Print ISSN: 2791-2248
Online ISSN: 2791-2256
مَجلّةُ تَسْنِيمِ الدَولِيّة
للعُلومِ الإنسانيّةِ والاجتمَاعيّةِ والقانونيّةِ

العدد الثاني عشر – اذار – 2025 / March

Contemporary Linguistic Methodologies in Analyzing Literature: Exploring New Dimensions of Language, Culture and the Impact of AI

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Abstract. The advent of AI has introduced a transformative approach to the study of literature and it has created novel horizons in relation to cultural, linguistic and literary analysis. AI technology is often contrasted to traditional literary methodologies such a close reading and textual analysis. AI technology allows profound examinations of themes, motifs, symbols, and narrative, linguistic, and structural patterns in literary texts in speed that could transcend even the most discerning readers and critics. Techniques such as Machine Learning and Natural Language Processing NLP allow us to dig deep into subtle textual issues that might have even been overlooked by critics and readers**.** The previous claims will appear to be facts for unexperienced students of literature. AI is indeed productive since it allows rapid analysis of vast data basis and it exhibits consistency in the detection of literary patterns. It also exhibits relative objectivity in specifying themes and patterns. Contemporary students of literature have the advantage of benefiting from AI tools such as text miming, sentiment analysis, and other tools like those PYTHON employs. However, employing AI technology makes it obligatory to discuss issues of talent, creativity, individual privacy, cultural difference, authenticity, authorship, ethics, intellectual integrity, and other relevant concepts. This research explores the potential of AI in the literary arena and provides examples how it is used in an attempt to

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shed light on the advantages and limitations of employing AI technology in literary and linguistic analysis.

1. Chapter One

1.1. Introduction

Undoubtedly, IA has revolutionized all fields of knowledge and humanities are no exception. Digital Humanities DH is now a rising field that attracts the attention of numerous scholars. New technologies are now being used to approach literary texts, technologies that allow scholars to assess texts in speed and precision they never imagined possible. AI has sparked a controversy in the field; some say it is now indispensable while the majority of scholars remain skeptic of its use. Computational techniques like text mining and sentiment analysis are now being used to approach literary texts. Text mining is actually useful in extracting patterns and structures from texts. This tool uses techniques such as frequency analysis, topic modeling and named entity recognition to extract information from given data. It can be used to specify symbols, themes, motifs, and patterns in literary texts. Sentiment analysis tools, on the other hand, allow us to quantify the emotional structures in given textual data, and they can be used to specify the emotional tones of texts as well as the emotional beings of characters.

Many scholars believe that these tools threaten to replace traditional literary methodologies such as close reading and textual analysis. This paper explores these techniques and tries to discuss their potentials and limitations in the field. Marquez`s Chronicle of a Death Foretold is discussed as a case study to investigate the possibilities of AI tools in literary criticism.

1.2. Research Problem

With the ushering innovative use of AI technology, controversies of academic ethics such as authenticity, authorship, cultural subtleties, and individual talent and privacy are now urgently raised. Traditional literary and linguistic approaches are interwoven with concepts of ideology, human biases, and individual creative interpretation, all of which seem to be irrelevant when it comes to AI, since AI technology is claimed to possess utmost objectivity and comprehensiveness. Is AI really objective? Is it not limited with the quality and the quantity of the data upon which its algorithms process any given text? Can it really surpass and replace human talent as many are now arguing?

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Cannot it be manipulated? The demarcating line between efficient use of AI technology on the one hand and the ethics of the field on the other seems vague and undetermined yet. These are the foci of discussion in this research.

1.3. Research Importance

AI technology now adays is not simply useful but it has become necessary in various academic fields, including the critical one. Hence academic research must necessarily examine the ethics, the constraints, and the reliability of AI technology in the midst of the current hype that celebrates AI technology.

