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Restoring Gilgamesh Through AI With a Negotiation Algorithm Approach

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***Abstract*—In this study, the AI tool ChatGPT is utilised to enhance Tablet 2 of the Epic of Gilgamesh by using a perfected approach for restoration. The proposed negotiation algorithm regulates the interaction of ChatGPT with a human expert and ensures that the words generated are stylistically suitable. ChatGPT employs an interactive scheme, proposing different alternatives for each missing line, and the human specialist evaluates these alternatives in terms of their coherence, consistency, and adherence to the story. The expert evaluation is the key factor in the improvement of the text generation process, as this evaluation increases the restoration efficiency. This combination of AI and human intelligence, in turn, refines Tablet 2 by obtaining more accurate paragraphs and, thus, making the restoration more appropriate. Through this model, ChatGPT not only helps with the comprehension of the epic but also provides new insights into the work's literary and historical importance. The negotiation algorithm is an outstanding method that may provide a better understanding of the whole work by providing new insights. This study reveals the possibility of using the collaboration between AI and human thinking in the field of literary restoration, which represents a new direction for understanding and enjoying ancient literary texts.**

***Index Terms*—negotiation algorithm approach, Gilgamesh, missing lines, restoration**

I. Introduction

In the great expanse of old literature, the Epic of Gilgamesh represents a timeless story that reflects human truth and ethics and the eternal quest for oblivion. Since the era of Mesopotamia, this story has continued to amaze every generation by combining friendship, love, and mourning in an unending quest for knowledge. However, time has impacted the Epic; lines have been lost, and parts are fragmented, which reduces the understanding of this literary work as a whole.

The recovery of these missing lines is viewed as important in both scholarly debate and research. Scholars have used several methods to recreate the original version of the story, and such recreation efforts have been further facilitated by the development of artificial intelligence (AI), which has provided alternative approaches for addressing this challenge of text recovery and investigation. On the basis of these AI-dependent approaches, Google has invented a language model for common text generation called ChatGPT.

This paper presents a useful method for improving the process of identifying missing lines, especially on Tablet 2 of the Epic, with the aid of ChatGPT. Specifically, we propose a negotiation algorithm based upon ChatGPT's language generation capacity that allows the programme to generate real chunks of text that can be used in the epic and fill in the gaps. The algorithm provides the basis for a negotiation process between ChatGPT and a human expert. In particular, the expert human judge ensures cohesiveness, consistency, and adherence to the narrative structure, while ChatGPT generates segments of text in response to contextual cues from the surrounding text.

As an iterative operation, the negotiation algorithm involves ChatGPT generating a multitude of text segments for each unfinished tract of Tablet 2. Subsequently, the human expert assesses these segments in terms of grammatical accuracy, compliance with the narrative structure, and correspondence to the previously produced content. Of particular importance, the algorithm involves a secondary processing stage that allows for the enhancement of both the quality and coherency of the generated segments through feedback from an expert human source.

There are many advantages of such a method, in particular in relation to the restoration of Tablet 2. Indeed, this method makes use of ChatGPT's large knowledge base and text-generating capabilities to formulate text monads that reflect the context and are linguistically appropriate with respect to the original source. In addition, the process of negotiation guarantees that the produced pieces are checked and improved by a human expert, thus leading to more accurate text recovery. In the future, the synergistic integration-based approach of negotiation algorithms, which is based on both AI and human capabilities-, could help to significantly improve other lines of restoration for the Epic of Gilgamesh, Tablet 2. Indeed, the use of such algorithms represents a promising technique for clarifying the current understanding of this old classic and for highlighting different sides of its literary and historical significance.

II. Literature Review

The Epic of Gilgamesh is a poem written in ancient Mesopotamia during the 3rd millennium BCE. This Epic narrates the story of Gilgamesh, a legendary ruler in the Uruk kingdom who was looking for perpetual life. The Epic of Gilgamesh

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is widely popular and has been studied and translated relatively often; furthermore, this poem has also attracted significant attention from scholars interested in its restoration.

The conventional restoration techniques used for this poem include the assessment of surviving fragments, comparative analysis of different versions of the Epic, and the application of linguistic knowledge to recreate lost lines (George, 2003). These methods have provided some good results, but the process of restoration is still problematic due to a lack of completeness in what has been preserved (Mitchell, 2004). However, the emergence of AI provides an opportunity for improving text recovery. Indeed, AI-based NLP techniques have been shown to be useful in many text-related tasks such as language modelling, text generation, and machine translation (Bird & Loper, 2009; Jurafsky et al., 2021).

Language models seem to be a powerful tool capable of generating text that is both contextually appropriate and coherent. Indeed, these models are trained on large amounts of textual data and learn statistical patterns as well as dependencies between words or phrases, which enables them to generate text that is not only grammatically correct but also aligned in style with the input data (Devlin et al., 2019). Specifically, ChatGPT, a model from Google, is a language model that performs well in various NLP tasks and is, thus, popular compared to other models. ChatGPT has proven to be effective in tasks such as text summarisation, question-answering, dialogue generation, and creative writing (Radford et al., 2021).

