Research on the Application of Artificial Intelligence Technology in Editing and Proofreading: Postprint

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Abstract

[Objective] This study aims to investigate the application of artificial intelligence technology in editorial proofreading work, particularly its effectiveness in terminology matching and contextual correlation analysis. [Methods] By analyzing the practical application of big data, cloud computing, and artificial intelligence algorithms in text processing, this research focuses on the specific implementation of precise terminology database invocation and semantic proofreading in the editorial process. [Results] The research demonstrates that artificial intelligence can achieve precise terminology matching in the editorial proofreading process, improve the accuracy and consistency of textual content, and effectively ensure that publication content complies with relevant laws, regulations, and political orientation requirements. [Conclusion] The application of artificial intelligence technology in editorial proofreading not only improves editorial efficiency but also ensures the legality and political compliance of publications, holding significant practical application value. Editorial staff should ensure the accuracy of terminology matching by strengthening the dynamic updating and maintenance of terminology databases, while simultaneously optimizing semantic proofreading through the utilization of contextual correlation analysis models to enhance the consistency and accuracy of texts.

Full Text

Research on the Application of Artificial Intelligence Technology in Editing and Proofreading Work

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Abstract

[**Objective**] This study aims to investigate the application of artificial intelligence technology in editing and proofreading work, particularly its effectiveness in terminology matching and contextual association analysis.

[**Method**] By analyzing the practical application of big data, cloud computing, and AI algorithms in text processing, this research focuses on the specific implementation of precise terminology database retrieval and semantic proofreading in the editorial process.

[**Results**] The study demonstrates that AI can achieve precise terminology matching during editing and proofreading, improve the accuracy and consistency of textual content, and effectively ensure that publications comply with relevant laws, regulations, and political orientation requirements.

[**Conclusion**] The application of AI technology in editing and proofreading not only enhances editorial efficiency but also ensures the legality and political compliance of publications, holding significant practical value. Editors should strengthen the dynamic updating and maintenance of terminology databases to ensure precise terminology matching, while simultaneously leveraging contextual association analysis models to further optimize semantic proofreading and enhance textual consistency and accuracy.

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1. Concept and Development Trends of Artificial Intelligence Technology

Artificial intelligence (AI) refers to the simulation and extension of human intelligence, enabling computers or machines to possess capabilities such as perception, reasoning, learning, and decision-making. According to the definition by the American Association for Artificial Intelligence (AAAI), AI enables computers to perform tasks that typically require human intelligence, such as language understanding, visual recognition, and problem-solving. Key AI technologies include machine learning, deep learning, natural language processing (NLP), and computer vision, with the core objective of using data and algorithms to allow machines to learn from experience and optimize decision-making, thereby achieving superhuman intelligent performance across multiple domains [1].

The development of AI technology has undergone several stages. In 1956, AI formally emerged as an academic field, primarily employing rule-based symbolic methods. In the 1980s, expert systems enabled AI to achieve application progress in specific domains. After 2006, breakthroughs in deep learning technology facilitated rapid advancement in AI applications for speech recognition, image processing, and natural language understanding. By 2020, AI applications had expanded to emerging industries such as autonomous driving, smart healthcare, and intelligent manufacturing, with continuously evolving technological maturity and application scenarios.

Currently, the integration of AI with big data, cloud computing, blockchain, and virtual reality (VR) is driving AI toward greater efficiency and intelligence. First, the combination of AI and big data enables machines to process and analyze massive datasets, uncovering latent patterns and achieving precise predictions. Second, cloud computing provides powerful computational resources and storage capacity, supporting AI model training and real-time deployment, thereby enhancing the efficiency and scalability of large-scale AI applications. The fusion of AI and blockchain offers higher security and transparency for data processing, particularly in finance and supply chain domains, where their integration can improve automation and smart contract execution efficiency. Additionally, the combination of AI and VR technology makes virtual reality experiences more intelligently perceptive and interactive, enhancing immersion and user experience.

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2. Professional Skills Required for Editing and Proofreading Work

2.1 Correct Political Orientation Political orientation literacy refers to the ability of editorial staff to accurately grasp and implement national policies, laws, and regulations during editing and proofreading, ensuring that publication content aligns with correct political direction and value orientation. This competency serves as an important guarantee for editors to ensure the legality and social impact of publications [2].

First, editors must possess keen political awareness and the ability to correctly identify ideological orientation issues in manuscripts. This includes recognizing and avoiding sensitive content related to ethnicity, religion, national security, and territorial integrity. Editors must be familiar with relevant regulations such as the *Regulations on the Administration of Publishing* and the *National Security Law of the People' s Republic of China* to ensure manuscript content does not violate national laws or propagate erroneous ideologies.

