How to Utilize AI to Assist in Reading and Writing Academic Papers

Tse-Wen Hong
tsewen.hong@gmail.com

Abstract

Theses, Dissertations, Papers and other academic writings are the crystallization of human intelligence. With the popularization of education and the application of computers and the internet, the number of publications in various journals has significantly increased. According to a report by the National Science Foundation [1], the global research output, measured by peer-reviewed scientific and engineering journal articles and conference papers, grows at an average of about 4% per year. In 2018 alone, around 2.4 million journal articles and conference papers were published globally, of which approximately 80% were journal articles and about 20% were conference papers.

In such a vast pool of papers, accurately searching, quickly and efficiently interpreting papers has become an increasingly important skill. With the help of AI, such tools have come into existence. The following will introduce the usage of these tools through examples.

1. Introduction

The advent of the internet and search engines has enabled seamless exchange and access to a vast amount of knowledge and information stored in the cloud, greatly reducing the time scholars and researchers spend visiting libraries, browsing shelves, and perusing books, journals, and papers. By the end of 2022, ChatGPT introduced ways for the public to conveniently utilize artificial intelligence as a work assistance tool. This development is to personal computers what the Apple II was, marking the dawn of a new era. A few months after the launch of ChatGPT, platforms using the OpenAI engine (similar to ChatGPT) proliferated. Many of these are specifically developed for scholars and researchers who need to extensively read and analyze a

large number of articles. Mastering these tools can save a substantial amount of time in interpreting information and researching new knowledge. Of course, choosing, trying, and mastering new tools all require a certain learning curve.

The current academic environment is facing the challenge of information overload. With the rapid development of technology, a plethora of academic papers are emerging, making the demand for scholars to quickly and accurately locate needed data in the research process more complex. Additionally, traditional literature retrieval and analysis methods are limited in efficiency and accuracy. At this point, the rise of Artificial Intelligence (AI) technology has brought revolutionary changes to academic research. Artificial Intelligence, through algorithms and big data analysis, assists scholars in conducting literature retrieval and data analysis more efficiently and accurately, enhancing the quality and efficiency of research. For example, Natural Language Processing (NLP) technology can analyze text data, extract key information, and help scholars quickly understand the main content and structure of the literature.

The content below in this article is my summary of the selection and usage experience of these tools. I hope sharing these learning processes can help others improve learning efficiency. The emergence of artificial intelligence in academia is not just a technological leap; it also alleviates the heavy workload and extensive time traditionally associated with academic research and writing, making learning easier and more productive. Platforms like ChatGPT, based on the OpenAI engine, are expanding the possibilities of artificial intelligence in academia, helping scholars navigate the extensive and growing world of academic publications. The actual impact of artificial intelligence on academic pursuits is immense, and the ability to effectively use these tools is becoming an indispensable skill in modern research work.

In summary, the integration of artificial intelligence into academic research and writing marks a trans formative phase in the fields of education and knowledge dissemination. It is optimizing the absorption and interpretation of information, making academic pursuits more streamlined and fruitful. Sharing insights and experiences using these revolutionary tools can serve as a beacon,

guiding more and more people to explore and embrace the potential of artificial intelligence in academia, thereby collectively elevating the quality and impact of academic work.

2. Reference Literature

"Can Artificial Intelligence Enable ‘Super Reading’?",
The author is the associate research librarian of the Library of Renmin University of China,
Published in the "China Education Newspaper", June 14, 2023, Edition 9, Title: Reading Weekly.

The theme of this article is a discussion on how AI (Artificial Intelligence) can enable ‘Super Reading’. The document points out that with the development of AI technology, its application in high-quality reading has attracted widespread attention. However, due to the many limitations of traditional reading methods, AI is regarded as a new model capable of breaking these limitations, enhancing individual reading experiences, efficiency, and effectiveness. Through the use of AI interactive objects with natural language communication and understanding capabilities, AI can help readers clearer understand their needs and offer personalized literature integration, literature review, and knowledge structuring services. Additionally, the application of AI can also eliminate the differences brought about by individual information literacy imbalance, reduce the chances of a new type of ‘digital divide’ occurring between individuals, and bring reading freedom and pleasure to more people. However, the development of AI also faces many challenges, such as problems with training data, risk control, and technology ethics. Nevertheless, the application of AI in assisted reading still has breakthrough possibilities and is expected to stimulate new reading needs, improving society’s overall intelligence and creativity.