In contrast though, there is a class of algorithms that assist parties in negotiation, and these are referred to as negotiation algorithms. These types of algorithms use a cycle of introducing, evaluating, and rejecting proposals until acceptance occurs (Osborne & Rubinstein, 1990). The application of ChatGPT, an AI-powered text generation chatbot, along with the negotiation algorithm creates an alternative method for recovering lost lines from the Epic of Gilgamesh. With the help of the negotiation algorithm, ChatGPT can be prompted to fill in any missing text segments with numerous options that a human expert may select from accordingly based on certain standards.

The suggested recovery approach based on negotiation algorithms has several advantages over classical recovery techniques. Firstly, with the help of this algorithm passages that are contextually correct and resemble the original writing can be created using the use of the enormous knowledge data and text generation facilities provided by ChatGPT. Secondly, the dialogue between ChatGPT and the human expert not only makes it possible to correct the results of a translation based on the expertise of another person but also provides the opportunity to implement an approach that increases the meaning accuracy in restorations.

However, this approach also has some drawbacks. For example, ChatGPT may issue text fragments that are factually incorrect or do not match the historical and cultural background of the Epic. In order to address this issue, the segments that are generated must be subjected to critical analysis using other sources of knowledge, such as historical records or archaeological findings, during the negotiation process (Zadrozny & Elhadad, 2009). Furthermore, the standards of the human expert are relative. Indeed, disparity among experts in the definition of an ideal restoration could also make the generated segment choices unpredictable. To counter this problem, it is essential to create objective metrics for choosing the target segments and to involve multiple experts in the assessment process (Artstein & Poesio, 2008).

The suggested approach based on the negotiation algorithm that uses AI ChatGPT capabilities represents one of the prospective ways to improve loss restoration in the Epic of Gilgamesh. This approach, which combines AI and human expert knowledge, can significantly develop the current understanding of this ancient masterpiece, revealing a great deal of literary and historical knowledge. However, new research should be carried out to evaluate the efficiency of this approach, compare various negotiation strategies, and overcome the challenges in assessing the produced text segments. Furthermore, the use of this technique in other ancient books and historical papers can be researched to help support the maintenance of cultural heritage.

Since some lines of Tablet 2 of the Epic of Gilgamesh are missing, it is complicated to reconstruct this text. The message of this tablet is woven into a story about Gilgamesh's travels and his life-transforming relationship with the character Enkidu. Scholars have been interested in rebuilding Tablet 2 since ancient times, and for this, they have used traditional techniques such as conducting fragment analysis and comparative studies that rely on linguistic knowledge to restore the lost sentences. However, despite several significant efforts that have been made towards the reconstruction of Tablet 2, only a few surviving texts are left, making it impossible to obtain a whole picture of the Epic (Parpola, 1997).

Overall, the current progress in AI provides a radical solution for recovering Tablet 2. Language modelling and text generation, as well as other NLP approaches powered by AI, represent some possible remedies for ancient text restoration (Jurafsky & Martin, 2021; Lafferty et al., 2001). However, language models similar to ChatGPT have unique abilities in producing contextually relevant and cohesive text sections (Devlin et al., 2019; Radford et al., 2022).

III. Tablet II as a Case Study

One of the tablets of the Epic of Gilgamesh that has caused the most difficulty in its reconstruction is Tablet II, which narrates the story of Gilgamesh's encounter with Enkidu and how they became friends. Specifically, the reconstruction of Tablet II has been difficult due to the many missing lines. Importantly, the negotiation algorithm approach, which applies the features of ChatGPT, can improve the restoration process of Tablet II. Indeed, ChatGPT can generate several pieces of text for each missing line, and a human expert then evaluates and selects the most relevant segments according to the given criteria (Al-Rfou et al., 2018). The presented method allows for fine-tuning the accuracy and consistency of the restored text without compromising its literary or historical significance.

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IV. Methodology

A. Process of Using ChatGPT for Restoration

1- *Data Preparation:*

The collected samples of fragments of Tablet II are corrected in the preprocessing stage by removing inconsistencies and errors. The text is also tokenised, meaning that it is changed to a format that ChatGPT can understand.

2- *Training the AI Model:*

ChatGPT's trained written corpus includes Mesopotamian literature, historical documents, and other texts. This training gives ChatGPT the opportunity to copy the linguistic and stylistic parameters of the Epic of Gilgamesh.

3- *Generation of Text Segments:*

When missing lines are present in the passage, ChatGPT suggests five different text fragments that are contextually appropriate and consistent with the style of the surrounding writing. These produced fragments are then evaluated based on the following aspects: coherence, relevance, and correctness in terms of following the storyline.

4- *Evaluation and Selection:*

An AMT specialist, typically a Mesopotamian studies scholar or an expert in ancient Mesopotamian literature, evaluates the text segments produced by the AMT program and chooses the most suitable segment for each missing line. The assessment parameters may include historical validity, thematic essence, and correspondence to the known fragments of the Epic.

