

ChatGPT-Powered URL-Based Research Paper Summarizer [†]

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Abstract: Generative Pre-Trained Transformer (GPT) models excel in text generation, text compilation, and language-related tasks. ChatGPT is based on the GPT model that responds to queries and has human-like conversational capabilities. This includes writing posts for social media, software codes, emails and essays, etc. We tried to use ChatGPT for creating a research paper summary. During our experimentation using ChatGPT, we found that ChatGPT cannot directly read links or URLs, as it is trained on a large amount of text data. Research paper summarization is essential in academics. Hence to solve this problem of research paper summarization using ChatGPT, a software system was designed. In this paper, we present how the capability of ChatGPT could be enhanced to summarize pdfs when a URL is provided. Furthermore, the generated summary can be modified in different styles of writing such as creative, expanded, shortened, and professional.

Keywords: ChatGPT; URL search; crawling; text summarizer; AI; prompt

1. Introduction

The Generative Pre-Trained Transformer (GPT) was a sophisticated natural language processing model created by OpenAI. The model employed transformer architecture, showcasing exceptional proficiency in processing and generating text that closely resembled human language. GPT underwent an initial training phase where it was exposed to a large amount of online text data. This exposure enabled GPT to acquire knowledge about grammatical structures, context, and semantics by making predictions about the next word in a phrase. The transformer design of GPT incorporated self-attention methods to effectively capture extensive interdependencies within sequences. Using GPT, ChatGPT, a conversational language model was developed. Brady D. Lund examined the functionality of ChatGPT [1], its underlying Generative Pre-Trained Transformer (GPT) model, and the procedures of unsupervised pre-training and supervised fine-tuning.

Its purpose is specifically tailored for participating in conversations using natural language. ChatGPT's skills are derived from its comprehensive pre-training on a wide range of internet material. This enables it to comprehend and produce conversationally appropriate responses that are relevant to the situation.

ChatGPT is highly skilled at completing sentences or paragraphs using given prompts, making it a powerful tool for generating content that is intelligible and contextually appropriate. Although ChatGPT is not specifically designed for translation purposes, it can provide assistance in creating translated text for simple language translation projects. ChatGPT demonstrates exceptional proficiency in generating succinct summaries of a given language or subjects, showcasing its ability to condense information into more compact paragraphs.

ChatGPT is a flexible tool that may be used for various creative writing assignments, producing inventive and contextually appropriate content. Although not its main objective, people have utilized ChatGPT to generate code snippets. Users can interact with ChatGPT



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for educational purposes, delving into a wide array of topics since the model offers information and context on numerous themes. Abid Haleem et al. [2] has acknowledged and thoroughly explored the crucial functions performed by ChatGPT in the current situation. The neural language models supporting character AI have been carefully designed to particularly address conversational dynamics. This technology framework involves the application of deep learning algorithms to understand and produce written material. The algorithm adeptly understands the complexities of human-generated natural language, extracting valuable information from enormous datasets collected from the internet.

1.1. Review on the Limitations of ChatGPT

ChatGPT has also certain limitations. Indrasen Poola highlighted the necessity for enhancing chatbots and language models [3]. The limits of ChatGPT, notably in areas such as logic and factual correctness, were emphasized despite its impressive potential. The study sought to provide a valuable contribution to the future progress of chatbot and language model development. Zheheng Luo et al. examined the problems regarding factual inconsistencies [4] in generated summaries by utilizing large language models (LLMs). It specifically investigated the evaluation capabilities of ChatGPT under a zero-shot environment. The results demonstrated that ChatGPT consistently surpassed previous metrics, highlighting its potential for evaluating factual inconsistencies. Yiheng Liu et al. [5] offered an analysis of ChatGPT's skills, examined possible consequences, tackled ethical considerations, and presented recommendations for further progress in this domain. Anis Koubaa et al. [6] conducted a thorough analysis of ChatGPT, highlighting its technological advancements in comparison to previous models and critically evaluating existing research from multiple perspectives. The study also outlined upcoming problems and areas of research pertaining to ChatGPT. Guido Zuccon et al. [7] discovered that while ChatGPT produced correct or somewhat correct responses, the majority of the time, the suggested references were only found to exist 14% of the time. Additional information was provided on the created references, revealing similar traits among them. Even when a reference offered by the model existed, it did not always support the claims attributed to it by ChatGPT. Shadi AlZu'bi et al. [8] developed a Python-based text classification model for a chatbot. The model underwent training using a dataset that consisted of consumer replies to a survey, along with their corresponding class designations. Multiple classifiers, such as Naive Bayes, Random Forest, Extra Trees, and Decision Trees, underwent training and testing. The results indicated that the Extra Trees classifier surpassed the other classifiers, with a 90% accuracy rate. Tianyu Wu et al. [9] examined the advantages and disadvantages of ChatGPT, rethinking its duality in several sectors. While it was widely acknowledged that ChatGPT offered several prospects in a variety of fields, careful thought was required in its treatment and use to avoid possible dangers, such as academic integrity and safety concerns. Finally, numerous open issues were explored in light of ChatGPT's probable future developments.

1.2. Review on the Improvements on ChatGPT

Several researchers contributed to improve the efficiency of the system. Jules White et al. contributed by establishing a framework for describing prompt patterns, enabling easier adaptation across many domains [10]. The outputs of LLMs conversations were improved, showcasing the creation of prompts by combining different patterns. The objective of the project was to enhance the utilization of LLMs in automating processes related to software development. Xiao Liu et al. [11] presented P-Tuning, an innovative method aimed at improving natural language understanding (NLU) in pretrained language models. P-Tuning utilized continuous embeddings to decrease performance instability. The empirical findings provided evidence of its efficacy in stabilizing training across different discrete prompts and substantially enhancing performance on several natural language understanding (NLU) tasks, such as LAMA and SuperGLUE.