Second, editors should have the capacity to identify content involving state secrets or confidentiality breaches [3]. According to the *Law of the People' s Republic of China on the Protection of State Secrets*, editors must strictly review manuscripts to ensure they do not contain any information that could leak state secrets [4].

Third, editors must also be vigilant about content prohibited by national laws and regulations. Under the *Copyright Law of the People' s Republic of China*, editors should ensure manuscripts do not infringe upon others' copyrights or contain false or misleading advertising content [5]. Editors must also comply with the *Regulations on the Administration of Online Publishing Services* to ensure digital publication content is healthy and lawful [6].

Fourth, editors should continuously monitor changes in national policies and updates to industry regulations, adjusting editorial strategies accordingly. Through relevant training and learning, editors can continuously enhance their political literacy and legal awareness, ensuring publications maintain correct political orientation.

2.2 Fidelity to Original Manuscripts Fidelity to original manuscripts is a core professional skill in editing and proofreading, fundamentally ensuring that editors and proofreaders can accurately understand and remain faithful to the content, intent, and style of the original text. First, fidelity requires comprehensive and in-depth comprehension of the original manuscript. Editors and proofreaders must accurately grasp the text' s theme, logical structure, and core arguments, ensuring that modifications do not alter the author' s original intent [7]. For example, when proofreading academic papers, editors must ensure that all research data, citations, and conclusions remain consistent with the author's original presentation; any modifications should aim to enhance clarity and standardization rather than change academic viewpoints or research findings.

Second, fidelity emphasizes respect for the author' s linguistic style and expression habits. When processing texts, editors and proofreaders should preserve the author' s lexical characteristics, sentence structures, and narrative style. For instance, in editing literary works, editors should avoid excessive modification of the author' s personalized expressions to prevent weakening the work' s uniqueness and artistic appeal. Furthermore, fidelity demands that editors and proofreaders possess a strong sense of responsibility and meticulous work attitude [8]. They must maintain reverence for the original manuscript throughout the process, ensuring every modification is carefully considered to avoid introducing errors or deviations through negligence.

2.3 Technical Application Capability Technical application capability refers to editors' ability to effectively utilize modern technological tools and software to enhance work efficiency and quality [9]. First, editors must be proficient in electronic text processing tools, which not only provide basic editing functions but also incorporate spell-checking and grammar-proofing features to help editors quickly identify and correct errors.

Second, editors should possess the ability to use professional typesetting software to ensure publications' visual professionalism and aesthetic quality. Simultaneously, editors need to understand basic HTML and CSS knowledge to

facilitate content formatting and style adjustments in digital publications for multi-platform distribution.

Third, editors must be familiar with Content Management Systems (CMS). CMS enables editors to efficiently manage, update, and publish digital content, supporting version control and multi-platform synchronization to ensure information accuracy and consistency.

Fourth, editors should pay attention to and master emerging technologies, such as AI-assisted proofreading tools [10]. These tools, through natural language processing technology, can automatically detect grammatical errors, logical issues, and inconsistencies in texts, further enhancing proofreading efficiency and quality.

2.4 Professional Knowledge Reserve Professional knowledge reserve refers to the accumulation of knowledge and professional competence related to language, disciplinary fields, and publishing standards that editors possess during editing and proofreading. This reserve forms the foundation for editors to complete their work efficiently and directly impacts publication quality and professionalism [11].

First, editors must possess solid language proficiency, including precise mastery of grammatical, rhetorical, and punctuation elements, as well as sensitivity to different writing styles and genres. Editors should accurately identify and correct linguistic errors to ensure clear, accurate, and fluent expression.

Second, editors should have specialized knowledge in relevant disciplines. For example, in scientific publishing, editors need to understand basic scientific principles and technical terminology; in literary publishing, they should be familiar with literary theory and critical methods. Editors also require interdisciplinary knowledge to handle manuscripts involving multiple fields with ease [12].

Third, editors must be familiar with publishing industry norms and standards, including publishing ethics and typesetting specifications. Editors should ensure publications comply with industry standards in content, format, and legal compliance to avoid potential legal risks. Simultaneously, editors need to master every stage of the publishing process, from manuscript receipt to final publication, ensuring smooth execution at each step.

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3. Research on the Application of AI Technology in Editing and Proofreading

3.1 Grammar Correction: Intelligent Identification and Revision In practical editing and proofreading work, editors utilize AI technology, particularly grammar correction tools based on natural language processing (NLP) and deep learning algorithms, to effectively enhance proofreading efficiency and accuracy [13]. During operation, editors first upload the manuscript to an AI

grammar correction platform, which automatically scans the entire text and flags potential grammatical errors. Based on these annotations, editors review and confirm revision suggestions one by one, ensuring precise handling of every linguistic issue.

