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Machine Learning in Innovative Literary Studies: Features and Applications under SHIVA and WARMI Philological Environments

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Abstract. The article is devoted to the study of the features of the application of machine learning technologies in modern innovative literary studies in the conditions of the SHIVA and WARMI world. The main directions of using intelligent algorithms for the analysis of literary texts, their advantages, limitations and development prospects are considered. The conclusion is made about the high efficiency of hybrid models that combine machine learning methods and traditional literary analysis.

Keywords: digital philology, computational linguistics, machine learning, literary studies, artificial intelligence, literary text analysis, digital humanities, SHIVA-world, WARMI-world.

Introduction.

The current stage of development of philological science [1] is characterized by a rapid digital transformation of methods for studying literary works, an expansion of the volume of available digital corpora of texts [2] and the active implementation of artificial intelligence technologies [3]. One of the most promising areas of this transformation is Machine Learning (ML), which significantly expands the analytical capabilities of modern philology [4], and literary studies in particular, allowing to automate the processing of large arrays of literary texts, identify hidden patterns, model the author's style, explore intertextual connections and predict the features of literary evolution, etc. These technologies are becoming particularly relevant in the context of the formation of a new global environment, which is increasingly described by the concepts of SHIVA (Split,

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Horrible, Inconceivable, Vicious, Arising) and WARMI (World of Asymmetric Risks and Massive Instability). Unlike VUCA or BANI models, SHIVA and WARMI approaches focus on a high degree of systemic instability, unpredictability, accelerated change in information flows, digital fragmentation of knowledge and the constant emergence of new risks. In such conditions, all areas of science and technology = also need intelligent machine learning technologies [5], capable of processing, analyzing and analyzing large volumes of batch and streaming data [6] (structured, semi-structured and unstructured) in order to form new scientific and practical knowledge.

In particular, modern literary studies are gradually moving from an exclusively qualitative analysis of individual works to a comprehensive study of large literary corpora using methods of intelligent data analysis (using all types of machine learning). Thus, machine learning allows not only to automate traditional philological procedures, but also to identify patterns that are inaccessible to classical literary analysis [7]. Thanks to machine learning = the possibilities of studying artistic evolution, genre transformations, authorial idiosyncrasies [8], literary influences and cultural interactions are significantly expanded.

Despite the significant progress of artificial intelligence technologies, the specifics of the application of machine learning in literary studies remain insufficiently developed. Most of the existing research is devoted to general issues of natural language processing or digital humanities, while the features of using ML to solve literary studies problems require further scientific understanding.

Taking into account the above, the aim of the article is to study the features of the application of machine learning technologies in modern innovative literary studies, to determine their scientific potential, advantages, limitations and development prospects in the conditions of the SHIVA and WARMI worlds.

Main Part.

Machine learning as a technological basis for digital literary studies. The development of artificial intelligence has significantly changed the methodology of humanities research. If previously computer technologies were mainly used as a tool for storing texts and searching for information [9], then modern machine learning algorithms are becoming a full-fledged intellectual tool for analyzing literary heritage. In literary studies, machine learning is a set of

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algorithms that can independently detect patterns in text data without predefined rules. Instead of programming specific algorithms, the researcher forms a training sample, after which the model independently obtains statistical dependencies that can be used to solve various literary studies problems. Such an approach significantly differs from traditional methods of philological analysis in that it allows working simultaneously with tens of thousands of works of different eras, trends and national literatures.

Features of literary data as an object of machine learning. A literary text is significantly different from most objects of analysis used in engineering or economic problems of machine learning. A literary work is characterized by a high degree of ambiguity, symbolism, contextual dependence and cultural conditioning. Each literary text contains several levels of information at the same time: lexical, syntactic, stylistic, compositional, semantic, cultural and philosophical. A significant part of literary meanings is formed using metaphors, allusions, intertextual connections and artistic images, which significantly complicates their automatic processing. In addition, literary works of different eras are characterized by the variability of language, historical specificity of word use, diversity of genre norms and authorial artistic techniques. Therefore, machine learning models should take into account not only statistical characteristics of the text, but also its cultural and historical context.

