ones' language constitute plagiarism?

How should the issue of plagiarism and copyright be resolved when work created by LLMs is used?[19] Before answering this question, it is essential to ask if the output of the LLM is plagiarised.[20] The output of the LLM could be plagiarised if it states ideas without referencing their original source. However, if the LLM creates an idea that does not exist in the data it was trained on, the response of the LLM would not be plagiarising existing works. An interesting question is whether the LLM would be considered to plagiarise when it creates an idea that is existing knowledge but to which it did not have access in its training data.

When a person uses the plagiarised response of the LLM and presents it as their own, is the person plagiarising?[21] An answer to this question would depend upon whether the person acknowledges the source of information. Merely acknowledging that the source of information is the LLM may not suffice. The output of the LLM is not publicly accessible; therefore, it is difficult to verify that the author sourced the information from the LLM. Further, the reliability of the output of the LLM as an authentic source of information may be questionable[22] in terms of accuracy.

When a person copies an LLM's response verbatim and uses it as their own work, would the person infringe copyright? An answer to this question is complicated and would depend upon whether there is a copyright in work created by LLMs and who is considered the author and owner of such work. An answer to whether it would violate moral rights if the original source is not cited is dependent on who is the author of the work.

The terms of service of ChatGPT mention that the user owns all the ownership rights in the input and the output of ChatGPT. OpenAI assigns all rights, titles, and interests to the output to the user.[23] However, there is the concern that ChatGPT may give similar responses to different users. Therefore, when different users use the same response in their work, it can lead to issues of plagiarism and copyright. If two works are created by two authors using the same responses, who owns the rights in the work? Who should be acknowledged in future work?

These questions are important as we move into a world where ChatGPT could replace some facets of research, such as calculators replacing mental calculations. With the invention of calculators, people started to do calculations on the calculator instead of manually calculating and applying mathematics. With the coming of ChatGPT, the mental effort of finding an answer to a question by looking up relevant material and understanding it is reducing. Like mathematics was outsourced to the calculator, looking for answers in research is outsourced to ChatGPT. The scenario has changed from the past, where until LLMs were introduced, people would find relevant and related material to read and think through the material to say an idea that was their own.

These questions have implications for how the origination of ideas would be acknowledged in the age of LLMs. Today, LLMs are substituting writing and thinking in various fields. The lines between what is an original idea and what is not are being blurred. LLMs often produce responses without citing the

source, which blurs the source of the information. This makes information hold standalone value, with the focus shifting away from the source of information to the information itself. How should the issue of plagiarism be addressed when using work created by LLMs?

The Way Forward - A Plagiarism Policy in the Age of LLMs

The paper broadly proposes the following - when the response of the LLM is used by individuals, the individuals need to (a) cite the original source of information by looking for it (b) acknowledge the use of ChatGPT to derive ideas (c) acknowledge and quote the use of text generated by ChatGPT when the text is directly copied or when it is paraphrased.

In specific, when using responses of LLMs such as ChatGPT in academic work, the following needs to be considered -

(i) If the work copies the response of ChatGPT, the use of ChatGPT should be acknowledged, and the text should be presented in quotations. The original source of the information must be searched and acknowledged.

(ii) If the work paraphrases the response of ChatGPT, the use of ChatGPT should be acknowledged. The original source of the information must be searched and acknowledged.

(iii) If the work resulted from ideas generated during interaction with ChatGPT, the use of ChatGPT should be acknowledged for the help in generating the idea.

(iv) The moral rights in work cannot be assigned; therefore, although the user has been assigned the copyright in the output of ChatGPT, the moral rights are not assigned. Therefore, there is a need to acknowledge ChatGPT as the work's creator as per the right to attribution.

