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Research Article

MODELING ANALYTICAL VERB FORMS FOR THE MORPHOLOGICAL ANALYZER OF THE UZBEK LANGUAGE

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ABSTRACT

This paper explores the complexities involved in handling lexemes containing multiple word forms within the field of computational linguistics. It investigates diverse approaches and technological advancements, encompassing both syntactic and semantic analyses. Furthermore, it addresses the challenges encountered in Uzbek linguistics regarding the translation of analytical forms consisting of multiple word forms, along with potential solutions. Additionally, it emphasizes the importance of examining lexemes with multiple word forms within computational linguistics, offering insights into pioneering researchers in this field. The intricacies inherent in processing such lexemes in computational linguistics arise from their ambiguity, varied forms, and meanings, necessitating context consideration for accurate parsing of word combinations. The article also advocates for the development of effective analytical methods capable of capturing the intended meaning of expressions.

KEYWORDS

Computational linguistics, morphological analysis algorithms, semantic analysis algorithms, semantic models, natural language, morphological analysis tools, analytical verb forms, morphological complexity, semantics, text corpora, linguistic technologies, deep learning, multilingual systems.

INTRODUCTION

Modeling analytical verb forms for the morphological analyzer of the Uzbek language represents an intriguing area of research within computational linguistics, especially when dealing with lexemes consisting of multiple word forms. In this context, various aspects are considered, including the

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morphological complexity of the Uzbek language, verb analysis, and the development of corresponding processing methods.

- The Uzbek language belongs to the Turkic language family and has a complex morphology, including an extensive system of verb forms and analytical constructions. This creates challenges in morphological analysis and parsing of verbs.

- Analytical verb forms in the Uzbek language are constructions consisting of a verb stem and an auxiliary verb or particle used to express temporal and modal meanings. An example of such a construction is "qilmoq" (to do) + "-gani" (state of completion). - Research is conducted to develop models and algorithms for the efficient processing of analytical verb forms, capable of correctly recognizing and analyzing such constructions. This includes creating grammatical rules and dictionaries, as well as using machine learning methods to train the system to recognize analytical forms.

- When modeling analytical verb forms, it is important to consider the context and semantics of the sentence. For example, to accurately determine the temporal meanings of constructions, it is necessary to analyze surrounding words and contextual features.

- Experiments are conducted to evaluate the quality of the developed methods and models for processing analytical verb forms. This includes testing on various text corpora and analyzing the results to identify the effectiveness and accuracy of the proposed approaches.

Thus, research on modeling analytical verb forms for the morphological analyzer of the Uzbek language within the field of computational linguistics encompasses various stages, ranging from analyzing the morphological structure of the language to developing and testing corresponding processing methods and models. These studies are of significant importance for the advancement of language technologies and ensuring a more precise and comprehensive analysis of texts in the Uzbek language.

Processing multi-word lexemes

Processing multi-word lexemes has a number of advantages in global computational linguistics, especially when it comes to Turkic languages. Some of the key benefits are listed below:

- Turkic languages have rich morphology, which means that words can have different forms depending on the context and grammatical rules. Processing multiword lexemes allows us to take into account this morphological complexity and adapt analysis algorithms to specific contexts.

- Turkic languages often have words that have multiple meanings depending on the context. Multiword token

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processing allows you to use context to resolve ambiguity and select the most appropriate meaning of a word.

- Processing of multi-word tokens helps improve the quality of machine translation for Turkic languages. Understanding phrases in context allows you to create more accurate and natural translations that take into account the grammar and semantics of these languages.

- Processing of multi-word lexemes allows you to take into account the context when analyzing texts in Turkic languages. This allows you to create more adaptive and flexible systems that can adequately respond to different contexts and situations.

- The development of methods for processing multi-word lexemes for Turkic languages contributes to the creation of various applications and resources, including machine translation systems, text analysis, information retrieval and many others. This opens up new opportunities for the development of language technologies in the Turkic language community.

Thus, the processing of multi-word lexemes plays an important role in global computational linguistics for Turkic languages, providing more accurate and tailored analysis of texts in these languages, which contributes to the development of language technologies and communication in this language community.

