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THE CHALLENGES OF GENERATIVE ARTIFICIAL INTELLIGENCE: AN AMERICAN PERSPECTIVE

ПРОБЛЕМЫ ГЕНЕРАТИВНОГО ИСКУССТВЕННОГО ИНТЕЛЛЕКТА: АМЕРИКАНСКИЕ ПЕРСПЕКТИВЫ

Abstract:

The emergence of Artificial Intelligence (AI) specifically Generative AI (GAI) based on LLMs (Large Language Models) has recently caught the attention of just about everyone, including educators. The entire concept is not completely new, but its emergence in user-friendly forms has surpassed our knowledge and standard best practices. For scholars the question of integrity and original efforts seems to dominate. Is it a threat, and how can and ought one respond to it? At the very least it calls for a deeper appreciation and understanding as well as the development of approaches, skills and tools to aid in our own implementation of AI in our classrooms, offices, on our desktop, laptop or smart phone.

Keywords: Artificial Intelligence (AI), Generative AI (GAI), Large Language Models (LLMs)

Аннотация:

Возникновение искусственного интеллекта (ИИ), в частности, генеративного ИИ на основе больших языковых моделей (БЯМ), в последнее время привлекает внимание практически каждого, включая педагогов. Весь концепт не совсем нов, но его появление в удобных для пользователя формах превосходит наши знания и стандартные лучшие практики. Для ученых преобладает вопрос о том, до какой степени работы наших учащихся являются их самостоятельными. Угроза ли это, и как можно и нужно на нее реагировать? По крайней мере требуется более глубокое понимание, а также разработка подходов, навыков и ресурсов для помощи во внедрении ИИ в наших курсах, офисах, на наших настольных компьютерах, ноутбуках или смартфонах. [1]

Ключевые слова: Искусственный интеллект (ИИ), Генеративный ИИ (ГИИ), Большие языковые модели (БЯМ)

Introduction

I begin with a recognition that what follows represents an American viewpoint. I have learned from interactions with my colleagues around the world that what may be new in the United States may be old news in Japan or Korea. Nonetheless the corpus on which much of the material that powers AI is based is in English. That literature in the Digital age is already immense and at best we can hope to be a guide or resource. A Google search on August 14, 2023 for “ChatGPT” cited 543,000,000 references! (For comparison the US Library of Congress has merely 40,000,000 books and the Russian State Library 15,000,000.) ChatGPT is currently the most prolific and highly used tool of Generative Artificial intelligence that is based on so called Large Language Models (LLMs). Most recently references to AI are actually to GAI and LLM.

What Can AI Do? At the moment it can produce text, images, video, and sound, drawing on an enormous and ever growing base of data. It can summarize, analyze, translate, all in an instant. Work that once required students to read, research, organize, and then prepare original responses to what they had encountered can now be replaced, changing assignments that previously took hours into ones that take minutes, the time needed to type or dictate a prompt. All of this is occurring in a rapidly changing environment in which future developments are emerging in the time from when this article was conceived and written to when it is published.

Examine the following paragraph generated by ChatGPT as an alternative introduction to this paper.

“Generative Artificial Intelligence (AI) has witnessed remarkable advancements in recent years, particularly in the form of Large Language Models (LLMs). These models, such as OpenAI's GPT-3, have demonstrated astonishing capabilities in generating human-like text and engaging in natural language interactions. While they hold significant potential for revolutionizing various fields, including education, concerns have emerged among educators and scholars. This article delves into the concept of generative AI, the role of LLMs, the concerns raised by educators and scholars, and offers suggestions for appropriate responses to ensure responsible and effective integration into education.”*[2]

The summary generated by instructions provided by me is excellent, but note that it contains a reference to itself, a form of self-promotion.

While there is no doubt much that is new and exciting about GAI, one must wonder if we have not heard the voices of alarm before, in response to word processing and auto correction, machine translation programs and apps, search engines, online writing and editing sites, virtual reality, massive open online courses, etc.

