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## **AUTOMATED ASSESSMENT TECHNOLOGY BASED ON ARTIFICIAL INTELLIGENCE**

Norboyev S.

Master's Student of Yangi Asr University

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### **Abstract**

This article analyzes the importance of automated assessment technologies based on artificial intelligence in education and professional activities. It is justified that the development of digital technologies creates the need to automate assessment processes. It is shown that the subjectivity and human factor in traditional assessment methods can be reduced using artificial intelligence. The article covers the content of the concepts of artificial intelligence and automated assessment. The role of machine learning, natural language processing and speech recognition technologies in assessment is analyzed. The application of artificial intelligence-based assessment systems in education, personnel selection and IT is considered. The advantages of these technologies such as speed and objectivity are revealed. At the same time, the problems of algorithmic bias and data security are noted.

**Keywords:** Artificial intelligence, automated assessment, machine learning, natural language processing, digital education, assessment systems, education quality.

### **SUN'IY INTELLEKT ASOSIDA AVTOMATLASHTIRILGAN BAHOLASH TEXNOLOGIYASI**

Norboyev S.

Yangi asr universiteti magistranti

### **Annotatsiya**

Mazkur maqolada sun'iy intellekt asosida avtomatlashtirilgan baholash texnologiyalarining ta'lim va professional faoliyatdagi ahamiyati tahlil qilinadi. Raqamli texnologiyalar rivoji baholash jarayonlarini avtomatlashtirish zaruratini yuzaga keltirayotgani asoslab beriladi. An'anaviy baholash usullaridagi



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subyektivlik va inson omiliga bog‘liq kamchiliklar sun‘iy intellekt yordamida kamaytirilishi ko‘rsatib o‘tiladi. Maqolada sun‘iy intellekt va avtomatlashtirilgan baholash tushunchalarining mazmuni yoritiladi. Mashinali o‘rganish, tabiiy tilni qayta ishlash va nutqni aniqlash texnologiyalarining baholashdagi roli tahlil qilinadi. Sun‘iy intellekt asosidagi baholash tizimlarining ta‘lim, kadrlar tanlash va IT sohalarida qo‘llanilishi ko‘rib chiqiladi. Ushbu texnologiyalarning tezkorlik va xolislik kabi afzalliklari ochib beriladi. Shu bilan birga, algoritmik tarafkashlik va ma‘lumotlar xavfsizligi muammolari qayd etiladi.

**Kalit so‘zlar:** sun‘iy intellekt, avtomatlashtirilgan baholash, mashinali o‘rganish, tabiiy tilni qayta ishlash, raqamli ta‘lim, baholash tizimlari, ta‘lim sifati.

The rapid development of digital technologies is bringing about fundamental changes in education, personnel training and professional assessment systems. In particular, automated assessment technologies based on artificial intelligence (AI) are emerging as an effective, objective and fast tool for identifying knowledge and skills. While traditional assessment methods are subject to high human factor subjectivity, time and resource consumption, artificial intelligence significantly reduces these shortcomings.

In recent years, a number of scientific studies have been conducted by domestic and foreign scientists on automated assessment technologies based on artificial intelligence. In particular, Uzbek researchers R.H. Nasimov, M.N. Muminova, A.R. Ergashev, X.Kh. Ikromov and F.U. Zaripova have proposed methods for automatic assessment of knowledge and competencies in the educational process using machine learning and artificial intelligence algorithms in their scientific works. Their research substantiates the effectiveness and impartiality of artificial intelligence in assessing online tests, written work and practical assignments. In the scientific works conducted by foreign scientists Okan Bulut, Leon Furze, Mike Perkins, Valentine J. Owan and M.C. Madwe, the theoretical foundations, practical models and pedagogical impact of assessment systems based on artificial intelligence were analyzed in depth. In these studies, special attention was paid to the issues of speed of automated assessment, the ability to process large amounts of data and reducing subjectivity in the assessment process. Also, algorithmic



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bias, ethical and legal issues were considered as important scientific problems in foreign studies. An analysis of these scientific works shows that automated assessment technologies based on artificial intelligence are a promising direction in improving the quality of education and assessment efficiency.