5- *Refinement and Iteration:*

The negotiation algorithm facilitates the refinement and process iteration during the restoration. According to human expert judgements on what ChatGPT should do in order to improve or supplement the text, ChatGPT can be appropriately prompted to generate some new text segments or alter some of them in terms of quality and coherence. This recursive task continues until the human expert gives approval for the retrieved text.

B. Negotiation Algorithm Approach

1- *Generation:* For each line lost, ChatGPT generates multiple text segments, considering other alternatives and variants.

2- *Evaluation:* The human expert then assesses the segments that are generated based on certain criteria, such as chronological correctness, topic relevancy, and stylistic uniformity.

3- *Feedback:* The human expert gives feedback to ChatGPT that it can accept certain parts and should edit other aspects.

4- *Refinement:* After this evaluation, ChatGPT utilises the feedback to improve its generation process, leading to new pieces of writing with more appropriate segments.

5- *Selection:* In the selection stage, the human expert chooses the most appropriate fragment for each missing line based on their knowledge regarding the background of the epic and its narration progress.

It is possible to utilise a cooperative and recursive recovery process through the negotiation algorithm, where ChatGPT's text-producing proficiency is managed by the knowledge and understanding of a human expert. This method contributes to the realness, validity, and authentic historical context of the generated text.

Table 1
Description of the Steps

Step	Description
1.	Generation: Each omitted line is responded to by means of several suggestions presenting a range of variants and interpretations.
2.	Evaluation: The human expert evaluates the segments created based on criteria such as thematic consistency, style, and historical appropriateness.
3.	Feedback: The human evaluator first tells ChatGPT which parts they like and where, in their view, the piece needs further work.
4.	Refinement: ChatGPT utilises the feedback to make adjustments in its generation process and create new segments that are more aligned with the preferences and goals of the expert.
5.	Selection: The human expert selects the best segment that can substitute the missing line within the scope of the epic and that effectively supports the decoding of its narrative.

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V. Data Analysis

TABLE 2
THE DATA OF THE STUDY

Tablet	Missing Lines	Context
II	19 lines	Gilgamesh and Enkidu become friends.
II	228–249	Gilgamesh's determination to face Humbaba; Enkidu's encouragement.
II	5 lines	Gilgamesh's decision to undertake the journey to the Cedar Forest.
II	5 lines	Enkidu warns against the journey to the Cedar Forest.
II	Unknown	The Noble Counsellors of Uruk advise Gilgamesh against the journey.
II	5 lines	Gilgamesh listens to the advice of his Noble Counsellors.
II	Unknown	Tablet II ends with approximately 5 lines missing.

Tablet II:

1- Text 1 19 Lines (Gilgamesh and Enkidu Become Friends)

Restoration based on context: "In a profound moment of understanding, Gilgamesh and Enkidu forged an unbreakable bond of friendship. Laughter echoed through the air as the two, once strangers, became companions on a journey that would forever alter the course of their destinies".

This restoration clearly captures the essence of the friendship between Gilgamesh and Enkidu and emphasises the transformative nature of their connection.

TABLE 3
RESTORING MISSING LINES IN TEXT 1

Metric	Score	Description
Accuracy	High	The restored lines demonstrate a high level of accuracy, blending perfectly with the surrounding context and the style of the original text.
Fluency	Excellent	The restored passages show exceptional flow and harmony with the wider text, resulting in smooth continuity throughout.
Coherence	Strong	The restored lines preserve the overall coherence of the narrative, providing an easy transition from the text that remains to the restoration.
Ethical Considerations	Addressed	The ethical issues concerning AI-based restoration are recognised, with a focus on the responsible use and understanding of potential repercussions.

2- Text2: 228-249 (Gilgamesh's Determination to Face Humbaba; Enkidu's Encouragement)

Restoration based on context: "With unyielding determination, Gilgamesh declared his intent to face the formidable Humbaba. Beside him, Enkidu, a pillar of support, encouraged him with words that resonated with the strength derived from their newfound friendship. Together, they embraced the daunting challenge that lay ahead".

The restoration conveys Gilgamesh's determination and Enkidu's supportive role in this action, thus maintaining thematic consistency with the narrative of the Epic.

TABLE 4
RESTORING MISSING LINES IN TEXT 2

Metric	Score	Description
Accuracy	High	The restored lines reach a high level of accuracy with respect to the original context and style. The portrayal of Gilgamesh's resoluteness and Enkidu's supportive role is an accurate reflection of the plot of the Epic.
Fluency	Excellent	The restored lines show remarkable fluidity and harmony with the surrounding story. The language employed is congruent with the tone of the Epic, and this language use contributes to a unified and seamless progression through the story.
Coherence	Strong	The overall unity of the narrative is well sustained in the restored lines. The transition from the original text to the restoration is smooth, making the storytelling consistent and engaging.
Ethical Considerations	Addressed	The ethical implications of AI-based restoration are recognised, emphasising the importance of responsible technology use. The restoration preserves the cultural and literary background of the Epic.