As the old saying goes, ‘To believe in everything in books is worse than having no books’! The article also emphasizes the risks faced by AI in the process of assisted reading including:

Risk of False Information Spread: During AI-assisted reading, if there is false information in the training data, and this false information is automatically derived and interactively spread on a large scale, it may lead to widespread ‘confusion between true and false, misinformation’.

Privacy and Security Risk: AI technology requires a large amount of data for training, so the leakage of individual privacy and data security issues are one of the

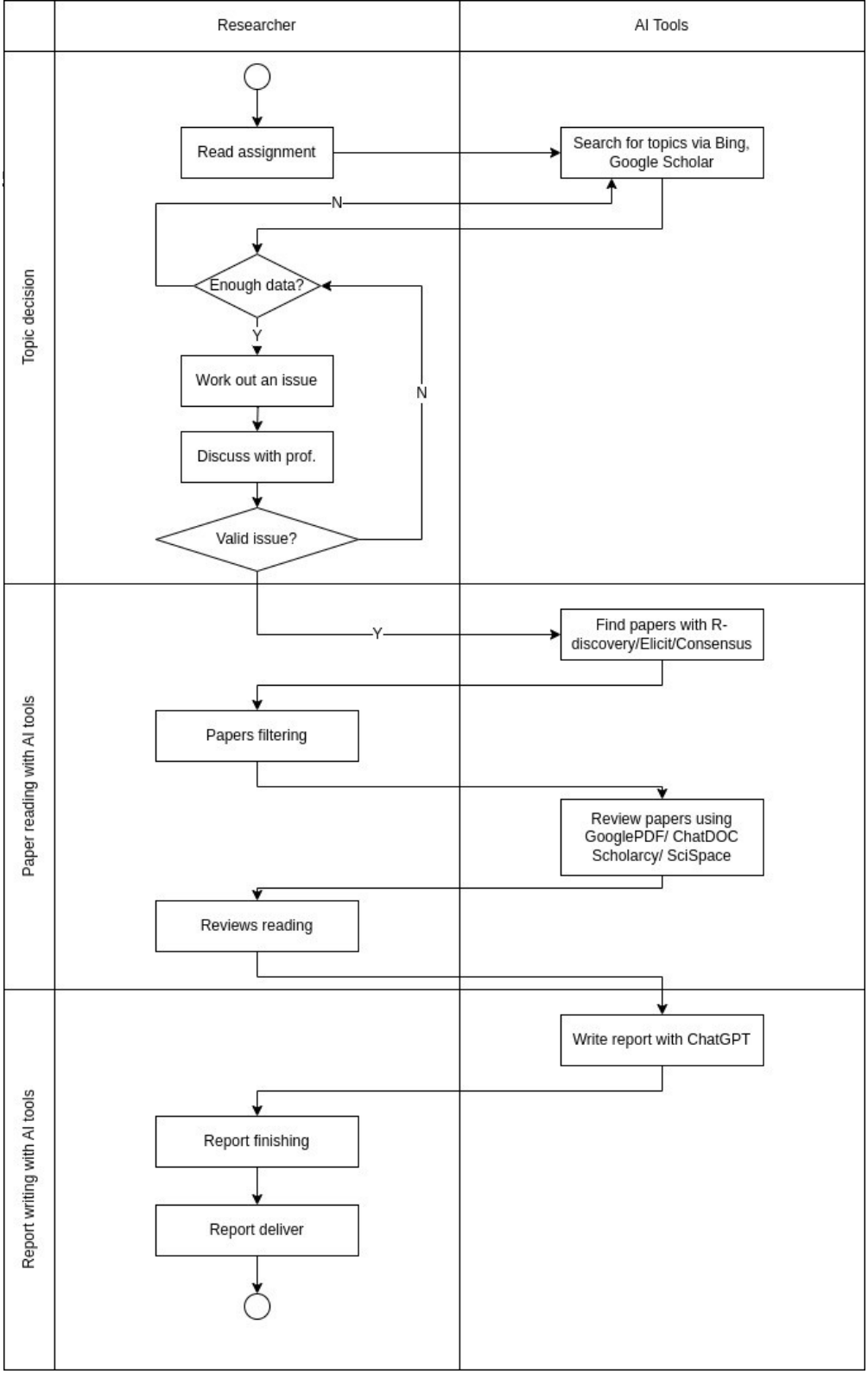
significant risks in AI-assisted reading.