To enforce the above, there is a need for software that -

1. Recognise that ChatGPT responses have been reproduced verbatim

2. Recognise that ChatGPT responses have been paraphrased and used in work

3. Recognise that ideas have been used in work without citing the source by recognising the original source of ideas used in a work

The existing software that check similarity may be inadequate because they would not be able to check when responses of ChatGPT have been paraphrased

and used in a work. The existing software may not be able to detect accurately when AI is used to generate work. Some tools have been developed to detect text generated by AI including GPT-2 Output Detector and GPTZero.[24] However, newer tools are also available that make text generated by AI undetectable.[24]

There is also the need to consider the difference between idea plagiarism and language similarity.[25] Usually, software check for language similarity and flag words in the manuscript that are similar to other sources. While this can be useful to check if words and, by implication, ideas have been taken from another source, it does not solve the concern of idea plagiarism.[26] The work may have paraphrased another work and would, therefore, escape flagging by the similarity software as words would not be similar. However, the ideas would have been picked up from another work without citing the work. Furthermore, there is also the problem of proof as the user accounts to use LLMs are private between the user and the company offering the LLM. Therefore, it is difficult to know whether a person has created work by relying on the response of LLMs. Therefore, there is a need for software that checks for idea plagiarism and not language similarity alone.[27] While ChatGPT is an excellent tool for researchers and can help in academic progress[28], there is a need for ethical use of ChatGPT, considering the ideals of copyright and plagiarism.

LLM as Author and Issues of Moral Right to Attribution

LLMs often respond to prompts in ways that cannot be distinguished from humans' responses.[29] Should LLMs be considered the work's author and, therefore, acknowledged as authors in subsequent work?[30]

For a moment, if the responses of LLMs are seen in themselves, they would appear to be written by humans. Sometimes, the responses read like original information that only a human could imagine. While LLMs write like humans would, humans know that LLMs are a creation of the human mind and a tool in the hands of humans. It is still not accepted that LLMs have a mind and do not merely provide information based on the complicated program they are trained on.[31] On the other hand, if LLMs are not recognised as having a mind of their own[32] to respond by thinking about the prompts, they could be viewed as analogous to calculators, which are not acknowledged as authors when humans present their research involving calculations.

The reality is somewhere in between LLMs having a mind of their own and LLMs being analogous to calculators. While LLMs do not work as mechanically as calculators, LLMs also don't seem to have reached a stage where they have developed a mind of their own. LLMs work to produce responses by training on large amounts of data and through massive processing. LLMs can produce results that appear to be written thoughtfully, but the results are the product of massive and systematic processing rather than of the LLMs' mind.

Therefore, whose moral right to attribution is violated when a user copies text responses produced by the LLMs? If the LLM is not the work's author, they also would not have the moral right to attribution. Even if ChatGPT's terms of service assign all rights to the user, the moral rights wouldn't be assigned. Whose moral rights, if not the LLMs, are violated? This would depend on the unsettled question of who is considered the author of the work produced by LLM. The answers could vary from user, programmer, company, LLM, or a combination of the above.[33]

Larger Practical and Policy Implications for the Future

Today, there are innumerable possibilities for using LLMs in research. These include brainstorming and organising ideas, synthesising evidence, and improving human critical thinking such as by detecting errors and providing feedback for improving quality.[24] The better and more targeted the prompt, the better the response. Thus, the user can explain to the LLM exactly what they know and what they expect from the LLM. The capabilities of the LLM can be harnessed by intelligent promoting.

LLMs such as ChatGPT have possibly captured patterns of how knowledge is represented in language. LLMs seem to decipher the patterns of how humans combine words in English language to create meaning. When the user provides an input prompt, the LLM seems to decipher what the sequence of words indicates. LLMs then present users with output, which a sequence of words that responds to the possible meaning of the sequence of words of the input prompt.