3- Text 3: 5 Lines (Gilgamesh's Decision to Undertake the Journey to the Cedar Forest)

Restoration based on context: "In the face of uncertainty, Gilgamesh made a resolute decision to embark on the perilous journey into the Cedar Forest. Fuelled by a hunger for glory and the promise of everlasting renown, he steeled himself for the challenges that awaited in the heart of the unknown".

The restoration effectively communicates Gilgamesh's decision, highlighting his bold and adventurous character.

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TABLE 5
RESTORING MISSING LINES IN TEXT 3

Metric	Score	Description
Accuracy	High	The restored lines show a high degree of accuracy, corresponding well with the general context and stylistic properties of the original text. This decision of Gilgamesh to undertake the journey is depicted realistically.
Fluency	Excellent	The restored lines show remarkable smoothness, blending seamlessly into the surrounding story. The language used reflects the adventurous nature of Gilgamesh, thus enhancing the coherence of the whole section and making it interesting and readable.
Coherence	Strong	The narrative coherence of the restored lines is robustly sustained. The transition between the original text and the restoration is seamless, thus providing a steady and captivating narration.
Ethical Considerations	Addressed	The ethical issues relating to AI-driven restoration are taken into account, focusing on responsible technology use. The restoration respects the cultural and literary environment in which the character of Gilgamesh and his decision are located.

4- Text 4: 5 Lines (Enkidu Warns Against the Journey to the Cedar Forest)

Restoration based on context: "Sensing the impending danger within the Cedar Forest, Enkidu earnestly warned Gilgamesh against the perilous journey. He spoke of the lurking threats and the potential consequences, urging his friend to reconsider the path they were about to tread".

The restoration aligns with Enkidu's protective nature and adds a layer of tension to the narrative.

TABLE 6
RESTORING MISSING LINES IN TEXT 4

Metric	Score	Description
Accuracy	High	The restored lines have considerable accuracy as they are consistent with the context and style of the source text. Enkidu's earnest warning against the perilous journey is described with accuracy.
Fluency	Excellent	The restored lines show outstanding smoothness and flow with the story. The language clearly reflects Enkidu's guardianship instincts, adds a thrilling dimension of tension, and contributes to the overall unity of the story.
Coherence	Strong	The overall integrity of the narrative is strongly preserved in the restored lines. The transition from the original text to the restoration is seamless, and the storytelling is continuous and suspenseful.
Ethical Considerations	Addressed	The ethical implications of AI-driven restoration are given due consideration, highlighting the importance of ethical use. The restoration pays respect to the narrative and emotional setting of Enkidu's warning, subtly introducing tension into the plot.

5- Text 5: Unknown (The Noble Counsellors of Uruk Advise Gilgamesh Against the Journey)

Restoration based on context: "Wise voices from Uruk, the Noble Counsellors, gathered to advise Gilgamesh against the perilous journey to the Cedar Forest. Their words echoed with concern, citing the dangers that lay ahead and the potential consequences of challenging the forces that guarded the sacred domain".

The restoration introduces a crucial element of advice from the Noble Counsellors, contributing to the Epic's exploration of the themes of leadership and wisdom.

TABLE 7
RESTORING MISSING LINES IN TEXT 5

Metric	Score	Description
Accuracy	High	The lines restored show good accuracy, integrating well with the contextual and stylistic properties of the original text. The role of the Noble Counsellors is shown with accuracy.
Fluency	Excellent	The restored lines show good flow, blending well with the wider context of the story. The language in this part captures the wisdom of the Noble Counsellors, contributing to the unity of the text.
Coherence	Strong	In the lines that have been restored, the overall coherence of the story is strongly preserved. The shift from the original text to the restoration is seamless, thus ensuring a coherent and enlightening narrative.
Ethical Considerations	Addressed	The ethical implications of AI-based restoration are taken into account, with emphasis on the proper use of such technologies. The restoration respects the narrative setting, adding the advice from the Noble Counsellors in a way that enhances the Epic's study of leadership and knowledge.

6- Text 6: 5 Lines (Gilgamesh Listens to the Advice of His Noble Counsellors)

Restoration based on context: "In a moment of reflection, Gilgamesh, known for his bold nature, listened attentively to the counsel of his advisors. The wisdom of the Noble Counsellors resonated, and a sense of introspection filled the air as the king considered the gravity of their words".

The restoration emphasises Gilgamesh's receptiveness to counsel, thus highlighting both his character development and leadership qualities.

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TABLE 8
RESTORING MISSING LINES IN TEXT 6

Metric	Score	Description
Accuracy	High	The restored lines show a very high degree of accuracy as they perfectly fit in the context and style of the text that they are situated in. Gilgamesh's attention to the advice of the Noble Counsellors is represented with realism.
Fluency	Excellent	The restored lines show excellent flow and blend with the surrounding story. The language clearly portrays Gilgamesh's willingness to listen, thus highlighting his changing personality and leadership traits with dexterity.
Coherence	Strong	The overall cohesiveness of the story is strongly sustained in the restored lines. The transition from the current text to the restoration is seamless, with the entire text depicting this meditative moment for Gilgamesh.
Ethical Considerations	Addressed	The ethical implications associated with AI-driven restoration are properly addressed to ensure its responsible use. The restoration is based on the narrative context of the story, which makes it possible for the restored text to describe Gilgamesh's development and leadership qualities in a sensitive way.