The current state of affairs

“One of the reasons so many people suddenly care about artificial intelligence is that we love panicking about things we don’t understand.”*[3]

GAI is already here, it is widely used in industry, research, and education by our students, and that number is growing exponentially. In the United States it is user friendly, readily accessible, enormously fast and essentially cost free. The situation is ever evolving. As of this moment (September 2023) some major AI engines such as Chat GPT are not open to individuals living in certain countries, although the situation is constantly changing. Alternatives are emerging, such as Gigachat in Russia. No doubt every nation will need to develop its own variant of the GAI and response to remain competitive in the 21st Century.

What is it? The GAI models most frequently cited are ChatGPT (chat.openai.com) funded primarily by Microsoft, Bard (bard.google.com) developed and funded by Google and Claude (claude.ai). (Dall-E (openai.com/dall-e-2) concentrates on image generation). These interactive programs accessed through the Internet/WWW rely on accessing massive amounts of text (LLMs) already on the Internet. They use this base to construct human like text in response to prompts by predicting successfully logical next words to construct sentences and complete paragraphs, even complete documents. This all occurs with lightning speed, usually merely a few seconds. The programs are also capable of learning, i.e. taking in human input to improve on the responses. They are very capable of generating text based on synthesis and analysis of information; they can provide outlines and summaries, do translations, interact in several languages.

The output while grammatically and orthographically correct is highly dependent on the input, called a “prompt”, and the database. It can be, but is not always, factually correct. So while the response may sound convincing, it may not be reliable.

The ability of students and scholars to create complete documents in seconds or minutes raises a number of concerns. Is their work original, and what do we mean by original? Can one verify the originality and authenticity of any text? Can one rely on the veracity of the text, including citations that may be fictionally generated by a machine? The very nature of any written word becomes suspect. Professional script writers of movies and television in the United States are already on strike, feeling that their own existence is threatened when machines can produce original efforts. Professional translators whose work has already become more reliant on machine translation are equally threatened by the new technology. A number of recent articles have addressed the threat to the very existence of our profession, although most conclude that we instructors will continue to play the central role in education.[4]

In addition to the questions of originality there are questions of privacy. If one inserts a student’s text into any of the existing programs reputed to identify human vs. machine speech, does that text not become a part of the corpus eventually relied upon, and does that violate a student’s right to privacy? My own personal experience with two of the more popular “text checkers,” Turnitin (<https://www.turnitin.com/>) and GPTZero (<https://gptzero.me/>) has proven that they are not in themselves 100% accurate and reliable. There have recently been documented cases where students have been falsely accused of plagiarism or dishonestly, submitting machine generated work, when in fact it has been the student’s own original contribution.

How are educational institutions responding the new technology? Originally there was an immediate response prohibiting the use of GAI in the preparation of student work. More recently there have been mixed and guarded responses suggesting a myriad of approaches ranging from prohibition, to inclusion with citation, to full use and a transparent analysis or elation of the machine generated text itself. Most of these policy statements recognize that the environment is changing and requires close monitoring and perhaps modification going forward. My own institution, Middlebury College, recently informed all faculty of a new current policy. In an e-mail from the Provost on August 22, 2023 the following was communicated:

Communicate clearly with students your expectations related to generative AI via your course syllabi, within the specifics of relevant assignments, and in class conversations. You have options for how to handle generative AI in your classes:

Option 1: Use prohibited. Sample syllabus language: Using AI tools (e.g., ChatGPT, Bard) is forbidden in this class. You may not use them to assist in any part of your homework or other assignments. Any use of generative AI tools will be treated as a violation of Middlebury’s Honor Code.

Option 2: Limited use. Sample syllabus language: You may use AI tools (e.g. ChatGPT, Bard) to help generate ideas and brainstorm, but only on assignments for which I have given permission to use AI tools, as specified on the syllabus. Outputs generated by these programs may be inaccurate, incomplete, or otherwise problematic. I will hold you accountable for the accuracy of your work. Be aware that use of AI may also limit your own independent thinking and creativity. Do not submit any work generated by an AI tool as your own. If you include material generated by an AI tool, it should be cited like any other reference material (e.g., MLA or APA style citation). Any uncited or inappropriate use of AI tools will be treated as a violation of Middlebury's Honor Code.