1.3. Problem Definition

An attempt was made to summarize a research paper by providing a URL. The screenshot of the response from ChatGPT is given in Figure 1. It is evident that it fails to summarize the research paper given as a URL.

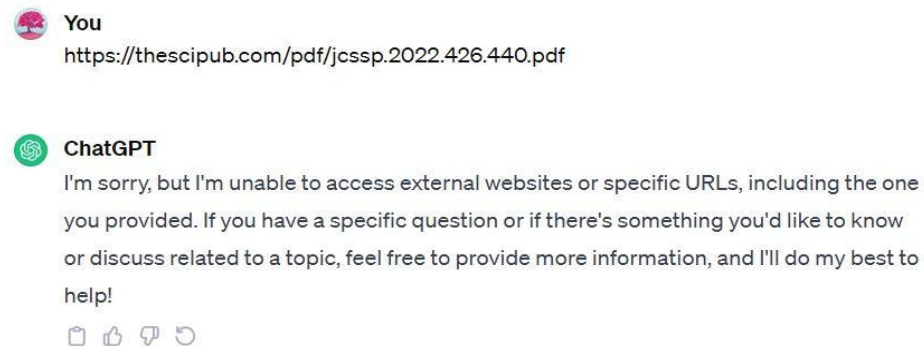


Figure 1. ChatGPT's response to URL.

Researchers and academics depend on remaining up-to-date with the newest breakthroughs in their field. However, the large quantity of published research makes it difficult to comprehensively review every paper. Concise summaries are essential for users to efficiently review the literature and identify the most important and relevant publications. These succinct briefings are crucial not only for staying updated on current advancements but also for finding new research prospects. Researchers can identify gaps in the literature and determine topics that require more exploration by providing a concise summary of previous studies. Furthermore, researchers and academics often require the ability to communicate the fundamental aspects of their research to many audiences, encompassing speeches, grant submissions, and journal articles. Well-crafted summaries are essential tools for effectively presenting difficult research findings to a wider audience in such cases. Hence, a software tool was designed and developed to address text summarization using ChatGPT, provided the URL of the research paper is given as input.

2. Methodology

The methodology for text summarization is given as a flowchart in Figure 2. The URL of the pdf is given as input. When the download button is pressed, the paper is downloaded. There are two methods by which text summarization takes place. In method 1, the pdf is read and the contents are copied into ChatGPT. Further, a prompt is given to summarize the text. In method 2, using the chrome browser ASKYOURPDF plug-in is installed. When the pdf is uploaded, a unique id is generated. This id is given to ChatGPT and an appropriate prompt is given as input to get the summarized text.

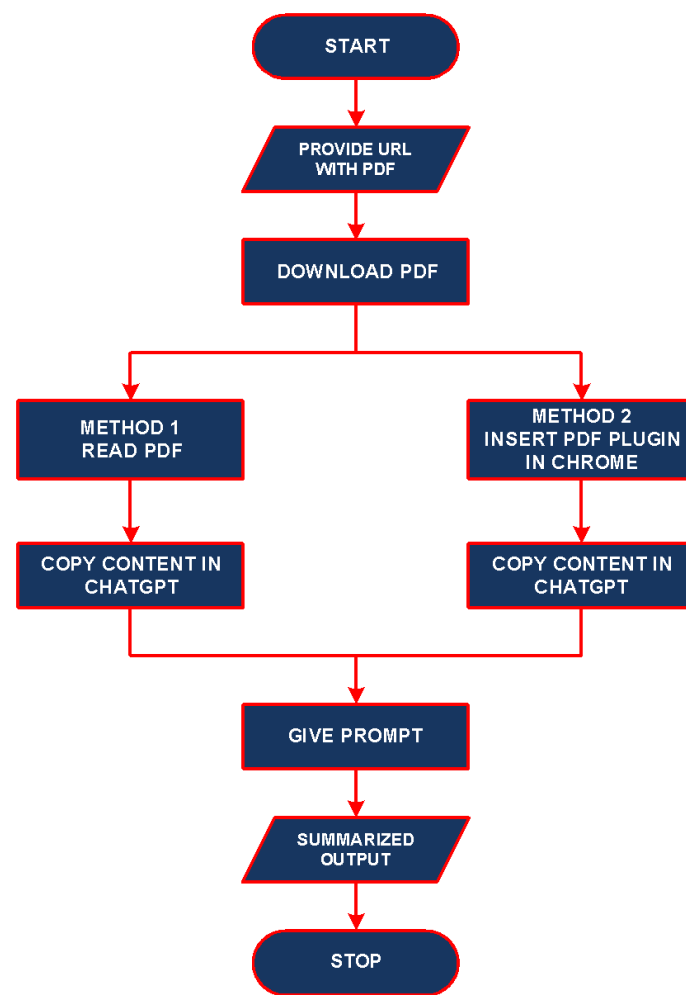


Figure 2. Text summarization methods.

3. Results and Conclusions

The developed system is tested using both of the methods. In method 1, where read, copy, and paste are applied, the output is better. While using the plug-in, a lot of content is missed, making it unreliable. In this paper, the problem of a URL-based summarizer is addressed. As a future work, the system will be tweaked to obtain more accurate output. Our future work is to focus on developing a lossless content summarizer.

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