Hypothetically, LLMs could get exponentially better with time. Over time and with several billions of interactions with humans, LLMs could understand human logic better. LLMs could grasp human thinking of these times in terms of ideas, logic, structure, reasoning, language, vocabulary etc. LLMs

could then be fine-tuned to respond with preferable and valuable ideas, logic, structure, reasoning, language, and vocabulary. Even presently, a scientific study suggests that ideas generated LLMs may be more novel than ideas written by subject experts.[34]

In the future, there may be a time when the responses of LLM are indistinguishable from work done by researchers in terms of language, reasoning and accuracy. For instance, over time, LLMs could understand the law better. One remarkable possibility is to train LLMs on large datasets of legal texts and judgements. There could be a combination of rule-based AI and LLM that could wire the AIs' thinking to the language and logic of the law.

However, there could still be possible challenges with the output of the LLM. A fundamental challenge with the outputs of the LLMs is that it is difficult to differentiate scientific knowledge from non-scientific knowledge. LLMs often respond in generic ways, which could make sense to non-experts in the field. However, the responses may not be accurate or have scientific weight. Therefore, it is difficult to differentiate between real knowledge and generic statements in the output of LLMs.

The larger question then is how plagiarism policies should be designed in a way that puts the progress of science at the forefront. In this context, there is a need for idea plagiarism software. In identifying whether ideas in text already exist in literature and where they exist, the novelty of ideas in a given text could be checked. The idea plagiarism software will test the boundaries of human thinking as people would want to escape idea plagiarism in ways that they say something novel.

Idea plagiarism software could possibly be developed by training an AI on all available literature in a field. The AI should be able to detect if the same ideas are repeated in checked text. The AI should be able to detect when existing ideas are paraphrased, indicating that the ideas are not original. The AI should also be able to detect how different ideas are combined to make any text that is checked. This is important because LLMs could produce different variations of an idea. LLMs would be able to design and mould language in multiple variations. In the multiple possible variations of language, it is important to identify original ideas.

Here, the idea plagiarism software will serve larger goals. It is important to consider that the goal of research and progress must be not only to be satisfied with

answers that make sense but to push the boundaries of knowledge by enquiring into the unknown. There will almost always be that unknown that humans would need to decipher. Therefore, policies should judge research output by the novelty of thought, and what the research discovers about the unknown.

The relevance of the academic community's work will increase multifold. The role of academics would be to make students operate at a level of enquiry and curiosity for endless possibilities. Like calculations were delegated to calculators, so will the work on literature review and data analysis. The job of the human mind would be to explore how to combine and synthesise knowledge to solve problems in novel and optimal ways.

With the demands of the legal fraternity and with the demands of various institutions and actors, AI development will evolve. It is only a matter of time and resources to conceptualise the problem and train the AI to make them intelligent in ways that supplement human needs. It would not be unrealistic to suggest that there is a need in the future for powerful AI to be developed to allow people to create their own AI or version of AI. Technologists need to enable ordinary people to create AI at the click of a button using imaginative prompting. This would open the next frontier of human exploration.

Conclusion

In light of the above, the policies would need to consider the following. Anything picked up from LLM output verbatim must be in quotations. This would indicate to the reader that the material is by LLM. There must be robust software to check whether text has been generated by LLMs. It would allow the reader to judge the output carefully for its scientific weight considering that the output is from LLM. Besides, anything picked up verbatim from an existing published source must be in quotations. When text from any source (LLM or published material) is not within quotations, the software must check whether the text is similar to existing published material. The idea plagiarism software should check whether the text is an idea from an existing source i.e. whether an idea existing in literature has merely been paraphrased and presented. There is a need to ensure citations for such sentences. There needs to be human oversight to check whether the citations are relevant. Human experts also need to check whether an overall novel and significant idea emerges from the text.

While the paper proposes the above, it is also important to discuss larger questions for the future. For instance, should it be necessary to distinguish whether work has emanated from humans or LLMs? Is the progress of knowledge more important than the source of the knowledge? What are we seeking to achieve through research? What do plagiarism policies seek to achieve ultimately? If the LLM output is allowed to be used in research without the need for quotation, paraphrasing and acknowledgement, would we enter a world where the only consideration is the novelty and truth of ideas?

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