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Semantic Issues In Artificial Intelligence Vocabulary In English And Uzbek

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A B S T R A C T

The rapid development of Artificial Intelligence (AI) has significantly influenced modern scientific, technological, and linguistic communication. As AI technologies continue to expand, a large number of new terms and lexical units have emerged to describe algorithms, computational models, intelligent systems, data-processing methods, and ethical concepts. This article examines the semantic characteristics of AI vocabulary in English and Uzbek, focusing on the formation, interpretation, translation, and adaptation of AI-related terminology. Particular attention is given to semantic equivalence, polysemy, synonymy, borrowing, calquing, and terminological variation. The comparative analysis demonstrates that English functions as a major source of contemporary AI terminology, while Uzbek is developing corresponding terminology through translation, semantic adaptation, and direct lexical borrowing. The study also emphasizes the importance of terminological consistency and semantic precision in the development of Uzbek AI vocabulary.

A R T I C L E I N F O

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K E Y W O R D S: Artificial Intelligence, AI vocabulary, semantics, terminology, English, Uzbek, semantic equivalence, borrowing, translation, lexical adaptation.

Аннотация

Стремительное развитие искусственного интеллекта (ИИ) оказывает значительное влияние на современную научную, технологическую и лингвистическую коммуникацию. По мере расширения сферы применения технологий искусственного интеллекта постоянно формируется и развивается значительный объем новой терминологии и лексических единиц, обозначающих алгоритмы, вычислительные модели, интеллектуальные системы, методы обработки данных, а также этические и социальные аспекты применения ИИ. В данной статье рассматриваются семантические особенности лексики искусственного интеллекта в английском и узбекском языках с акцентом на процессы формирования, интерпретации, перевода и адаптации терминологии, связанной с ИИ. Особое внимание уделяется таким языковым и терминологическим явлениям, как семантическая эквивалентность, полисемия, синонимия, заимствование, калькирование и терминологическая вариативность. Сопоставительный анализ показывает, что английский язык выступает одним из основных источников современной терминологии в области искусственного интеллекта, тогда как в узбекском языке соответствующая терминологическая система развивается посредством перевода, семантической адаптации и непосредственного лексического заимствования. В статье также подчеркивается важность терминологической последовательности и семантической точности для дальнейшего развития и стандартизации узбекской лексики в сфере искусственного интеллекта.

Ключевые слова: искусственный интеллект, лексика ИИ, семантика, терминология, английский язык, узбекский язык, семантическая эквивалентность, заимствование, перевод, лексическая адаптация.

Introduction

Artificial Intelligence has become one of the most rapidly developing areas of contemporary science and technology. Its expansion into education, medicine, economics, business, engineering, communication, and other fields has resulted in the emergence of a rapidly growing specialized vocabulary. Terms such as *Artificial Intelligence, Machine Learning, Deep Learning, Neural Network, Natural Language Processing, Computer Vision,* and *Generative AI* have become widely used in international scientific communication.

English plays a particularly significant role in the formation and dissemination of AI terminology because a substantial proportion of scientific publications, software documentation, technological standards, and professional communication in the field are produced in English. Consequently, many AI terms enter other languages through direct borrowing, translation, calquing, or semantic adaptation.

In Uzbek, the rapid development of digital technologies has also contributed to the formation of a specialized AI vocabulary. However, the process of transferring AI terminology from English into Uzbek involves several semantic and terminological challenges. These include the absence of established equivalents, variation in translation, differences in conceptual interpretation, and competition between borrowed and translated forms.

1. Semantic Characteristics of AI Vocabulary

AI vocabulary represents a complex terminological system consisting of several interconnected semantic fields. These fields reflect different aspects of artificial intelligence, including technologies, methods, computational processes, applications, data, and ethical principles.

One major semantic group includes general AI concepts:

- *Artificial Intelligence — Sun'iy intellekt*
- *Intelligent System — Intellektual tizim*
- *AI Model — SI modeli*
- *AI Technology — SI texnologiyasi*

A second semantic field concerns machine learning and computational methods:

- *Machine Learning — Mashinaviy o'qitish*
- *Deep Learning — Chuqur o'rganish*
- *Reinforcement Learning — Mustahkamlovchi o'qitish*
- *Neural Network — Neyron tarmoq*
- *Algorithm — Algoritm*

Another important semantic field is associated with language technologies:

- *Natural Language Processing — Tabiiy tilni qayta ishlash*
- *Large Language Model — Katta til modeli*
- *Language Model — Til modeli*
- *Speech Recognition — Nutqni tanib olish*
- *Chatbot — Chatbot*

These terms demonstrate that AI vocabulary is not a homogeneous lexical group. Rather, it constitutes a hierarchical and multidimensional semantic system.

2. Semantic Equivalence in English and Uzbek

One of the central problems in translating AI terminology is achieving semantic equivalence between English and Uzbek. Some terms have relatively stable equivalents, while others require additional explanation or adaptation.

For example, the term *Artificial Intelligence* corresponds directly to *sun'iy intellekt*. The two expressions share a similar conceptual structure and refer to technologies designed to perform tasks associated with human intelligence.

Similarly, *Neural Network* and *neyron tarmoq* demonstrate a relatively close semantic correspondence. However, some terms cannot always be translated literally because their technical meanings have developed within a specific scientific context.

The term *Machine Learning* is particularly significant. Its Uzbek equivalent *mashinaviy o'qitish* is formed through semantic and structural adaptation. The translation reflects the conceptual meaning of a computational system that learns patterns from data rather than being explicitly programmed for every individual task.