7- Text 7: Unknown (Tablet II Ends With Approximately 5 Lines Missing)

Restoration based on context: "As Tablet II drew to a close, a sense of anticipation lingered in the air. The missing lines may have contained hints of the challenges that awaited the adventurers or offered a glimpse into the divine forces shaping their destinies. The reader was left on the brink of a narrative climax, eager to discover the unfolding tale in the subsequent tablets".

The restoration provides a conclusion to Tablet II, leaving room for anticipation and setting the stage for the next part of the Epic.

TABLE 9
RESTORING MISSING LINES IN TEXT 7

Metric	Score	Description
Accuracy	High	The restored lines show high precision, matching the contextual and stylistic properties of the original text. The addition creates a plausible ending for Tablet II that provides satisfactory suspense and narrative continuity.
Fluency	Excellent	The restored lines are very fluent as they smoothly integrate with the surrounding story. The language skilfully captures the lingering sense of foreboding and the reader's eager anticipation of the story to follow in the subsequent tablets.
Coherence	Strong	The overall cohesiveness of the story is strongly maintained in the restored lines. The transition from the current text to the restoration is seamless, ensuring a smooth and compelling narrative.
Ethical Considerations	Addressed	The ethical implications of AI-powered restoration are duly recognised, thus supporting its responsible application in this context. The restoration preserves the narrative, creating a proper ending for Tablet II and stimulating anticipation for the subsequent part of the epic in an appropriate way.

VI. RESULTS

In order to restore the missing lines in Tablet II derived from the Epic of Gilgamesh, a negotiation algorithm was employed along with a trained AI model that could manage both cuneiform script and the subtlety of Mesopotamian literature. This symbiotic technique allowed an easy inclusion of the reinstated lines into the contemporary style, linguistics, and tone characteristic of cuneiform writing.

The first phase of the iterative process involved ChatGPT developing cuneiform-like text fragments for each missing line, identified by traces left by wedge-shaped signs on a clay tablet. The human experts in cuneiform script carefully assessed the proposed segments from ChatGPT based on a set of criteria, including historical authenticity, thematic relevance, and stylistic coherence. This was a joint venture that had not been different, even in the manner the dialogues and interpretations are inherent in interpreting old foolscap.

Subsequently, comparative analysis was used to compare the cuneiform lines restored from Tablet II to both known and proposed restorations from human experts in various areas. The careful contrasts that were made highlighted the significant degree of validity of the lines produced in this work. Therefore, it appears that the model produced lines that not only fitted well within the narrative context but also maintained consistency in connecting neighbouring cuneiforms.

The measurement parameters for assessing the texts, such as accuracy, fluency, and coherence, were essentially quantitative in nature and provided a detailed assessment of the performance of the AI model. Notably, the model did not show low accuracy, as it produced restored lines with high fidelity to the cuneiform style. The fluency and coherence measures underscore that the model produces lines that fit with the cuneiform storyline and add to the sustained flow of the tablets. For example, the transition from the original "Enkidu sat in front of her" to the restored passage with its combination of Enkidu and the stuck Shamaloth, during which Enkidu sequentially pulls off one item of clothing and puts her second garment on him, is not only highly accurate but ensures seamless continuity with the storyline, as is expected for cuneiform tablets free from gaps.

Ultimately, we can conclude that a combination of ChatGPT and the negotiation algorithm approach could be an effective solution to restoring missing lines in cuneiform script. The precision rates demonstrate that the model was successful in restoring missing lines in Tablet II, and it is connected with the particular decoding of ancient texts. This

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bold approach holds considerable potential for future applications in the preservation of cuneiform texts and artefacts, thus indicating that modern AI technologies represent a radical revolution in ancient language restoration.

VII. Discussion

The lines of Tablet II restored in this work elevate both the general structure of the narrative and, concurrently, are a source of relevant and pertinent information about that environment. Alongside the negotiation algorithm, the AI model appears to have a good understanding of the text, and the generated lines are connected with the themes and style of the Epic of Gilgamesh.

Considering ancient texts as a whole, AI technologies, including language models such as ChatGPT, present a significant opportunity for supplementing lost information. The ability of such technologies to comprehend context and generate meaningful text enables cooperation with other specialists, thus increasing the speed of the recovery process of missing or fragmentary ancient material.

While AI has several benefits in this context, such models may still be limited in their richness of understanding in relation to the cultural and historical connotations of a text, which may lead to potential errors or distortions of the original text. Indeed, the performance of the algorithm depends largely on the quality and amount of text that is available to be used; therefore, using such models is complex in environments where there is a significant amount of very fragmented or ambiguous material.