Main areas of application of machine learning in literary studies. Modern innovative literary studies uses machine learning technologies to solve a wide range of research problems. One of the most common areas is the automatic attribution of authorship of literary works. Algorithms are capable of analyzing hundreds of stylometric characteristics of the text, revealing individual features of the author's writing even in anonymous or controversial works. Another actively developing area is the classification of literary works by genres, literary movements, and art schools. Machine learning allows you to identify hidden structural features of genres, which are difficult to formalize using traditional methods. Automatic detection of thematic structures of works, analysis of the emotional dynamics of the story, modeling the development of plots, and research into the network of interactions of literary characters are of great importance. A promising direction is the study of the evolution of

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literary processes based on the analysis of large digital libraries, which allows you to trace the transformation of artistic styles and cultural influences over long historical periods.

Innovative machine learning algorithms in literary studies. Modern research uses a wide range of machine learning algorithms, differing in complexity and analytical capabilities. Supervised learning methods are successfully used in automatic classification of works, identification of authorship, and genre recognition. Unsupervised learning is effectively used to identify hidden thematic clusters, group literary texts, and search for new patterns in large text arrays. Deep learning methods based on neural networks [10] occupy a special place. They allow modeling complex semantic dependencies between words, taking into account a wide context, and analyzing hidden structures of works of art. Due to this, the quality of research into literary language and authorial stylistics significantly increases.

Advantages of using machine learning in innovative literary studies. The use of machine learning technologies significantly expands the capabilities of modern philology. First, the scale of research significantly increases. The analysis of thousands of works becomes possible in a relatively short time, while traditional literary analysis of such volumes is practically impossible. Secondly, the objectivity of the study increases by reducing the influence of the researcher's subjective interpretation on the initial data processing. Thirdly, algorithms are able to detect statistically significant patterns that cannot be detected in the form of traditional qualitative analysis. Ultimately, machine learning allows you to integrate literary studies with other scientific areas - computational linguistics, digital humanities, cognitive sciences, mathematical modeling and big data analysis.

Limitations of machine learning in literary studies. Despite the high efficiency of modern algorithms, the application of machine learning in literary studies is accompanied by a number of limitations. The main problem remains the complexity of formalizing artistic content. Algorithms successfully analyze statistical patterns of the text, but the interpretation of symbolism, artistic imagery and cultural connotations, as before, requires the participation of the researcher. Additional difficulties are created by the limited quality of the marked-up literary

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corpora, the heterogeneity of historical texts, the variability of translations and the insufficient representativeness of individual literary trends. In addition, the models may inherit the elimination of training samples, which can affect the objectivity of the results obtained.

Machine learning in the conditions of SHIVA and WARMI worlds. Modern conditions are characterized by a high rate of emergence of new information, digital fragmentation of knowledge, information loads and the constant emergence of new social and cultural challenges. In such conditions, traditional methods of literary analysis are unable to provide the necessary efficiency of information processing. Machine learning allows literary research to adapt to the high dynamics of the digital environment, ensuring continuous analysis of new literary publications, electronic libraries, digital archives and multimodal texts. The use of adaptive models that can regularly retrain as new literary data appears is especially important. This ensures the stability of research models in conditions of high uncertainty characteristic of the SHIVA and WARMI worlds.

Prospects for the further development of intellectual literary studies. In the coming years, further integration of machine learning with generative artificial intelligence, large language models, semantic knowledge graphs and technologies of understandable artificial intelligence is expected. Promising directions are the creation of intelligent literary expert systems, digital models of the historical and literary process, hybrid systems for automatic interpretation of literary texts, and intellectual platforms for supporting scientific research in the field of philology. The most effective are hybrid models that combine the computational capabilities of artificial intelligence with professional philological interpretation, which will significantly improve the quality of literary research.

Conclusions.

Machine learning is becoming one of the key areas of innovative digital transformation of modern literary studies. Its application significantly expands the analytical capabilities of philological science, provides processing of large literary corpora, automation of stylometric analysis, research of genre and thematic structures, modeling of literary evolution and identification of hidden patterns of literary texts.

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The specificity of literary studies requires adaptation of machine learning algorithms to the features of a literary text, which has ambiguity, symbolism, high contextual dependence and cultural and historical conditioning. Therefore, the most promising are hybrid intelligent models that combine artificial intelligence methods with classical approaches to literary analysis.

In the conditions of the SHIVA and WARMI world, the importance of machine learning for literary studies is growing significantly. Intelligent algorithms allow you to work effectively in conditions of high uncertainty, information turbulence and rapid growth of digital literary resources, providing scientific support for innovative research in modern philology. Further development of this direction will be associated with the integration of machine learning, generative artificial intelligence, digital humanities, and understandable intellectual systems, forming a new paradigm of innovative literary studies.

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