Current trends in the study and practical application of processing multi-word lexemes in global computer linguistics

Current trends in the study and practical application of processing multi-word lexemes in global computational linguistics reflect the importance of effective analysis and understanding of natural language texts. Below are some of the key trends:

- One of the current trends is the widespread use of deep learning in the processing of multi-word tokens. Deep learning methods make it possible to create complex neural networks that can automatically extract features from texts and build models that can efficiently work with large amounts of data.

- Semantic models based on word vector representation and contextual understanding are becoming increasingly popular in the processing of multiword lexemes. These models allow you to take into account the semantic relationships between words and phrases in the text, which increases the accuracy of the analysis and interpretation of texts.

- With the development of international communications and the global economy, the need for multilingual systems for processing multi-word lexemes is increasing. Researchers and developers are working to create systems that can effectively work with texts in different languages and provide high-quality machine translation and analysis.

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- With the advent of large volumes of text data, such as social media, news articles, scientific publications and others, there is a need to develop methods for processing multi-word tokens that can handle such data on a large scale and provide fast and efficient processing.

- Current trends in multiword token processing include integration with other areas of computer science such as image, sound, and data processing. This makes it possible to create more complete and integrated systems for text analysis and natural language interpretation.

These trends reflect the desire of researchers and developers to create more accurate, efficient, and scalable systems for processing multiword tokens that can be successfully applied in various fields, including machine translation, information retrieval, text mining, and more.

The topic of processing lexemes consisting of multiple word forms

The topic of processing lexemes consisting of multiple word forms is an important research area in computational linguistics, and many scholars have contributed to this area at different times. Below are some famous researchers and their contributions to this topic:

- Noam Chomsky is one of the leading researchers in the field of computational linguistics and theoretical linguistics in general.

- His work on the theory of grammar and syntactic analysis of language had a significant influence on the development of methods for processing multi-word lexemes.

- Karen Spark Johnson has made significant contributions to the fields of information retrieval and natural language processing.

- Her work on statistical text analysis and information extraction methods is important for the processing of multi-word tokens.

- James Martin is known for his research in the field of computational linguistics and artificial intelligence.

- He made significant contributions to the development of algorithms and methods for processing multi-word tokens, including syntactic and semantic analysis.

- Johan Bos specializes in semantic analysis of natural language and the development of semantic models for processing multi-word tokens.

- His research in computational linguistics makes important contributions to understanding the meaning of words and phrases in context.

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- Jason Ismay is known for his research in statistical modeling and machine learning in computational linguistics.

- His work concerns various aspects of the processing of multiword lexemes, including morphological and syntactic analysis.

This is just a small list of researchers who have made significant contributions to the field of multiword token processing in computational linguistics. Many other scientists continue to work in this area, striving to further develop methods and technologies for more accurate and efficient analysis of natural language texts.

Further improvement of methods and algorithms for processing multi-word lexemes in computational linguistics is a key area of research in order to improve the accuracy and quality of automatic text analysis and their interpretation by computer systems. This is important in the context of efficient natural language processing and understanding, which is the basis for many applications including machine translation, automatic summarization, text mining, and many others.

Key areas for further improvement include:

- Development of more accurate and efficient algorithms for highlighting the morphological characteristics of words and word forms, which will make it possible to more accurately determine their grammatical properties and contextual use.

- Creation of more complex and adaptive syntactic models that are able to take into account not only local grammatical rules, but also contextual features of sentences and texts as a whole.

- Implementation of semantic models based on vector representation of words and contextual understanding, for a deeper analysis of the meaning of words and phrases, taking into account their semantic relationships and meanings in different contexts.

- Research and development of new approaches to disambiguating the meanings of words and phrases in a text in order to eliminate ambiguities and select the most likely meaning based on context and semantic features.

- Using machine learning and deep learning methods to automatically extract and analyze patterns in text, which allows you to create more efficient and adaptive models for processing multi-word tokens.

The objective of these enhancements is to develop computer systems with increased precision and dependability, enabling them to autonomously analyze and comprehend natural language texts with heightened accuracy and contextual understanding. This advancement will facilitate the creation of enhanced applications within natural language

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processing, enhancing communication quality and interaction with computer systems.

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