1.4. Research objectives

The paper sheds light on how AI technology approaches literary texts, exploring its limitations and advantages in the field of literary, linguistic and cultural analysis. The paper focuses on two AI tools, namely text miming and sentimental analysis, and investigates the possibilities and limitations of these tool in approaching Marquez`s Chronicle of Death Foretold. The paper also sheds light on the points where AI and critical schools intersect.

2. Chapter Two: Text Mining in Literary Analysis

2.1. Definition and Literature Review

Text Mining is an AI tool that is used to extract information from texts. It can be used in the critical field to spot patterns, structures, themes, symbols, and motifs in literary texts. There are three major techniques involved in this tool which are frequency analysis, topic modeling and named entity recognition. Frequency analysis can be used to specify the occurrence of certain words or phrases in a text. Topic modeling, on the other hand, can reveal themes through analyzing clusters of words that occur together frequently in a text. Furthermore, named entity recognition can classify people, places, and events within a text. Scholars can use these techniques to explore sets of given texts and to uncover similarities, differences and connections between them. These techniques are useful since they offer to locate connections or shifts that might be unnoticed by scholars. The tools can be used to analyze individual texts as well.

Matthew Jocker is one of the early researchers to apply text mining to literary texts. His book Macroanalysis: Digital Methods and Literary History is essential for researchers in the field. His work tries to explore the shifts in

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stylistic and thematic features in the history of literature. Using text mining can be promising for Jocker because

Text mining allows us to see patterns that are invisible to the naked eye, patterns that are hidden in the larger scales of literary history. It helps us to move beyond the anecdotal and the particular to see the general and the systematic. (25)

Similarly, Franco Moretti, a prominent DH researcher, experimented with applying textual mining and sentiment analysis to studying the narrative plots and the emotional patterns that are found in the 19th century British novels. He used frequency analysis and topic modeling to explore literary genres and historical shifts. His studies spotted the changes in using language across different periods, such as word frequency, sentence length and stylistic complexity. He introduced his concept of 'distant reading' to specify overarching patterns in literary texts. The idea refers to how scholars can read data and patterns not individual texts. Text Mining, for him, allows to understand literary history through aggregate information and quantitative analysis.

2.2. Case Study: Chronicle of a Death Foretold

Set in a small town in Latin America, Chronicle is a story about the tragic death of a young man, Santiago Nassr, for being accused of taking Angela Vicario`s virginity. On his wedding night, the groom discovers that his bride is not a virgin, and so he returns her home. Her butcher brothers, who are Nasar`s friends, ask her who the man was, and she says it was Nasar. The brothers, compelled by honor not personal enmity, declare that they are going to kill the man. The entire town knows about their murder plan, but tragically the town people fail to warn Nasar or to stop the murder. The two men find themselves compelled to butcher him like a pig in front of the entire townspeople. No one knows if Santiago really took the girl`s virginity and the issue becomes eventually irrelevant. Years later, Santiago`s friend, a journalist, revisits his town and interviews the town people in an attempt to understand the murder. The journalist, who narrates the story, tries to remain detached as possible and to give an objective account of the murder in a journalistic manner. In their testimonies to the narrator, the townspeople, who fail in saving Nasar and in understanding his absurd death, seem to have suffered long enough from collective guilt. In an attempt to shirk responsibility, they all blame fate, stressing that his death was simply inevitable. Skillfully, Marquez introduces themes of fate, guilt, scapegoating, honor, and festivity within the text. Text

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Mining techniques can be employed to investigate how these themes are woven into the narrative.

2.3. Frequency Analysis

Scholars can use frequency analysis to spot terms that are indicative of death and murder in the text. They can, for instance, use Python programs to generate word clouds that can visually highlight recurring words related to death. The word "kill" recurs over sixty times in the text, while the word "death" recurs almost thirty times. These techniques go beyond simple word count, as they allow us to understand how Marquez uses a repetitive pattern to create a pervasive sense of doom in the text. This high frequency creates the impression that Nasar dies each time the words 'death' and 'kill' are mentioned. He is killed over and over again in the narrative. Using additional tools for frequency distribution allows us to understand the context through which Marquez builds up the plot that leads to the tragic end of the story.