Option 3: Required use. Sample syllabus language: You are expected to use AI tools (e.g., ChatGPT and image generation tools) in this class. In fact, some assignments will require it, with appropriate citation (e.g., MLA or APA style citation). Learning to use AI is an emerging skill and we will be learning that skill together. If you have concerns about using these tools, please talk to me about your concerns so that we can find suitable alternatives.

The guidance ends with an admission that “we recognize that the proliferation of these tools may require us as a community to reimagine aspects of teaching, learning, and assessment.”

Practical Suggestions

What are the implications today for the pedagogy of teaching language and literature?

As educators and scholars we should first recognize that GAI is here to stay. Our students and colleagues are using it, even if we are not. The essential first step is to educate ourselves on the existing modalities, understanding that the accelerated development of these tools presents real challenges and requires constant follow up.

One of the ways to learn about GAI itself is through the readily viable resources. One can follow and read some fairly simple and general overviews such as “What is generative AI?”[5] Another article addresses “What do you need to know about AI?”[6]. Aatish Bhatia has provided a multimedia introduction: “Watch an A.I. Learn to Write by Reading Nothing but ...”[7]. A more comprehensive discussion can be found at the Office of Educational Technology report “Artificial Intelligence and the Future of Teaching and Learning.”[8]

Alternatively you can participate in workshops and conferences on the subject, and even review virtually past events. I have attended three such sessions: one the Stanford Spring 2023 Symposium [9], another hosted by the Modern Language Association [10], and most recently a three day workshop at Middlebury College. [11]

The next step is to experiment with these programs. You might be able to sign up for a free account at ChatGPT (<https://openai.com/chatgpt>), Claude (<https://claude.ai/login>)

or Bard which requires a google account (<https://bard.google.com/?hl=en>). After signing in, the basic mode of interaction is the prompt, the statement and question typed or spoken into the program. The output is highly dependent upon precise input, the more precise the prompts the better likelihood of a good answer. There is already a large literature on “prompts”. [12] The short summary is that each prompt should instruct the program to assume an identity or role, followed by the task, a request to question. Follow-up instructions (regenerate) can improve on the original output. Two samples below indicate the time saving aspect of GAI.

Me: You are an example generator. Provide students with six examples in Russian of using the prepositional case in the sentences such as: я живу в Лондоне, он живет в Москве.

ChatGPT: Certainly! Here are six examples of sentences using the prepositional case in Russian:

Она работает в офисе. (She works in the office.)

Моя книга лежит на столе. (My book is on the table.)

Они гуляли в парке. (They were walking in the park.)

Мой друг учится в университете. (My friend studies at the university.)

Я обедаю в ресторане. (I have lunch in the restaurant.)

Кот сидит на крыше. (The cat is sitting on the roof.)

These sentences showcase the use of the prepositional case to indicate location or position.* (ChatGpt on 2 Sept. 2023).

Another example is to ask for a written summary.

Me: In the novel Anna Karenina by Lev Tolstoi, who suffers more: Anna or Vronsky? Answer in a complete paragraph in Russian of 200-250 words.

ChatGPT: В романе "Анна Каренина" Льва Толстого можно утверждать, что больше страдает Анна Каренина. Начиная с момента, когда она решает покинуть своего мужа и семью ради любви к Алексею Вронскому, ее жизнь начинает развиваться в негативном направлении. Анна сталкивается с социальными предрассудками и критикой общества, которое не одобряет ее решение. Ее чувства переполняются ревностью, паранойей и внутренним конфликтом, что приводит к ее душевному и физическому упадку.

С другой стороны, Алексей Вронский тоже несет свою долю страданий, но его страдания в основном связаны с потерей Анны и ее любви. Он остается живым и имеет больше возможностей для восстановления своей жизни, хотя и с трудом. В конечном итоге, Анна совершает трагический выбор, что делает ее страдания наиболее глубокими и длительными. Ее внутренний конфликт и тяжелое эмоциональное состояние приводят к трагическому финалу, что подчеркивает, что ее страдания в этом романе намного более интенсивные и разрушительные, чем страдания других персонажей, включая Вронского.* (ChatGpt on 2 Sept. 2023).

