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DATABASE MANAGEMENT AND ANALYSIS WITH THE HELP OF ARTIFICIAL INTELLIGENCE

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ABSTRACT

This article discusses in detail the role of artificial intelligence technologies in database management and data analysis. In modern information systems, the processes of storing, processing, and efficiently using large volumes of data are becoming increasingly complex, making the use of artificial intelligence highly important.
The article explains the concept of databases, their main functions, and database management systems, while also analyzing major areas of artificial intelligence such as machine learning, neural networks, and expert systems. In addition, the possibilities of automatic database optimization, rapid data processing, error detection, security enhancement, forecasting, and effective analysis of large-scale data using artificial intelligence are examined.

KEYWORDS

Artificial intelligence, database, data management, data storage, data processing, data analysis, information systems, machine learning, neural networks.

Introduction

Annotatsiya. Ushbu maqolada sun’iy intellekt texnologiyalarining ma’lumotlar bazalarini boshqarish va tahlil qilishdagi ahamiyati batafsil yoritilgan. Zamonaviy axborot tizimlarida katta hajmdagi ma’lumotlarni saqlash, qayta ishlash va ulardan samarali foydalanish jarayonlari tobora murakkablashib borayotganligi sababli sun’iy intellektdan foydalanish muhim omilga aylanmoqda.
Maqolada ma’lumotlar bazasi tushunchasi, uning asosiy vazifalari va boshqaruv tizimlari haqida ma’lumot berilgan hamda sun’iy intellektning mashinaviy o‘qitish, neyron tarmoqlar va ekspert

tizimlari kabi yo‘nalishlari tahlil qilingan. Shuningdek, sun’iy intellekt yordamida ma’lumotlar bazasini avtomatik optimallashtirish, ma’lumotlarni tezkor qayta ishlash, xatolarni aniqlash, xavfsizlikni ta’minlash, prognozlash va katta hajmdagi ma’lumotlarni samarali tahlil qilish imkoniyatlari ko‘rib chiqilgan.

Kalit so’zlar. sun’iy intellekt, ma’lumotlar bazasi, ma’lumotlarni boshqarish, ma’lumotlarni saqlash, ma’lumotlarni qayta ishlash, ma’lumotlarni tahlil qilish, axborot tizimlari, mashinaviy o‘qitish, neyron tarmoqlar.

Аннотация

В данной статье подробно рассматривается роль технологий искусственного интеллекта в управлении и анализе баз данных. В современных информационных системах процессы хранения, обработки и эффективного использования больших объёмов данных становятся всё более сложными, поэтому использование искусственного интеллекта приобретает особую актуальность.

В статье раскрываются понятие базы данных, её основные функции и системы управления, а также анализируются такие направления искусственного интеллекта, как машинное обучение, нейронные сети и экспертные системы. Кроме того, рассматриваются возможности автоматической оптимизации баз данных, быстрой обработки данных, обнаружения ошибок, обеспечения безопасности, прогнозирования и эффективного анализа больших объёмов данных с помощью искусственного интеллекта.

Ключевые слова. искусственный интеллект, база данных, управление данными, хранение данных, обработка данных, анализ данных, информационные системы, машинное обучение, нейронные сети.

Nowadays, as a result of the development of information technologies, the volume of data generated in the world is increasing rapidly. In various organizations, enterprises, banks, educational institutions and government agencies, storing, processing and effectively using large amounts of data has become one of the important tasks. Therefore, database systems are one of the main components of modern information technologies.

Traditional database management systems perform the functions of storing and managing data, but they face some difficulties in quickly analyzing large amounts of complex data. In particular, as a result of the development of Big Data technologies, the flow of data has increased sharply, and the need for their automatic analysis has arisen. In this regard, the use of artificial intelligence technologies is of great importance.

Artificial intelligence allows computer systems to perform tasks such as learning, logical thinking, analysis and decision-making, which are inherent in human thinking. With the help of artificial intelligence, it is possible to automatically manage databases, sort data, detect errors, forecast and ensure security. As a result, the efficiency of systems increases and dependence on the human factor decreases.

Today, artificial intelligence technologies are widely used in many areas, such as the banking system, medicine, industry, trade, transport and education. This determines the relevance of the topic.

A database is a collection of interconnected data stored in a certain order. A database allows the user to quickly find, store and update the necessary information. A database management system (DBMS) is a set of software tools that serve to create, modify, store and manage data. Currently, systems such as MySQL, Oracle, PostgreSQL, Microsoft SQL Server are widely used.

The main tasks of a database are: secure storage of data, fast search, orderly data management, ensuring data integrity and organizing information exchange between users. When working with large amounts of data, simple methods are no longer enough, which is why the need to use artificial intelligence technologies is growing.

Artificial intelligence (AI) is the ability of computer systems and software to perform functions inherent in human mental activity. These functions include learning, analysis, logical reasoning, decision-making, and problem-solving. The main goal of artificial intelligence is to create systems that imitate human intelligence and, in some cases, work faster and more accurately than it.

One of the important areas of artificial intelligence is machine learning, in which computers learn from data without special programming. Neural networks, on the other hand, are based on the principle of the human brain and are used in tasks such as image recognition, speech understanding, and translation. Expert systems, on the other hand, help computers make decisions by introducing the knowledge of a specialist in a particular field into a computer. Natural language processing (NLP) allows computers to understand and analyze human language.

Artificial intelligence performs processes such as automatic optimization, error detection, security, automatic backup, and resource management in database management. It analyzes large volumes of requests and selects the most efficient execution path, identifies incorrect or duplicate data, and strengthens cybersecurity.

In data analysis, artificial intelligence is widely used in forecasting, recommendation systems, medicine, education, and industry. It predicts the future based on historical data, provides users with appropriate recommendations, and facilitates decision-making in various fields.

The advantages of artificial intelligence-based systems are high speed, large-scale data processing, accuracy, security, and automation. At the same time, there are also disadvantages such as high costs, lack of specialists, and security issues.

In the future, artificial intelligence will be further developed by integrating with cloud technologies, Big Data, and the Internet of Things. Automatic decision-making systems and fully automated data management are expected to become widespread. This will ease human labor and take technological progress to a new level.

In short, artificial intelligence technologies play an important role in the process of managing and analyzing databases. They allow for fast and efficient processing of large amounts of data and help achieve high results in various fields.

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