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# Innovative artificial intelligence in philology

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***Abstract.*** *Innovative artificial intelligence is radically changing the methods of work in philology and linguistics. Thanks to the automation of text processing, more accurate machine translation, personalized educational programs and opportunities for deep analysis of language patterns, AI is becoming an integral part of modern research. Its role continues to grow, making linguistic research more efficient, accessible and innovative.*
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**Introduction.** Symbolic and connectionist approaches are two main paradigms in artificial intelligence, which are used to solve various problems, in particular, in philology. Each of them has its own unique approaches to language information processing and text analysis, and their interaction plays an important role in modern research and application of AI in education and science [1, 2], in particular in philology [3, 4].

Symbolic and connectionist approaches have their own unique advantages when applied to philology. The symbolic approach provides clarity and control over language structures [5, 6, 7, 8], while the connectionist approach provides flexibility and the ability to learn from big data [9]. Together, they create new opportunities for automating language research, text analysis, and developing innovative tools for working with language.

**The Main Part.** Innovative artificial intelligence in philology opens up new opportunities for analysis, understanding and application of language in the modern world. It not only automates processes that were previously performed manually, but also allows solving tasks that were inaccessible to traditional methods of linguistic analysis. Here are some key aspects of the use of artificial intelligence in philology.

1. Natural Language Processing (NLP)

Natural language processing is one of the most powerful AI tools in philology. It includes automatic understanding, processing and generation of texts.

Text analysis: AI allows analyzing large corpora of texts to identify linguistic patterns, semantic relationships, stylistic features, and even content.

Syntactic and morphological analysis: The use of NLP tools allows you to automatically and accurately determine the syntactic structures of sentences and the grammatical characteristics of words.

Semantic analysis: AI helps not only to understand the meaning of individual words, but also to analyze the context and meaning of whole phrases and sentences.

2. Automatic translation

One of the most famous examples of the use of AI in philology is machine translation.

Neural networks: Modern translation systems use deep neural networks, which allows to translate texts with greater accuracy [10]. Such systems take into account context, idioms and stylistics, which allows for more natural translations.

Improving the quality of translation: Thanks to AI, translation systems are constantly improving, learning from large sets of texts and taking into account the linguistic and cultural characteristics of languages.

3. Intelligent text analysis

Innovative methods of artificial intelligence make it possible to create systems for deep text analysis.

Sentiment Analysis: This technology allows you to automatically determine the emotional color of the text, which is used to analyze opinions in social networks, news and other sources of text information.

Stylometrics: AI can analyze the style of authors, helping to recognize anonymous works, analyze literary styles, or even verify the authorship of texts.

4. Text generation

One of the most innovative aspects of AI is text generation. This includes creating new texts based on specific data or topics – i.e. LLM [11, 12].

Automated writing: AI can generate articles, news, poetry and even literary works used in journalism, marketing and creativity.

Support for creative processes: Artificial intelligence can be useful for authors, helping them generate ideas, create narrative structures or suggest options for plot development.

5. Automated training systems

AI is also changing the approach to education in philology.

Intelligent learning systems: The use of AI in educational platforms allows you to adapt learning materials to the needs of students, offer personalized exercises and monitor progress in language learning.

Grammar and style checking: Tools like Grammarly use AI to automatically check the grammar, spelling, and style of text, helping students improve their language skills.

6. Study of language changes and dialects

AI contributes to the expansion of research in the field of dialectology and sociolinguistics.

Dialect analysis: AI can help automatically recognize and analyze dialectal features of a language, which previously required considerable effort and time for researchers.

Monitoring changes in language: Using large volumes of textual data, AI allows you to track the evolution of language, learn new trends and changes in the use of words and expressions.

7. Automation of routine tasks

Thanks to machine learning for artificial intelligence, many routine tasks in philology can be automated, which frees up time for creative and scientific work [13, 14, 15, 16].

Digitization of texts: AI tools can automatically digitize and index vast arrays of texts, facilitating access to literary sources and archival materials.

Text classification: AI can be used to classify texts by topic, genre, or author, making it easier for philologists and literary researchers.

8. Interaction of symbolic and connectionist approaches. In recent years, researchers have begun to actively combine both approaches to achieve maximum efficiency in philology under two scenarios: 1). Hybrid systems (the combination of symbolic methods for formalizing language knowledge and connectionist models for learning on big data allows creating powerful solutions [17, 18] that take into account both structured information and casual language patterns); 2). Supervised learning (Symbolic models can serve as a foundation for learning connectionist models, providing them with clearer rules and structures from which to begin the learning process).

**Conclusions.** Innovative artificial intelligence greatly expands the possibilities of philology, providing new approaches to analysis, learning, research and even creativity. The ability to process large amounts of data and discover complex patterns helps not only to automate routine processes, but also to gain new knowledge about language, texts and their use. AI is becoming an indispensable tool for modern philologists who strive to keep up with technological changes and use linguistic resources more effectively.

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