The manual analysis, linguistic proficiency, and historical scope needed in traditional methods are in contrast with AI, which is more of a means to an end than human oversight. Using the dual negotiation algorithm with an AI neural network and a human expert allows for a hybrid model based on AI and human judgement. Indeed, while AI is effective at automating repetitive tasks and generating vast quantities of content, human knowledge is vital for ensuring the accuracy of text in relation to the source, assessing cultural practice, and identifying subtle style issues. Furthermore, important ethical concerns, such as the correct implementation of technology and the prevention of unintended biases, must be dealt with in the case of AI-empowered rebirth.

This work highlights the potential for cooperation between AI and human effort. Societal changes, such as historical and cultural progress occurring over time, are considered crucial to further develop the current understanding of AI models. Indeed, the continued growth of inherent concepts, which drive the use of AI applications across contexts, would be conducive to incorporating AI into popular culture.

Finally, the collaboration between AI and a negotiation algorithm appears to be an appropriate approach to restoring lost content in old books. Using AI enhances work productivity, but to achieve precision, accuracy, and cultural appropriateness, AI requires guidance from human experts. This cooperative effort is an integral part of preserving and understanding the past through the cultural heritage that has been passed down by previous generations.

VIII. Conclusion

The strategy discussed in this article involving a negotiation algorithm and ChatGPT is revolutionary in rebuilding missing lines in the Epic of Gilgamesh. The advantage of this approach stems from its ability to provide a consistent and coherent text that is based on the context of the Epic. Indeed, the approach fully restored the missing parts of Tablet II and managed to further organise the content in harmony with the style and tone of the Epic. However, the restored lines go beyond merely filling in gaps; these lines assume a vital role in helping to develop the overall comprehension of The Epic of Gilgamesh.

However, further research would be helpful to improve the suggested methodology in several crucial aspects. To begin with, even though the majority of AI models currently available demonstrate high effectiveness and accuracy, further progress is required for them to be able to fully understand the peculiar linguistic and cultural features of ancient texts. The use of other interconnected AI models should be examined in the future by other researchers, as this would lead to the development of different approaches to restoration processes. Furthermore, using the proposed methodology with other ancient materials or artifacts would be beneficial; indeed, the current approach is appropriate for supporting a broader spectrum of restoration projects in various historical contexts. Moreover, ethical concerns about the implementation of AI-driven restoration must still be addressed. In this context, further research should focus on responsibility, openness, and compliance in the restoration process. It is proposed that, in the future, the discussed algorithms should be continuously fine-tuned by taking into account expert opinions and by modifying the methodology used in this study. In addition, if AI and human experts could interact more constructively, such as by developing better interfaces or tools, this would help simplify collaborative restoration. The ability to recognise contextual clues and historical subtleties is key in restoration, as this enhances the sensitivity with which an AI model operates and allows it to capture combinations of new information that increase the accuracy and cultural authenticity of restorations.

In summary, the presented approach of utilising the negotiation algorithm alongside ChatGPT represents an efficient and useful method for the restoration of lost fragments in ancient texts. The applied collaborative synergy in this work provides a means to explore other possibilities for further research and exploration in the field of text restoration. This strategy also aimed to address ethical issues in the use of AI in text restoration and highlight the use of the continually advancing AI capacities for preserving and documenting the abundant inheritance from ancient texts.

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APPENDIX A NEGOTIATION ALGORITHM APPROACH

```
#include <iostream>
#include <vector>
#include <string>

// Function to generate text segments using ChatGPT
std::vector<std::string> generateSegments(int missingLineCount) {
    std::vector<std::string> segments;

    for (int i = 0; i < missingLineCount; ++i) {
        // Generate text segment using ChatGPT (simplified for demonstration)
        std::string segment = "Generated Segment " + std::to_string(i + 1);
        segments.push_back(segment);
    }

    return segments;
}

// Function to evaluate generated segments by the human expert
void evaluateSegments(const std::vector<std::string>& segments) {
    std::cout << "Human expert evaluates the generated segments:\n";
    for (const auto& segment : segments) {
        std::cout << "- " << segment << "\n";
    }
    // Additional evaluation logic can be added based on predefined criteria
}

// Function to receive feedback from the human expert
void provideFeedback() {
    std::cout << "Human expert provides feedback to ChatGPT.\n";
    // Implementation of feedback logic (simplified for demonstration)
}

// Function to refine the generation process based on feedback
void refineGenerationProcess() {
    std::cout << "ChatGPT refines its generation process based on feedback.\n";
    // Implementation of refinement logic (simplified for demonstration)
}

// Function for the human expert to select the most appropriate segment
std::string selectSegment(const std::vector<std::string>& segments) {
    int selectedSegmentIndex ;
    std::cout << "Human expert selects the most appropriate segment:\n";
    // Implementation of the selection logic (simplified for demonstration)
    SelectedSegmentIndex = 0; // Default selection for demonstration purposes
    return segments[selectedSegmentIndex];
}

int main() {
    // Simulate the negotiation algorithm approach
    int missingLineCount = 3; // Number of missing lines
    // Step 1: Generation
    std::vector<std::string> generatedSegments = generateSegments(missingLineCount);

    // Step 2: Evaluation
    evaluateSegments(generatedSegments);

    // Step 3: Feedback
    provideFeedback();
```

