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YANGI O'ZBEKISTON: INNOVATSIYA, FAN VA TA'LIM

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2023

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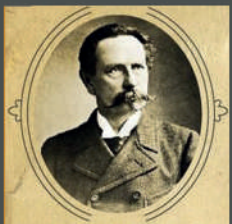
O'ZBEKISTON RESPUBLIKASI VA XORIJIY OLIY TA'LIM MUASSASALARI PROFESSOR-O'QITUVCHILARI, YOSH OLIMLAR, DOKTORANTLAR, MAGISTRANTLAR VA IQTIDORLI TALABALAR



Карл Бенц
1885 год
Германия

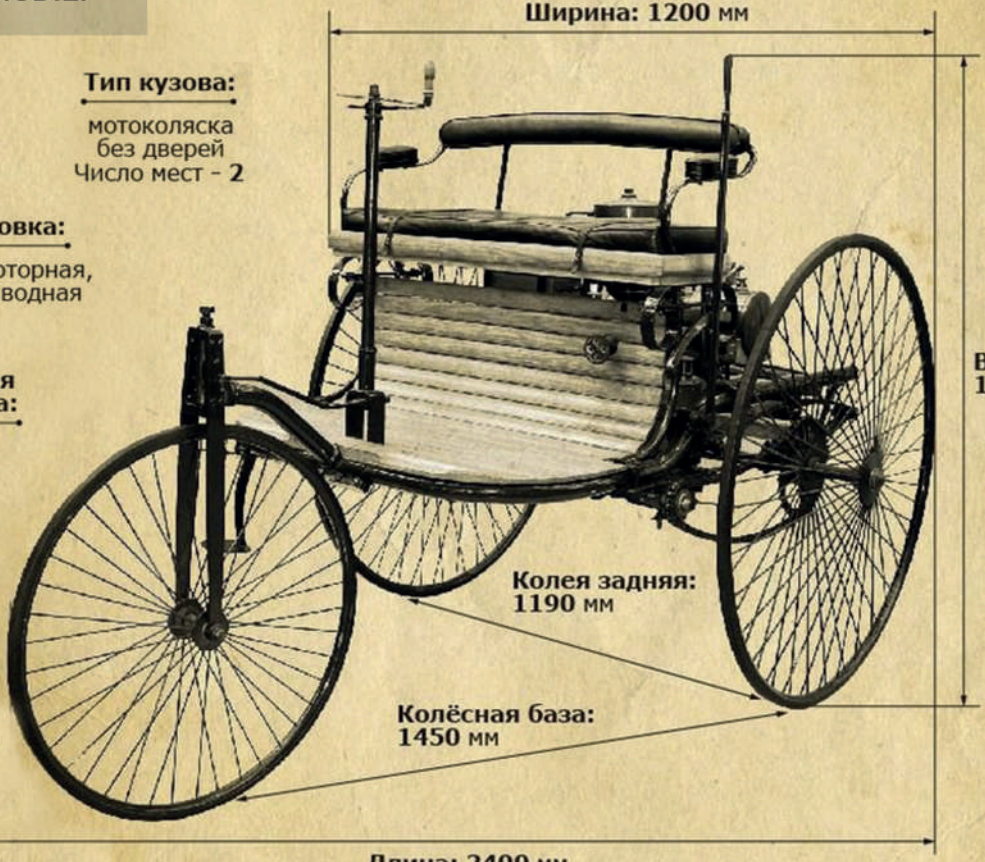
BIRINCHI BENZ AVTOMOBILI

Вид топлива: бензин

Масса: 265 кг

Двигатель: 0,954 L

Мощность: 0,9 л.с.



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ЯНГИ ЎЗБЕКИСТОН: ИННОВАЦИЯ, ФАН ВА ТАЪЛИМ 17-ҚИСМ

НОВЫЙ УЗБЕКИСТАН: ИННОВАЦИИ, НАУКА И ОБРАЗОВАНИЕ ЧАСТЬ-17

NEW UZBEKISTAN: INNOVATION, SCIENCE AND EDUCATION PART-17

ТОШКЕНТ-2023

УУК 001 (062)
КБК 72я43

“Янги Ўзбекистон: Инновация, фан ва таълим” [Тошкент; 2023]

“Янги Ўзбекистон: Инновация, фан ва таълим” мавзусидаги республика 50-кўп тармоқли илмий масофавий онлайн конференция материаллари тўплами, 31 март 2023 йил. - Тошкент: «Tadqiqot», 2023. - 10 б.

Ушбу Республика-илмий онлайн даврий анжуманлар «Ҳаракатлар стратегиясидан – Тараққиёт стратегияси сари» тамойилига асосан ишлаб чиқилган еттита устувор йўналишдан иборат 2022 – 2026 йилларга мўлжалланган Янги Ўзбекистоннинг тараққиёт стратегияси мувофиқ:– илмий изланиш ютуқларини амалиётга жорий этиш йўли билан фан соҳаларини ривожлантиришга бағишланган.

Ушбу Республика илмий анжуманлари таълим соҳасида меҳнат қилиб келаётган профессор - ўқитувчи ва талаба-ўқувчилар томонидан тайёрланган илмий тезислар киритилган бўлиб, унда таълим тизимида илғор замонавий ютуқлар, натижалар, муаммолар, ечимини кутаётган вазифалар ва илм-фан тараққиётининг истиқболдаги режалари таҳтил қилинган конференцияси.

Масъул муҳаррир: Файзиев Шохруд Фармонович, ю.ф.д., доцент.