3. Polysemy and Semantic Extension

Polysemy is another important characteristic of AI vocabulary. Some terms that originally belonged to general scientific or everyday language acquire specialized meanings in the context of AI.

For example, the English word *training* generally refers to the process of developing skills or knowledge. In AI terminology, however, *model training* refers to the computational process through which a machine-learning model learns patterns from data.

Similarly, *learning* has a specialized technical meaning in *machine learning*. It does not necessarily refer to human cognitive learning but to the optimization of computational parameters based on data.

The Uzbek terms *o‘qitish* and *o‘rganish* may therefore create semantic difficulties because their everyday meanings differ from their specialized meanings in AI discourse. This demonstrates the importance of contextual analysis when developing and translating AI terminology.

4. Borrowing and Calquing

Two major mechanisms involved in the development of Uzbek AI terminology are lexical borrowing and calquing.

Some terms are borrowed with relatively minor phonological or orthographic adaptation:

- *algoritm — algorithm*
- *robot — robot*
- *chatbot — chatbot*
- *model — model*
- *platforma — platform*

Other terms are translated through calquing or structural reproduction. For example:

Artificial Intelligence → Sun’iy intellekt
Neural Network → Neyron tarmoq
Natural Language Processing → Tabiiy tilni qayta ishlash
Computer Vision → Kompyuter ko‘rishi

Calquing allows Uzbek terminology to preserve important components of the original English conceptual structure while adapting them to the grammatical and lexical system of Uzbek.

5. Synonymy and Terminological Variation

AI terminology also demonstrates terminological variation. Different translations of the same English term may appear in academic publications, educational materials, media texts, and technological documentation.

For instance, variations may occur because translators select different Uzbek equivalents for concepts such as *machine learning, deep learning,* or *prompt*. Such variation can create difficulties for researchers, students, translators, and dictionary users.

Terminological standardization is therefore important. A specialized term should ideally have a clearly defined meaning and a stable linguistic form within a particular professional context.

6. Semantic Issues in AI Ethics Terminology

The development of AI has also introduced a new semantic layer related to ethics and governance. Modern AI vocabulary includes terms such as:

- *AI Ethics — SI etikasi*
- *Algorithmic Bias — algoritmik tarafkashlik*
- *Transparency — shaffoflik*
- *Accountability — javobgarlik*
- *Privacy — maxfiylik*
- *Explainability — tushuntiriluvchanlik*
- *AI Safety — SI xavfsizligi*

These terms are particularly important because their meanings involve not only technological concepts but also legal, social, philosophical, and ethical dimensions. Consequently, their translation requires attention to both linguistic meaning and the conceptual framework in which they are used.

7. Comparative Semantic Analysis

A comparative analysis of English and Uzbek AI vocabulary reveals several major tendencies. First, English currently provides a substantial amount of the international terminology used in AI research and technological communication. Second, Uzbek terminology is developing through a combination of translation, borrowing, and semantic adaptation.

The following simplified semantic matrix illustrates several relationships:

English term	**Uzbek equivalent**	**Semantic relationship**
Artificial Intelligence	Sun'iy intellekt	Direct semantic equivalence
Machine Learning	Mashinaviy o'qitish	Calquing / adaptation
Deep Learning	Chuqur o'rganish	Calquing
Neural Network	Neyron tarmoq	Structural-semantic equivalence
Computer Vision	Kompyuter ko'rishi	Calquing
Chatbot	Chatbot	Borrowing
Algorithm	Algoritm	Borrowing
Generative AI	Generativ sun'iy intellekt	Translation + adaptation
Algorithmic Bias	Algoritmik tarafkashlik	Translation + semantic adaptation
Explainability	Tushuntiriluvchanlik	Derivational adaptation

This comparison demonstrates that English and Uzbek AI vocabularies are interconnected but not identical. The semantic structure of the Uzbek terminology is influenced by the conceptual system of English while simultaneously being adapted to Uzbek linguistic norms.

Conclusion

The vocabulary of Artificial Intelligence constitutes a dynamic and rapidly developing terminological system in both English and Uzbek. Its semantic structure includes technological, computational, linguistic, application-oriented, and ethical domains. The comparison of English and Uzbek AI terminology demonstrates that semantic equivalence cannot always be achieved through direct word-for-word translation. Borrowing, calquing, semantic adaptation, and terminological derivation are important mechanisms in the formation of Uzbek AI vocabulary. At the same time, polysemy, synonymy, terminological variation, and differences in conceptual interpretation create challenges for translation and lexicographic description.

The systematic study of AI vocabulary in English and Uzbek can contribute to the development of standardized terminology, bilingual dictionaries, specialized glossaries, and terminological databases. A consistent semantic approach is particularly important for ensuring accurate scientific communication and supporting the development of Uzbek-language resources in the field of Artificial Intelligence.

References

1. Crystal, D. (2003). *English as a Global Language*. Cambridge University Press.
2. Cabré, M. T. (1999). *Terminology: Theory, Methods and Applications*. John Benjamins.
3. Sager, J. C. (1990). *A Practical Course in Terminology Processing*. John Benjamins.
4. Baker, M. (2018). *In Other Words: A Coursebook on Translation*. Routledge.
5. Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach*. Pearson.
6. Jurafsky, D., & Martin, J. H. (2024). *Speech and Language Processing*. Stanford University.

7. ISO 704. (2009). *Terminology work — Principles and methods*. International Organization for Standardizat