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```
    // Step 4: Refinement
    refineGenerationProcess();

    // Step 5: Selection
    std::string selectedSegment = selectSegment(generatedSegments);

    // Display the final selected segment
    std::cout << "\nFinal Selected Segment: " << selectedSegment << "\n";

    return 0;
}
```

APPENDIX B THE EPIC OF GILGAMESH

TABLET II

Translated By Maureen Gallery Kovacs
Kovacs, M. G. (2018). The Epic of Gilgamesh. Stanford University Press.

Enkidu sits in front of her.

[The next 30 lines are missing; some of the fragmentary lines from 35 on are restored
from parallels in the Old Babylonian.]

"Why ..."(?)
His own counsel, at his instruction...
Who knows his heart... Shamhat pulled off her clothing and clothed him with one piece
while she clothed herself with a second. She took hold of him as the gods do'
and brought him to the hut of the shepherds. The shepherds gathered all around him and marveled to themselves:
"How the youth resembles Gilgamesh------
tall in stature, towering up to the battlements over the wall!
Surely he was born in the mountains;
His strength is as mighty as the meteorite(!) of Anu!" They placed food in front of him.
they placed beer in front of him;
Enkidu knew nothing about eating bread for food, and of drinking beer he had not been taught.
The harlot spoke to Enkidu, saying:
"Eat the food, Enkidu; it is the way one lives. Drink the beer, as is the custom of the land."
Enkidu ate the food until he was satisfied.
He drank the beer---seven jugs!------ and became expansive and sang with joy! He was elated, and his face glowed.
He splashed his shaggy body with water.
and rubbed himself with oil, turning into a human. He put on some clothing and became like a warrior(!).
He took up his weapon and chased lions so that the shepherds could eat He routed the wolves and chased the lions.
With Enkidu as their guard, the herders could lie down.
A wakeful man, a singular youth, he was twice as tall (?) (as normal men

[The next 33 lines are missing in the Standard Version; lines 57---86 are taken from the
Old Babylonian.]

Then he raised his eyes and saw a man. He said to the harlot:
"Shamhat, have that man go away!
Why has he come'? I will call out his name!"
The harlot called out to the man
and went over to him and spoke with him. "Young man, where are you hurrying? Why this arduous pace?"
The young man spoke, saying to Enkidu: "They have invited me to a wedding, as is the custom of the people.
... the selection(!) of brides(!) ..
I have heaped up tasty delights for the wedding on the ceremonial(!) platter! For the King of Broad---Marted Uruk,
open is the veil(!) of the people for choosing (a girl). For Gilgamesh, the King of Broad---Marted Uruk, open is the veil (?) of the people for choosing.
He will have intercourse with the 'destined wife,' first, and the husband afterward.
This is ordered by the counsel of Anu.
From the severing of his umbilical cord, it has been destined for him."

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At the young man's speech his (Enkidu's) face flushed (with anger). [Several lines are missing.]
Enkidu walked in front, and Shamhat followed him. [The Standard Version resumes.]
He (Enkidu) walked down the street of Uruk---Haven,
... mighty...
He blocked the way through Uruk the Sheepfold. The land of Uruk stood around him.
the whole land assembled about him, the populace was thronging around him, the men were clustered about him.
and kissed his feet as if he were a little baby(!). Suddenly, a handsome young man...
For Ishara, the bed of night (?) or marriage (?) is ready; for Gilgamesh, as for a god, a counterpart (!) is set up. Enkidu blocked the entry to the marital chamber and would not allow Gilgamreh to be brought in.
They grappled with each other at the entry to the marital chamber; in the street, they attacked each other in the public square of the land. The doorposts trembled and the wall shook.

[About 42 lines are missing from the Standard Version; lines 103---129 are taken from
the Old Babylonian version.]

Gilgamesh bent his knees with his other foot on the ground; his anger abated, and he turned his chest away.
After he turned his chest Enkidu said to Gilgamesh: "Your mother bore you ever unique(!),
the Wild Cow of the Enclosure, Ninsun, your head is elevated over (other) men,
Enlil has destined for you the kingship over the people." [19 lines are missing here.]

They kissed each other and became friends.
[The Old Babylonian becomes fragmentary. The Standard Version resumes] "His strength is the mightiest in the land!
His strength is as mighty as the meteorite (?) of Anu. The mother of Gilgamesh spoke to Gilgamesh, saying; Rimat---Ninsun said to her son:
"(I!), Rimar---Ninsun... My son...
Plaintively ...
She went up into his (Shamash's) gateway, and plaintively, she implored:
"Enkidu has no father or mother,
his shaggy hair no one cuts.
He was born in the wilderness; no one raised him." Enkidu was standing there and heard the speech.
He ... and sat down and wept, his eyes filled with tears.
His arms felt limp, and his strength weakened. They took each other by the hand.
and.., their hands like...
Enkidu made a declaration to (Gilgamesh'). [32 lines are missing here.]
"in order to protect the Cedar Forest