Additionally, AI grammar correction tools can assist editors in identifying subject-verb agreement problems [14]. When processing sentences such as "The company' s decision-making level is meeting to discuss new development directions," the AI system automatically detects the mismatch between "discuss" and "decision-making level," providing suggestions like " 'Decision-making level' is a plural subject; the verb should use the plural form of 'discuss,' " enabling editors to make necessary adjustments. This precise intelligent identification allows editors to concentrate on more complex editorial tasks rather than analyzing grammar word by word. Another important function of AI grammar correction tools is identifying and revising redundant expressions.

3.2 Semantic Proofreading: Contextual Association Analysis Semantic proofreading through contextual association analysis ensures the logical consistency and coherence of article content. Artificial intelligence, particularly ChatGPT based on natural language processing technology, helps editors identify and correct potential logical inconsistencies or unclear expressions by deeply understanding and reasoning about semantic relationships in texts [15].

Specifically, editors can use ChatGPT' s contextual analysis function to identify contradictions or inconsistencies in the article' s context. Beyond single-sentence analysis, editors can also utilize ChatGPT to review logical relationships between paragraphs. When AI detects illogical causal relationships, editors can judge and revise these based on system feedback to ensure content rationality. Furthermore, editors can use ChatGPT to identify repetitive expressions or ambiguous wording [16]. Through contextual analysis, AI helps editors discover repeated background information across different paragraphs or sentences, suggesting simplification or consolidation. Based on this feedback, editors remove redundant parts to optimize conciseness and precision. ChatGPT can also help editors determine the appropriateness of certain words or phrases, particularly when inaccurate lexical choices may appear in specific contexts.

3.3 Typesetting Optimization: Automatic Format Adjustment In editing and proofreading, typesetting optimization through AI technology enables automatic format adjustment, significantly improving efficiency and ensuring compliance with standards [17]. After importing a document into an AI typesetting system, the system automatically identifies document structure and adjusts text, paragraphs, headings, and graphic elements according to preset rules, reducing manual intervention.

Editors first use AI tools to check document headings. AI automatically detects font type, size, color, and spacing between headings and body text to ensure compliance with specified format requirements. For paragraph spacing,

AI automatically optimizes white space between paragraphs based on document structure to ensure neither too tight nor too loose layout. Editors review the adjusted effects to ensure visual and typesetting compliance.

In text typesetting, editors use AI to automatically adjust lists, numbering, and citation formats. AI can automatically identify list items in the text and adjust numbering according to predetermined rules, unifying styles and avoiding tedious manual adjustments. In graphic typesetting, editors can use AI technology to automatically optimize image and chart positioning and sizing. AI automatically identifies graphic relationships and intelligently adjusts chart or picture placement according to article content, ensuring appropriate arrangement with related text and adjusting spacing to avoid crowding or incoordination. If AI finds inappropriate image dimensions, it automatically adjusts image size according to typesetting style to ensure proper placement. In practice, office software such as WPS Office and Microsoft Word have integrated AI typesetting optimization functions (see Figure 1). When editors use these features, AI automatically aligns all elements on the page, adjusting paragraph indentation and margins to further enhance document consistency.

[Figure 1: see original paper] AI Typesetting Diagram

3.4 Terminology Matching: Intelligent Database Precision Retrieval
With the development of AI technology, particularly the application of big data and cloud computing, terminology matching and intelligent database precision retrieval provide effective support for editing and proofreading. By leveraging AI technology, editors can quickly and accurately identify and match specialized terminology, improving editorial efficiency and content quality. AI technology first extracts terminology from massive domain literature through big data analysis and machine learning, continuously updating terminology databases. By constructing terminology databases based on industry, discipline, and political orientation requirements, AI systems ensure editors select accurate terminology. For example, in the legal field, AI technology can automatically identify specialized terminology by comparing legal documents and related cases, ensuring correct usage across different contexts. During editing, AI systems provide real-time prompts and proofreading for terminology use, automatically recommending terms that comply with documentation and legal standards, thereby improving editorial efficiency (see Table 1).

Cloud computing provides robust support for real-time updates of intelligent terminology databases. Editors need not worry about database obsolescence, as cloud computing ensures dynamic updating, allowing editors constant access to the latest terminology versions. For example, when processing technically complex medical literature, AI continuously learns new developments in the medical field, automatically updating medical terminology and adjusting lexical precision matching based on context. Cloud computing' s advantage lies in supporting cross-platform work, enabling editors to collaborate across multiple devices, proofread terminology in real time, and ensure document consistency.

