A MODERN SOLUTION TO THE PROBLEMS OF MODERN LINGUISTICS AND TRANSLATION STUDIES

Murtozakulova Shaxnoza Botirjon kizi
Mirzo Ulug'bek nomidagi
Òzbekiston Milliy universiteti talabasi.

Abstract: This article explores the challenges faced by modern linguistics and translation studies in the rapidly evolving digital age. It proposes a comprehensive, technology-driven approach to address these issues, focusing on the integration of artificial intelligence, machine learning, and natural language processing. The study employs a mixed-methods approach, combining qualitative analysis of existing literature with quantitative data from recent experiments in computational linguistics. The article concludes by outlining a roadmap for future research and implementation, emphasizing the need for collaboration between linguists, computer scientists, and industry stakeholders.

Keywords: modern linguistics, translation studies, artificial intelligence, machine learning, natural language processing

Annotatsiya: Ushbu maqola tez rivojlanayotgan raqamli asrda zamonaviy tilshunoslik va tarjimashunoslik duch keladigan muammolarni o'rganadi. Ushbu muammolarni hal qilish uchun sun'iy intellekt, mashinani o'rganish va tabiiy tilni qayta ishlashni birlashtirishga qaratilgan keng qamrovli, texnologiyaga asoslangan yondashuvni taklif qiladi. Tadqiqotda mavjud adabiyotlarning sifatli tahlilini hisoblash tilshunosligidagi so'nggi tajribalarning miqdoriy ma'lumotlari bilan birlashtirgan aralash usulli yondashuv qo'llaniladi. Maqola tilshunoslar, kompyuter olimlari va sanoat manfaatdor tomonlari o'rtasida hamkorlik zarurligini ta'kidlab, kelajakdagi tadqiqotlar va amalga oshirish uchun yo'l xaritasini bayon qilish bilan yakunlanadi.

Kalit so'zlar: zamonaviy tilshunoslik, tarjimashunoslik, sun'iy intellekt, mashinani o'rganish, tabiiy tilni qayta ishlash

Аннотация: В этой статье исследуются проблемы, с которыми сталкиваются современная лингвистика и переводоведение в быстро развивающуюся цифровую эпоху. В ней предлагается комплексный, основанный на технологиях подход к решению этих проблем, с акцентом на интеграцию искусственного интеллекта, машинного обучения и обработки естественного языка. В исследовании используется подход смешанных методов, сочетающий качественный анализ существующей литературы с количественными данными недавних экспериментов в области компьютерной лингвистики. В заключение статьи излагается план будущих исследований и внедрения, подчеркивается необходимость сотрудничества между лингвистами, специалистами по информатике и заинтересованными сторонами отрасли.

Ключевые слова: современная лингвистика, переводоведение, искусственный интеллект, машинное обучение, обработка естественного языка

Introduction. The field of linguistics and translation studies has undergone significant changes in recent years, driven by the rapid advancement of technology and the increasing

globalization of communication [1]. As the volume and complexity of linguistic data continue to grow, traditional approaches to language analysis and translation have struggled to keep pace [2]. This article proposes a modern solution to these challenges, leveraging the power of artificial intelligence (AI), machine learning (ML), and natural language processing (NLP) to create a more efficient, accurate, and adaptable framework for linguistic research and translation practice.

Object of Study and Methods Used

The primary object of this study is the application of AI, ML, and NLP techniques to the field of linguistics and translation studies. To investigate this topic, a mixed-methods approach was employed, combining qualitative analysis of existing literature with quantitative data from recent experiments in computational linguistics [3]. The qualitative component involved a systematic review of scholarly articles, conference proceedings, and industry reports, focusing on the current state of the art in AI-driven language technologies. The quantitative component consisted of a series of experiments using state-of-the-art NLP models, such as transformer-based architectures [4], to evaluate their performance on a range of linguistic tasks, including sentiment analysis, named entity recognition, and machine translation.

The Results Obtained and Their Analysis

The results of this study demonstrate the immense potential of AI, ML, and NLP technologies to revolutionize the field of linguistics and translation studies. The qualitative analysis revealed a growing consensus among researchers and practitioners regarding the benefits of these approaches, including increased efficiency, accuracy, and scalability [5]. The quantitative experiments provided empirical evidence to support these claims, with the NLP models achieving impressive results across a variety of linguistic tasks. For example, the transformer-based machine translation system outperformed traditional statistical models by a significant margin, producing more fluent and idiomatically correct translations [6].

One of the most promising findings was the ability of AI-driven systems to handle complex, multi-lingual datasets with ease. In a series of experiments conducted on a corpus of legal documents from the European Union, an NLP model trained on 24 languages was able to accurately identify named entities, such as people, organizations, and locations, with an average F1 score of 0.92 [7]. This highlights the potential for these technologies to break down language barriers and facilitate cross-cultural communication in an increasingly globalized world.

Another notable result was the successful application of machine learning techniques to the task of sentiment analysis in social media data. Using a combination of convolutional neural networks and long short-term memory (LSTM) models, researchers were able to classify the emotional content of tweets with an accuracy of 87%, outperforming traditional lexicon-based approaches [8]. This opens up new possibilities for understanding public opinion, monitoring brand reputation, and detecting trends in real-time.

However, the analysis also highlighted several challenges and limitations associated with the adoption of these technologies. One key issue is the need for large, high-quality datasets to train and evaluate AI models, which can be difficult and expensive to obtain [9]. This is particularly problematic for low-resource languages and specialized domains, where data scarcity can hinder the development of effective AI solutions.

Conclusion

The findings of this study underscore the immense potential of AI, ML, and NLP technologies to transform the field of linguistics and translation studies. By leveraging these cutting-edge tools, researchers and practitioners can develop more efficient, accurate, and nuanced

approaches to language analysis and translation, keeping pace with the rapidly evolving digital landscape. However, realizing this potential will require a concerted effort to address the challenges and limitations associated with these technologies, including the need for high-quality data, interpretability, and bias mitigation.

To move forward, the article proposes a roadmap for future research and implementation, emphasizing the importance of interdisciplinary collaboration and knowledge sharing. By working together, linguists, computer scientists, and industry stakeholders can harness the power of AI to create a more inclusive, accessible, and effective framework for linguistic research and translation practice in the modern era.

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