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ФИЗИКА-МАТЕМАТИКА ФАНЛАРИ ЮТУҚЛАРИ

ФИЗИКА-МАТЕМАТИКА ФАНЛАРИ ЮТУҚЛАРИ

MATHEMATICAL MODELING AND PRACTICAL ISSUES OF INFORMATION TECHNOLOGIES.

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Abstract: Mathematical modeling is the process of creating a mathematical representation of a real-world problem or system. It involves using mathematical concepts, tools, and techniques to describe, analyze, and predict the behavior of the system being modeled. Mathematical modeling has been used in various fields, such as physics, engineering, economics, biology, and social sciences, to name a few. In this article, we will explore what mathematical modeling is, its importance, and its applications.

Key words: mathematical modeling, social interactions, mathematical techniques, physical system.

Indroduction

Mathematical modeling is the process of using mathematical concepts and tools to represent and analyze real-world systems or processes. The goal of mathematical modeling is to create a simplified, abstract representation of a complex system that can be studied and analyzed mathematically.Mathematical models can be used to explore a wide range of phenomena, including physical systems, biological processes, economic systems, and social interactions. For example, a mathematical model of a physical system might describe the movement of a fluid through a pipe, while a biological model might describe the spread of a disease through a population.The process of mathematical modeling typically involves several key steps, including:

Identifying the problem: This involves defining the system or process that needs to be modeled and identifying the relevant variables and parameters.

Formulating the model: This involves creating a mathematical representation of the system, often in the form of equations or algorithms.

Solving the model: This involves using mathematical techniques to solve the equations or algorithms and obtain numerical solutions.

Validating the model: This involves comparing the results of the model to real-world data to ensure that it accurately represents the system or process being studied.

Mathematical modeling and information technologies (IT) are closely linked, as mathematical models are often used to develop and optimize IT systems and applications. However, the practical issues of IT can also present challenges for mathematical modeling, and it is important to consider these issues when developing and applying mathematical models in IT.One practical issue in IT is the availability and quality of data. Mathematical models rely on accurate and reliable data to produce meaningful results, and the quality and quantity of data can vary widely in IT applications. For example, data may be incomplete, inconsistent, or biased, which can affect the accuracy and validity of mathematical models. It is important to carefully evaluate and preprocess data before using it in a mathematical model to ensure that it is appropriate and reliable.Another practical issue in IT is the complexity and scale of systems and applications. There are many different types of mathematical models, each with its own strengths and weaknesses depending on the specific problem being addressed. Some common types of models include:

Deterministic models: These models use precise mathematical equations to describe the behavior of a system. They are typically used when there is a high degree of certainty about the underlying mechanisms of the system being studied. Stochastic models: These models

incorporate randomness or uncertainty into the modeling process, and are typically used when there is a significant degree of uncertainty about the system being studied.

Agent-based models: These models simulate the behavior of individual agents within a system, and are used to study complex systems with many interacting components.

Optimization models: These models are used to identify the optimal

Mathematical modeling is not without its limitations and challenges. One key challenge is the need for accurate and reliable data to inform the modeling process. In addition, mathematical models are often based on simplifying assumptions that may not accurately reflect the complexities of the real-world system being studied. As a result, it is important to carefully evaluate and validate the results of a mathematical model before using it to inform decisions or make predictions.

What is Mathematical Modeling?

Mathematical modeling is the process of creating a mathematical representation of a real-world system or process. This representation can be in the form of equations, algorithms, or computer simulations. The goal of mathematical modeling is to understand the underlying principles and behaviors of a system and make predictions about its future behavior.

Benefits of Mathematical Modeling

There are several benefits to using mathematical modeling:

Better Understanding: Mathematical modeling helps researchers and practitioners to understand the underlying principles and behaviors of a system. By creating a mathematical model, they can explore how different variables and parameters affect the system’s behavior.

Predictions: Mathematical models allow us to make predictions about the future behavior of a system. By simulating different scenarios, we can predict how a system will behave in different conditions.

Optimization: Mathematical models help us to optimize systems by finding the best set of variables and parameters that will achieve a desired outcome. For instance, in engineering, mathematical models are used to optimize designs and processes to maximize performance.

Conclusion

Mathematical modeling is a powerful tool used to understand and predict the behavior of complex systems. It has a wide range of applications in various fields, including engineering, physics, biology, and economics. By creating a mathematical model of a system, we can better understand its underlying principles, predict its future behavior, and optimize its performance. Finally, IT systems are subject to a wide range of constraints and limitations, including resource constraints, security concerns, and regulatory requirements. Mathematical models need to take these constraints into account when developing and optimizing IT systems, to ensure that they are feasible and practical to implement.

Developing mathematical models:

Define the problem: The first step in developing a mathematical model is to clearly define the problem you are trying to solve. This involves understanding the system or process you are studying, identifying the key variables involved, and defining the objectives of your model.

Choose a modeling approach: Once you have defined the problem, you need to choose an appropriate modeling approach. This will depend on the nature of the problem and the type of system you are modeling. Some common modeling approaches include differential equations, linear and nonlinear programming, and statistical modeling.

Formulate the model: Once you have chosen a modeling approach, you need to formulate your model mathematically. This involves translating the problem into a set of equations or algorithms that can be solved using mathematical methods.

Validate the model: Before you can use your model to make predictions or optimize a system, you need to validate it. This involves comparing the results of your model with real-world data and ensuring that it accurately represents the system you are studying.

Use the model: Once you have validated your model, you can use it to make predictions or optimize the system you are studying. This involves running simulations and analyzing the results to gain insight into the behavior of the system.

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ЯНГИ ЎЗБЕКИСТОН: ИННОВАЦИЯ, ФАН ВА ТАЪЛИМ 17-ҚИСМ

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