2.4. Topic Modeling

Topic Modeling is a technique used in Natural Language Processing: "Topic Modeling is the new revolution in text mining. It is a substantial technique for revealing the underlying semantic structure in large collection of documents." (Pooja and Poonam, 1) In the literary arena, topic modeling allows us to discover how themes are created in texts by spotting words that are collocated to create them. Using this technique in analyzing Chronicle identifies, for instance, connections between words that are associated with honor, violence, and gender roles. Consider the butterfly symbolism in the two extracts from the novel:

In the course of the investigations for this chronicle I recovered numerous marginal experiences, among them the free recollections of Bayardo San Roman's sisters, whose velvet dresses with great butterfly wings pinned to their backs with gold brooches drew more attention than the plumed hat and row of war medals worn by their father. (26)

"All right, girl," he said to her, trembling with rage, "tell us who it was."

She only took the time necessary to say the name. She looked for it in the shadows, she found it at first sight among the many, many easily confused names from this world and the other, and she nailed it to the wall with her well-aimed dart, like a butterfly with no will whose sentence has always been written.

"Santiago Nasar," she said. (28)

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The connection between women and butterflies is suggestive of fragility and of societal roles and images women are expected to abide by. The two texts reveal that women in the town live in the shadow of ruling violent patriarchs. The butterflies are pinned to the girls` backs; Angela will be pinned by the darts or knives of her brothers unless she confesses a name; She pins Santiago when she says his name; Santiago is also pinned by the brothers who slaughter him with their knives like a pig; The brothers are pinned too because their lives are ruined after the crime. It is worth mentioning that the killers felt afraid when they killed Nasar because he looked bigger when he died. These connections do not simply reflect women`s helplessness in a typical rural patriarchal society, but it further extends the idea of victimization. Women and men are alike, being helpless victims of cultural norms such as honor, and societal values and expectations make human life, both male and female, insignificant as a butterfly`s or a pig`s. The animal imagery (the butterfly, the pig, the bull) that keeps emerging in the text contributes to emphasize how people become victims to societal expectations. Frequency analysis, topic modeling, and named entity recognition tools prove helpful to spot such subtle connections in the narrative.

2.5. Potentials and limitations of Text Mining in literary analysis

Text Mining is beneficial for allowing scholars to assess numerous texts and to uncover patterns that might otherwise go unnoticed. However, one of its limitations is its intensive reliance on context sensitive algorithms. Another drawback is that frequency analysis and topic modeling fail to detect literary nuances such as irony, metaphors and cultural-specific allusions, elements that are essential for a profound interpretation of texts. These tools, useful as they are, cannot replace the interpretive effort required by the critic

While text mining can reveal broad patterns and trends, it is not a substitute for deep, contextual analysis. The algorithms we use can identify patterns, but they do not understand nuance, irony, or the rich contextual layers of literary meaning from scholars. (Jocker 2009, 64)

3. Chapter Three: Sentiment Analysis in Literary Analysis

3.1. Definition and literary review

Sentiment Analysis (SA), also known as opinion mining, is an AI technique that is also applied to literary texts. It is the study that analyzes "people`s opinions, sentiments, appraises, attitudes, and emotions towards entities and

their attributes" (Liu, 1). SA was originally used to classify emotional responses as positive or negative, and it is widely used to measure emotional responses of social media users. However, SA is used in the literary field for more complex objectives. SA extracts the emotional content of texts and thus is applied to measure and classify the emotional spaces in literary texts, including the tone of the text and the shifting emotional responses of its characters towards the events and other characters. SA tools have become significant because they focus on contribution of emotional structures to the creation of meaning in literary texts, an aspect that was marginalized in structuralist and post-structuralist methods that focused on the impact of narrative techniques and structures on the interpretation of texts. Six major SA tools are now being used in the literary arena, including Syuzhet, VADER, SentiArt, SÉANCE, Stanford SA, and Transformers Pipelines.