Additionally, AI can automatically compare terminology' s political compliance through embedded regulatory databases during editing, ensuring publication content does not violate relevant legal policies and maintains correct political orientation.

Terminology Summary Table

Terminology Category	AI Application	Effect
Legal terminology (e.g., "contract breach"), Medical terminology (e.g., "surgical incision")	AI extracts from terminology database to ensure consistent and accurate usage	Ensures consistency and professionalism of terminology
Politically sensitive terminology related to national security and ethnic issues (e.g., "separatism")	Compares against political regulation database, automatically flags sensitive terminology	Ensures publications comply with correct political direction and legal requirements
Emerging field terminology (AI, green building, etc.)	Dynamically updates terminology database to follow latest industry developments	Maintains timeliness and forward-looking nature of terminology

4. Problems and Optimization Recommendations

4.1 Existing Problems From a technical perspective, current AI applications in editing and proofreading still face algorithmic limitations. Despite significant progress in natural language processing, AI systems' ability to understand complex contexts remains insufficient, particularly when handling polysemy in specialized terminology or cultural background differences, which often leads to misjudgment. For example, certain professional terms may have completely different meanings across disciplinary fields, while existing algorithms often struggle to accurately identify such cross-domain semantic differences. Additionally, deep learning models are heavily dependent on training data, often exhibiting obvious lag when confronted with emerging fields or rapidly developing professional terminology.

At the application level, human-machine collaboration adaptation issues are increasingly prominent. On one hand, over-reliance on AI tools may lead to the

degradation of editors' professional judgment, creating "technology dependence syndrome." On the other hand, AI system interfaces and interaction designs often fail to adequately consider editors' work habits, increasing learning costs and operational burdens. In practice, editors frequently need to switch between multiple systems, and this fragmented workflow severely impacts efficiency. More critically, AI proofreading results lack sufficient interpretability—editors find it difficult to understand the internal logic behind specific modification suggestions, which to some extent undermines trust in the machine.

Institutional challenges are mainly reflected in the absence of standard specifications and ambiguous responsibility delineation. Currently, the industry lacks unified technical standards for AI editing and proofreading, with significant differences in functional implementation and quality control among systems developed by different vendors. Regarding responsibility division, when AI systems make errors, the responsible party is difficult to clearly identify, posing potential risks to publication quality management. Furthermore, data privacy protection mechanisms remain inadequate, particularly when handling confidential or sensitive content—how to ensure data security has become an urgent issue.

4.2 Optimization Recommendations To address technical bottlenecks, it is recommended to build a multi-level algorithm optimization system. The primary task is to develop domain-adaptive semantic understanding models by introducing knowledge graphs and context-aware technologies to enhance systems' precise identification capabilities for specialized terminology. Simultaneously, establish dynamic learning mechanisms enabling AI systems to continuously absorb newly emerging terminology and expressions. In terms of technical architecture, a modular design approach can be adopted to decouple functions such as grammar checking, terminology matching, and format adjustment, facilitating targeted performance optimization.

Regarding application optimization, efforts should focus on building intelligent collaborative work platforms. By integrating various AI tool functions, provide editors with one-stop solutions to avoid frequent system switching. Prioritize improvements in human-computer interaction design, developing intelligent assistance functions that better align with editorial work habits, such as context-related shortcut menus and visual modification suggestion displays. It is recommended to introduce a "human-in-the-loop" mechanism, retaining manual confirmation steps in critical proofreading stages to leverage AI' s efficiency advantages while ensuring professionals maintain final control.

Institutional development requires efforts in both standardization and normalization. It is suggested that industry associations take the lead in formulating AI editing and proofreading technical standards, clarifying system functional requirements, performance indicators, and quality assessment methods. Establish an AI-assisted editing responsibility traceability mechanism through technical means such as operation logs and version control to clearly record the complete human-machine collaboration process. Regarding data security, a hierarchi-

cal authorization access system should be constructed, implementing encrypted storage and transmission for sensitive content with regular security audits. Additionally, it is recommended to establish a dedicated AI editing ethics committee to research and formulate relevant ethical guidelines, guiding the healthy development of technology applications.

In summary, the application of AI technology in editing and proofreading, particularly in terminology matching and semantic proofreading, significantly improves editorial efficiency and accuracy. By combining big data analysis and cloud computing, AI achieves precise terminology retrieval and automated proofreading, effectively reducing human intervention and ensuring publication compliance and professionalism. As AI technology continues to advance, it will play an increasingly critical role in editing and proofreading, driving the intelligent transformation of the publishing industry and further enhancing editorial quality and industry standards.

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Note: Figure translations are in progress. See original paper for figures.