One advantage of Bard AI, unlike CatGPT 3.5, is its ability to scan the internet.

Me: Check out the listings for theater in Moscow and give me a list of ballet performances in September.

BardAI: Sure, I found some ballet performances in Moscow in September:

The Sleeping Beauty at the Bolshoi Theatre on September 10, 17, 24, and 30. This classic ballet is set in a magical kingdom and tells the story of a princess who is cursed to sleep for 100 years.

Swan Lake at the Stanislavsky and Nemirovich-Danchenko Music Theatre on September 1, 8, 15, and 22. This tragic love story is set against the backdrop of a beautiful lake and features stunning choreography.

Giselle at the Moscow Classical Ballet on September 5, 12, 19, and 26. This romantic ballet tells the story of a peasant girl who dies of a broken heart after her lover betrays her.

Don Quixote at the New Opera Theatre on September 3, 10, 17, and 24. This comedic ballet tells the story of a love-struck knight who sets out on a journey to find his lady love.

These are just a few of the many ballet performances that are happening in Moscow in September. I hope you find something that you enjoy!*

Me: Translate the list into Russian.

BardAI: Sure, here is the list of ballet performances in Moscow in September translated into Russian:

Спящая красавица в Большом театре 10, 17, 24 и 30 сентября. Этот классический балет, действие которого происходит в волшебном королевстве, рассказывает историю принцессы, заснувшей на 100 лет из-за проклятия.

Лебединое озеро в Музыкальном театре им. Станиславского и Немировича-Данченко 1, 8, 15 и 22 сентября. Эта трагическая история любви разворачивается на фоне красивого озера и отличается потрясающей хореографией.

Жизель в Московском Классическом Балете 5, 12, 19 и 26 сентября. Этот романтический балет рассказывает историю крестьянской девушки, которая умирает от разбитого сердца после того, как ее возлюбленный предает ее.

Дон Кихот в Новом Оперном Театре 3, 10, 17 и 24 сентября. Этот комедийный балет рассказывает историю влюбленного рыцаря, который отправляется в путешествие, чтобы найти свою возлюбленную.

I hope this helps!*. (Bard AI. 2 Sept. 2023).

A prompt to Claude offered a set of well written paragraphs, but with serious inaccuracies.

Me: Write 250 words about Prof. Thomas Beyer of Middlebury College

Claude: Here is a 250-word paragraph about Professor Thomas Beyer of Middlebury College:

Professor Thomas Beyer is a distinguished member of the Middlebury College faculty, where he has taught for over 30 years. As a professor of Russian language and literature, Professor Beyer is renowned for his dynamic teaching style and deep passion for the subject. He completed his undergraduate studies at the University of Wisconsin, followed by graduate work at Harvard University, where he received his PhD in Slavic Languages and Literatures.

Throughout his prolific career, Professor Beyer has authored numerous books and articles on topics related to 19th and 20th century Russian literature. Some of his most influential publications include "The Poetry of Anna Akhmatova," "Nikolai Gogol and the Ukrainian Imagination," and "Dostoevsky's Petersburg: The Modern City as Apocalyptic Landscape." He is considered one of the foremost experts on Fyodor Dostoevsky in the United States.

In addition to his scholarship, Professor Beyer is beloved by students for his thoughtful mentorship and commitment to creating an inclusive classroom environment. He encourages vigorous intellectual debate and constantly challenges students to examine texts from new perspectives. Many alumni credit Professor Beyer with instilling in them a lifelong appreciation for Russian literature and culture. His

passion for teaching Russian is evident in the devotion and admiration expressed by generations of Middlebury students.

After more than three decades at Middlebury, Professor Thomas Beyer continues to exemplify the highest qualities of scholarship, pedagogy and mentorship. He is an invaluable contributor to both the Russian department and the college as a whole.* (ClaudeAI, 3 Sept. 2023).