In "Sentiment Analysis in Literary Studies: A Critical Survey", Simone Rebora presents an illuminating review of the experiments conducted using SA in the field. The most important ones are:

1- Franco Moretti (2011) experimented with applying SA to studying narrative plots, primarily to explore the emotional patterns that are found in the 19th- century British novels. Interestingly, he points out that these novels share common emotional structures, such as the features of emotional peaks and melancholic valleys.
2- Papp-Zipemovsky (2021) used SA tools to study poetry from a neurocognitive perspective.
3- Jockers (2015) and Reagan et al. (2016), using SA tools, concluded that the story arcs of the Western literary production are dominated by six basic shapes.
4- Andre Piper (2016) used SA tools to study the emotional shifts in the German novels during different historical periods. His study spotted the generally negative mood in the texts during periods of upheaval and war.
5- Hogan (2011) used SA tools to explore narratological treatments of emotion in literary texts.
6- Saif Mohammad (2013) used SA to examine the emotional spaces in Shakespeare`s plays.

Kim and Klinger distinguish five main fields of SA application in the literary field:

1. Classification of literary texts in terms of the emotions they convey
2. Genre and story-type classification
3. Modeling sentiments and emotions in texts from previous centuries

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4. Character network analysis based on emotional relations
5. Miscellaneous and more general applications

3.2. Can SA models be applied to explore complex texts like Marquez`s?

It is challenging to apply SA tools to emotionally intricate texts like Chronicle. The emotional structure of the text is built on the tension between the ostensibly objective journalistic style on the one hand, and the emotional intensity that threatens to disrupt this objectivity on the other. Complex feelings of guilt, blame, indifference, satisfaction, and resentment are hidden under the seemingly objective testimonies of the characters, but a sense of emotional intensity threatens to erupt, especially when the narrative reaches the scene of killing Nasar. The dispassionate tone with which the story is told does not indicate a lack of sentiment in the text. SA tools are unable to detect this subtle tension between objectivity and intensity, and hence they are unreliable to interpret the emotional landscape of the novel. The text is so dense with irony, metaphor and cultural-specific references that SA algorithms fail to interpret correctly. For instance, the townspeople`s passive complicity to the crime is masked by the sense of normalcy with which they recount the events. SA algorithms fail to spot the dark irony in this contrast. The algorithms interpret the witnesses` neutral recounting of events as absence of emotion thus missing the underlying critique of the community's moral complacency.

Another limitation of using SA tools to approach the text is that they fail to recognize the Latin American cultural-specific references that are embedded in the text. Notions of honor and shame, for instance, cannot be appropriately processed by SA algorithms, and hence the failure to interpret the significance of these notions to the creation of the emotional landscape in the text. SA tools oversimplify emotional responses to basic categories (fear, anger, sadness, etc.) and thus fail to grasp the emotional complexity of the text.

3.3. Literary Perspective

SA tools are criticized because they are reductionist; they reduce intricate emotions to algorithmic outputs and thus depersonalize and dehumanize the interpretative process of literature. When used, they will remain a supplement, not a replacement, for human interpretative efforts. SA tools should always be integrated into a broader interpretative context. It is best to conclude this chapter with the words of Matthew Jocker on the limitations of using SA in literary analysis

Sentiment analysis offers a powerful set of tools for analyzing text, but it is limited in its ability to interpret the complex and often subtle emotional layers found in literary works. The algorithms used in sentiment analysis typically operate on predefined lists of words and simple categorizations, which can fail to capture the full range of emotions and their contextual meanings in literary texts. (2024, 102)

4. Chapter Four: AI and Literary Theory

4.1. Intersections of AI and Literary Theory

Applying AI tools to literary analysis has introduced notable intersections with literary theory. AI tools have created possibilities that both challenge and supplement the frameworks of traditional literary theory. AI tools, for instance, are appealing to structuralists, but are rejected by post-colonialists. This chapter examines possible intersections between AI tools and traditional literary theory.