Artificial intelligence is a set of technologies that model the analysis, learning, inference and decision-making abilities of computer systems inherent in human intelligence. Automated assessment refers to the process of evaluating tests, written work, oral presentations, practical assignments, or performance outcomes using software tools. The combination of these two concepts makes the assessment process more precise and modern.

Artificial intelligence-based assessment systems rely on the following key technologies:

**Machine Learning:** the system improves its algorithms based on previous results and increases the accuracy of the assessment.

**Natural Language Processing (NLP):** allows for content analysis of essays, answers to open-ended questions, and scientific texts.

**Speech Recognition Technologies:** used in automatic assessment of oral exams and interviews.

**Computer Vision:** used in assessment through practical work, laboratory processes, or observation of behavior.

Automatic assessment technologies based on artificial intelligence are widely used in a number of areas:

**Education system:** in assessing online tests, distance exams, essays, and projects.

**Selection and certification:** in determining the level of knowledge and professional competencies of candidates.

**IT and programming:** in checking code quality, logical solutions, and efficiency.

**Certification and advanced training:** in assessing compliance with professional standards.

The main advantages of this technology are:

- fast and accurate assessment;
- reduction of human error and subjectivity;
- analysis of large amounts of data in a short time;
- the ability to provide individual recommendations for a student or employee.



At the same time, assessment systems based on artificial intelligence also have some problems. In particular, algorithmic bias, data security and confidentiality, as well as the difficulty of fully assessing human creativity and emotional states are limitations of this technology. Therefore, it is important to adhere to ethical and legal standards when implementing AI systems. Automated assessment technology based on artificial intelligence plays an important role in improving the quality of education and assessment efficiency in modern society. It is expected to be more widely used in the future as a tool that complements and improves traditional assessment methods. If properly implemented and managed, this technology will serve to more fully reveal human potential.

Automated assessment technology based on artificial intelligence is a system for analyzing and evaluating knowledge, skills, and performance results using AI (Artificial Intelligence) without or with minimal human intervention.

- The following are the main aspects of this technology:
- Automated assessment technology:
- analyzes tests, written work, speech, code, projects, and activities;
- provides objective, fast, and consistent assessment;
- reduces subjectivity and human error.

Artificial intelligence relies on the following areas:

- Machine Learning – learns from results and increases the accuracy of assessments
- Natural Language Processing (NLP) – analyzes essays, answers and texts
- Computer Vision – evaluates facial expressions, behavior or practical work
- Speech Recognition – checks verbal answers

The results of the study show that artificial intelligence is an effective tool for ensuring the speed, accuracy and impartiality of assessment processes. The superiority of automated systems in reducing the subjectivity and errors associated with the human factor in traditional assessment methods was substantiated. The role of machine learning, natural language processing, speech recognition and computer vision technologies in the assessment process was determined. The effective use of artificial intelligence-based assessment systems in education, personnel selection, IT and certification processes was demonstrated. At the same time, algorithmic bias, data security, and privacy issues



were identified as significant limitations of these technologies. According to the research results, it is necessary to strictly adhere to ethical and legal standards when implementing assessment systems based on artificial intelligence. It was found that it is appropriate to use artificial intelligence as an auxiliary and improving tool, without completely denying the human factor. In the future, an important task is to adapt these technologies to the national education system and develop them based on local data. In general, automated assessment technologies based on artificial intelligence will serve as an important factor in improving the quality of education and training competitive personnel.

In conclusion, the role of automated assessment technologies based on artificial intelligence in education and professional activities has reached a high level. The results of the study showed that artificial intelligence significantly increases the speed and accuracy of assessment processes. Automated systems serve to reduce subjectivity due to the human factor. The importance of machine learning and natural language processing technologies in assessment was substantiated. The effective use of these systems in education, personnel selection and certification processes was determined. At the same time, the problems of data security and algorithmic bias remain relevant. The need to take into account ethical and legal requirements when introducing artificial intelligence into the assessment process was emphasized. The use of artificial intelligence while maintaining human participation is the most optimal approach. In the future, an important task is to adapt these technologies to the national education system. In general, assessment technologies based on artificial intelligence serve to improve the quality of education.

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