PHILOLOGY AND LINGUISTICS

Artificial neural networks in modern paleography

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Introduction.

Modern philology, which studies language structures, texts and cultural heritage, is faced with large volumes of data, including literary works, historical documents and modern digital texts. Traditional methods of text analysis often require significant time and high qualifications of specialists, which limits the speed and scale of scientific research.

Artificial neural networks (ANN) open up new opportunities for automating and accelerating the processing of structured, semi-structured and unstructured information [1], including Big Data [2], [3]. They are able to detect hidden patterns in language, classify texts by genre, period, style or author, analyze semantic and syntactic structures, and predict lexical and stylistic features. Both classical, shallow ANN [4] and modern ANN architectures [5], including recurrent networks (RNN), transformers and convolutional networks (CNN), demonstrate high accuracy in text processing and allow researchers to work effectively with large data sets [6]. The use of artificial neural networks in philology contributes to the automation of text analysis, increasing the accuracy of data classification and systematization, opening up new opportunities for the study of language, literary heritage and language changes in different historical periods.

Main Part.

Modern paleography, as a scientific discipline that studies manuscript sources and historical documents, is faced with large volumes of data and the complexity of analyzing handwriting and stylistic features of writing. Traditional

Proceedings of the 6th International
Scientific and Practical Conference
«Science: Development and Factors
its Influence»

(October 6-8, 2025).
Amsterdam, Netherlands

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research methods often require significant time and high qualifications of specialists, which limits the speed and scale of scientific research.

Artificial neural networks (ANN), as one of the main tools of artificial intelligence, open up new opportunities for automating and accelerating the processing of handwritten texts. They are able to detect hidden patterns in letter forms, ornamental elements and writing styles, classify documents by periods, regions or authors, and restore damaged or incomplete texts. Modern ANN architectures, including convolutional neural networks (CNN) and recurrent networks (RNN), demonstrate high accuracy of handwritten text recognition and significantly expand the analytical potential of paleography.

The use of artificial neural networks in paleography contributes to the automation of routine processes, increasing the accuracy of classification and analysis of large amounts of historical data, opening up new opportunities for the systematic study of written heritage and accelerating scientific discoveries.

Conclusions.

1. Artificial neural networks in modern philology provide effective recognition, classification and analysis of texts, allowing to accelerate research processes and reduce the burden on specialists. They help to reveal hidden patterns in speech and styles, classify texts according to various criteria and analyze large amounts of information.

Thus, the integration of ANNs into philological research increases the accuracy, scalability and efficiency of text analysis, opens up opportunities for the creation of digital corpora, automation of scientific processes and in-depth study of linguistic and literary heritage. Artificial neural networks are becoming a key tool for the modernization of philological science and intellectual analysis of texts.

2. Artificial neural networks in modern paleography provide effective recognition, classification and restoration of handwritten documents, which allows to significantly accelerate analytical processes and reduce dependence on manual work of specialists. They allow to reveal hidden patterns in handwriting, writing style and decorative elements, to classify documents according to various criteria and to restore damaged fragments.

Thus, the integration of ANNs into paleographic research increases the accuracy, scalability and efficiency of

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manuscript analysis, opens up opportunities for the creation of digital archives, automation of scientific processes and in-depth study of historical written heritage. Artificial neural networks are becoming a key tool for the modernization of paleography and intellectual analysis of historical sources.

Discussion.

Modern paleography, which studies manuscripts and historical documents, is faced with an increase in the volume of materials and the complexity of analyzing handwriting and stylistic features of writing. Traditional methods often require significant time and high qualifications of specialists, which limits the scale and speed of scientific research. The author argues that it is hybrid neural networks, combining different artificial intelligence architectures [7], that open up new opportunities for automated analysis of manuscripts. They allow you to detect hidden patterns in the forms of letters, ornamental and stylistic elements of writing, classify documents by periods, regions or authors, and also restore damaged or incomplete texts. The use of hybrid neural networks in paleography provides automation of routine processes, increases the accuracy of classification, allows you to process large volumes of historical data and opens up new opportunities for the systematic study of written heritage and historical sources.

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Proceedings of the 6th International
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