4.2. AI and Structuralist and Post-structuralist Thought:

The structuralists sought to uncover the underlying patterns that govern narrative in general, such as archetypes, universal motifs, and binary oppositions. Their work focuses on spotting common ground for all texts rather than analyzing individual ones. This effort, which culminated in the rise of narratology, might be similar to the logic with which modern DH scholars approach texts. We already referred to scholars who tried to identify governing patterns in large volumes of data, and notions like Moretti`s 'distant reading' seem to be aligned with structuralist thought. For instance, text mining could prove useful in spotting underlying binary oppositions in Chronicle, such as honor vs. shame, fate vs. free will, and public vs. private morality. Quantifying these binaries using frequency analysis and topic modeling allows us to understand how Marquez builds his narrative upon these oppositions. Interpreting the meaning through textual relationships and oppositions is in line with the structuralist idea that meaning is relational in literature.

On the contrary, post-structuralism rejects the structuralist quest to identify fixed patterns that create meaning in texts; post-structuralism highlights the fluidity of meaning and interpretation. Post-structuralist thought rejects the fixed meaning that the pre-programmed algorithms would generate from texts like Chronicle because these meanings are not originally inherent in the text but imposed on it by AI tools.

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4.3. AI tools and Postcolonial Theory

Postcolonial theory highlights the significance of the cultural context to the understanding of literary texts. Elements such as colonial history and cultural hybridity should be considered when approaching Latin American texts like Chronicle, elements which AI tools fail to grasp. These texts incorporate cultural aspects that surpass the rational western categorization of things as either 'real' or 'magical'. Applying AI tools raises questions about the cultural assumptions that are embedded in these tools. Sentiment Analysis tools, for instance, are trained on data that reflect Western assumption, and therefore they fail in capturing the nuances and culturally-specific elements that are essential to the interpretation of the text. AI tools are not programmed to process the text within its cultural context and therefore they tend to oversimplify its meaning. Another postcolonial criticism of using AI tools is that these tools potentially impose cultural assumptions, typically western, on texts from different cultural backgrounds. It is necessary to develop culturally sensitive AI tools to approach non-Western literary texts.

5. Chapter Five: Reflections on Ethical Considerations in Applying AI Tools

5.1. Authority and Interpretation

AI tools threaten to limit the diversity of critical perspectives in interpreting literary texts. Instead of opening new horizons, these tools threaten to narrow perspective if they were to become the dominant methods in interpreting texts. The tools are neither innocent nor objective as their algorithms are trained to process data according to a given perspective.

5.2. Originality and Authorship

AI tools are now used not simply to interpret texts but further to write them. Questions about authorship and originality become urgent and up till now, there are no clearly cut constraints that govern the methods of their use.

5.3. Cultural and Ideological Bias:

A serious ethical concern regarding the use of AI tools is related to the potential for cultural and even ideological bias. The data on which AI algorithms are trained reflects cultural and ideological biases, even though they create the false impression of Cultural and ideological neutrality. These algorithms are programmed by people who belong to specific cultural and

ideological backgrounds. AI tools should be culturally sensitive, a matter that is still far from being resolved.

5.4. Conclusion

A systematic application of AI tools in the literary theory is still in the process of formation. Text Mining and Sentiment Analysis tools are now being applied and they seem promising because they are uncovering new avenues in interpreting literature. As AI advances, new and more sophisticated tools that can address the nuances of literature and the various cultural contexts of its production and reception will certainly emerge. Scholars need to be trained in using these new tools for the matter. The challenges we face in applying them today will certainly be overcome only to face new ones in the future.

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