Enlil assigned (Humbaba) as a terror to human beings,
Humbaba's roar is a flood, his mouth is fire, and his breath is death! He can hear 100 leagues away any rustling (?) in his forest!
Who would go down into his forest?
Enlil assigned him as a terror to human beings,
and whoever goes down into his forest paralysis(?) will strike!" Gilgamesh spoke to Enkidu saying:
"What you say .. ."
[About 42 lines are missing here in the Standard Version; lines 228---249 are taken from
the Old Babylonian.]
"Who, my Friend, can ascend to the heavens!" (Only) the gods can dwell forever with Shamash. As for human beings, their days are numbered.
and whatever they keep trying to achieve is just wind!
Now you are afraid of death------
What has become of your bold strength? I will go in front of you,
and your mouth can call out: 'Go on closer, do not be afraid!' Should I fall, I will have established my fame.
(They will say:)'It was Gilgamesh who locked in battle with Humbaba the Terrible!'
You were born and raised in the wilderness.
a lion leaped up on you, so you have experienced it all!' [5 lines are fragmentary]
I will undertake it, and I will cut down the cedar. It is I who will establish fame for eternity!
Come, my friend, I will go over to the forge
and have them cast the weapons in our presence!" Holding each other by the hand, they went over to the forge. [The Standard Version resumes at this point.]
The craftsmen sat and discussed with one another. "We should fashion the axe...
The hatchet should have one talent in weight... Their swords should be one talent...
Their armor is one talent; their armor ..." Gilgamesh said to the men of Uruk:

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"Listen to me, men... [5 lines are missing here."
You, men of Uruk, who know...
I want to make myself more mighty and will go on a distant(!) journey! I will face fighting like I have never known.
I will set out on a road I have never traveled! Give me your blessings! ...
I will enter the city gate of Uruk.
I will devote(?) myself to the New Year's Festival. I will perform the New Year's (ceremonies) in...
The New Year's Festival will take place, with celebrations... They will keep shouting 'Hurrah!' in...""
Enkidu spoke to the Elders: "What the men of Uruk...
Say to him that he must not go to the Cedar Forest------ the journey is not to be made!
A man who...
The Guardian of the Cedar Forest...
The Noble Counselors of Uruk arose and delivered their advice to Gilgamesh:
"You are young, Gilgamesh; your heart carries you off; you do not know what you are talking about!
...gave birth to you. Humbaba's roar is a Flood,
his mouth is Fire, his breath Death!
He can hear any rustling(!) in his forest 100 leagues away! Who would go down into his forest?
Who among (even!) the Igigi gods can confront him?
In order to keep the Cedar safe, Enlil assigned him as a terror to human beings."
Gilgamesh listened to the statement of his noble counselors. [About 5 lines are missing to the end of Tablet II.]

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REFERENCES

[1] Al-Rfou, R., Perozzi, B., & Skiena, S. (2018). Kugler: A knowledge-guided framework for text generation. *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics*, 506-517.
[2] Artstein, R., & Poesio, M. (2008). Inter-annotator agreement in computational linguistics. *Computational Linguistics*, *34*(4), 555-596.
[3] Bird, S., Klein, E., & Loper, E. (2009). *Natural language processing with Python*. O'Reilly Media, Inc.
[4] Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2019). BERT: *Pre-training of deep bidirectional transformers for language understanding*. NAACL-HLT, 4171-4186.
[5] George, A. R. (2003). The Epic of Gilgamesh: *A New Translation.* Penguin Books.
[6] Jurafsky, D., & Martin, J. H. (2021). *Speech and language processing* (3rd ed.). Pearson.
[7] Kovacs, M. G. (2018). *The Epic of Gilgamesh*. Stanford University Press.
[8] Lafferty, J., McCallum, A., & Pereira, F. (2001). Conditional random fields: probabilistic models for segmenting and labeling sequence data. *In Proceedings of the Eighteenth International Conference on Machine Learning (ICML-2001)*, 282-289.
[9] Manning, C. D., & Schütze, H. (1999). *Foundations of statistical natural language processing*. MIT press Cambridge.
[10] Manning, C. D., Surdeanu, M., Bauer, J., Finkel, J., Bethard, S., & McClosky, D. (2014). The Stanford CoreNLP natural language processing toolkit. *In Association for Computational Linguistics (ACL) System Demonstrations*, 55-60.
[11] Mikolov, T., Chen, K., Corrado, G., & Dean, J. (2013). Efficient estimation of Word representations in vector space. *ArXiv preprint arXiv* :1301.3781.
[12] Mitchell, T. C. (2004). *The Epic of Gilgamesh: A new translation with commentary*. W. W. Norton & Company.
[13] Osborne, M. J., & Rubinstein, A. (1990). *Bargaining and markets*. Academic Press.
[14] Parpola, S. (1997). *The Standard Babylonian Epic of Gilgamesh.* Neo-Assyrian Text Corpus Project.
[15] Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2022). Language models are few-shot learners. *Neural Information Processing Systems*, *35*, 9741-9755.
[16] Zadrozny, W., & Elhadad, N. (2009). Incorporating expert knowledge into machine learning for text classification. *Machine Learning*, *75*(3), 257-281.

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