Alienation in Technical Understanding: With the development of AI, its internal operational logic has become very complicated and is a “black box” difficult to understand and predict its behavior and decision-making process for most ordinary people. This leads to possible technical risks and understanding alienation in the process of AI-assisted reading.

However, in the mighty current of progress in the grand era, we cannot be timid and stand still in the face of potential risks. Therefore, what I am currently exploring is mainly how to use the tools and fully utilize the advantages and convenience they bring. [2]

3. Discussion

This study is primarily focused on the application of AI in thesis research and writing. Therefore, data sources are primarily obtained through the internet, especially through the use of AI tools, employing methods such as searching, comparing, studying, and organizing to practically test the latest status of AI applications in academic fields.
Data collection will use the same topic, and through various commonly used, or newly launched AI tools that claim to be highly effective, to perform procedures like searching, studying, and analyzing. The functionalities of various tools will be compared, and standard procedures will be summarized, illustrated in the form of a flowchart as follows.



For example, when searching for papers, the following can be done through Bing:

Please recommend 3 papers related to 'Information Management Science' that meet the requirements:

Impact Factor higher than 3

Cited more than 50 times

Published within the last 15 years. (After 2008)

Or, for individual topics or using the title of a found paper,

searching can be done through Google Scholar or Google. As for references for writing papers, for example, you can ask ChatGPT:

I am a doctoral student majoring in [Information Management Science], trying to write a research report on [How to Apply AI to Assist in Reading and Writing Papers]. I need you to provide a content framework for this report, assuming the role of a professor expert in the same research field.

After testing the above-mentioned apps, I find Scholarcy and Scispace more user-friendly and useful, and am considering the following work sequence in the future:

Bing, Google Scholar ----> Scholarcy, Scispace ---> ChatGPT mainly. If other perspectives are needed, or if I want to experiment, I might also use other tools like ChatPDF, ChatDOC, etc.

4. Conclusion

AI indeed offers significant ‘assistance’ in reading and writing scholarly papers, but such ‘help’ should not and cannot be seen as a ‘substitute’. Different applications excel in different areas when it comes to assisting with reading and interpreting papers; some can quickly generate summaries of varying lengths, while others can conduct extensive or targeted discussions and inquiries on topics. However, these ‘assistive features’ should be regarded as a ‘classmate’ who is intelligent, doesn’t need rest, and is always ready to discuss. Interacting with them might stimulate different directions of thought and save considerable time, but deeper thinking, summarization, and interpretation still rely on the individual.

Furthermore, AI can also aid in the process of writing papers, such as providing reference frameworks, discussing section by section, polishing text, and giving revision suggestions. However, the content that is the product of deep contemplation and expressions that align with the author’s intentions are things that AI can’t replace, as they represent the independent will of the author.

Thus, my conclusion is: Independent will and deep thinking are the true essences of a good paper. The main role of AI tools is to help

you save some time so you can devote more energy to analysis, thinking, and writing. When using tools, quality is more important than quantity, and everyone has different habits in using tools. Therefore, embracing AI, quickly learning and trying out one or two handy apps, and mastering the use of these tools should indeed be very helpful for finding suitable references and increasing time spent on deep thinking.

5. References

[1] Report on the Quantity of Paper Produced by the National Science Foundation of the United States, https://ncses.nsf.gov/pubs/nsb20206/

[2] Can Artificial Intelligence Bring About ‘Super Reading’? The author is the Deputy Research Librarian of Renmin University of China, published in China Education Newspaper, June 14, 2023, Page 9, Section: Reading Weekly