The inaccuracies are glaring. I taught at Middlebury College for forty five years, not “thirty.” I completed my undergraduate studies at Georgetown University, not the “University of Wisconsin,” followed by graduate work at the University of Kansas not “Harvard University.” I have translated Andrei Bely's *The Christened Chinaman* and *Glossolalia*, but not authored “The Poetry of Anna Akhmatova,” “Nikolai Gogol and the Ukrainian Imagination,” or “Dostoevsky's Petersburg: The Modern City as Apocalyptic Landscape.” I am considered an experts on Andrei Bely, not “Fyodor Dostoevsky” in the United States. The rest of the entry is flattering but no more accurate than what precedes it. In a similar prompt to Bard I was provided with equally incorrect information including several citations and links to entirely different people. GAI has been known to fabricate sources and citations.

My own personal experience indicates that the purported factual information is often not inaccurate. The results of queries also change almost daily. Like Wikipedia and Google Translate these programs can learn and be corrected. Users of the technology must be made aware of the consequences of relying on these sites for information. **This may be the most immediate serious issue going forward—inaccuracy of the information.**

It becomes clear that not only we as instructors, but our students and colleagues can use the tools to produce technically high quality written materials. There has been a tendency to forbid people from using the tool, but that quite frankly is not easy to enforce and may be unreasonable to even suggest. Rather we should all be aware that the output may or not be accurate. Thus one key going forward is to have students check the correctness of the output and make necessary revisions before identifying transparently their use of the medium, and then claiming ownership of the revised submission.

One key to successful use of the medium is to first identify the pedagogical goals of the assignment and or assessment instrument. What is the student expected to learn and master? Is the purpose to learn the proper formation and usage of the prepositional case in order to express where one lives or works? Is the goal of the writing assignment to have students read, summarize, analyze and examine the content of a novel? Do written out of class assignments adequately enhance the intended goal?

One solution has been to require in class writing where the non-use of outside resources can be monitored. The Modern Language Association, however, has pointed out that our classes should rely on real world authentic practices and few in the work place will be required to do in office monitored writing without reliance on viable tools. An alternative might be to rely on in-class verbal responses, group work, demonstrations and performance, the preparation of a video, etc.

One important addition to written work generated or assisted by GAI is to indicate to students and colleagues how academic honesty is preserved by “transparency,” i.e. identifying and documenting the use of resources by citation.

Conclusions

Generative Artificial Intelligence is here to stay. We are at the beginning of its development. It is being widely used and will likely become even more present in the coming months and years. Those most familiar with the medium are honest in declaring that they do not understand or know what the future holds or all of its current and future implications.

We require ongoing professional development to effectively implement the use of GAI both inside and outside of our classrooms. We must be and make our students aware of the dangers of accepting as “factual” any information provided without subsequent verification.

None of this is entirely new, nor should it be viewed as a threat or set of challenges previously never encountered. The advent and use of computers, tablets and smartphones have all been successfully accepted as everyday “tools,” “resources.” Search engines, spell and grammar checkers, translation programs are all integrated into our lives. Yes, there will be changes in how we work. Some roles will be judged unnecessary, others will flourish, acquire new dimensions, and new roles and responsibilities will emerge. The need for ongoing experimentation and renewal has been accepted by those of us in education as a part of who we are and what we do. In the best of times we have embraced change eagerly and responsibly and made modifications that serve the best interests of our learners.

Five years ago, I reviewed the developments of technology and their applications to our teaching at the time. In it I offer the following observations:

The future (at least for the next few years) more than ever before calls upon us to be guides for our students. We can and should embrace enthusiastically what technology can do to enhance learning.... It is also important that we integrate them into our courses inside the classroom and offer suggestions or assignments for outside of the classroom.... [W]hatever we can do today is likely to become old-fashioned in a very short span of time.... Consequently, at the same time, we should transfer to our students the responsibility for identifying, using, and even creating or scripting new applications that best meet their needs. Most of us are neither capable nor efficient at designing apps or adapting whatever new system will emerge in the next ten years. Our students are the real experts in this new mobile world. With encouragement, they can discover their own learning styles and strengths and apply them in their own individual cases. (235) [13]

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Author’s contribution: *The work is solely that of the author.*