Volume 3, Issue 4, April – 2025 **ISSN (E):** 2938-379X

THE ANALYTICAL DYNAMIC MODEL OF THE STRUCTURE OF THE INFORMATION SYSTEM CONDITION

Begimov Oktam Ibragimovich
The Head of the Department “Digital Technologies” of Alfraganus University
uktambegimov24@gmail.com

Jovliyev Ulugbek Davronovich
The Master of the faculty of “Digital Technologies” of Alfraganus University

Abstract
The article describes the mathematical expression of the dynamic characteristics of the transmission properties of the object represented by the line he selects automatic control systems using real input and output variables and output variables of abstract types kosh represented by the differential equation.

Keywords: Information systems, selects the automatic construction metho intelligent, data mining, process your data, model evaluation and optimization, security, protection against unauthorized access, types of dynamic models, input-output and input-state-output model.

Introduction

ACCESS

Facilities management and the system dynamic model of the two main type of toe‘lish: the “entry-exit” and “entrance-condition-out”. “Entry-condition-out” type of the model state space model is also referred to.

Always save important information with information systems management and access them gardenliq. Access models to identify (LESS) to protect against unauthorized access to this system from the attack plays an important role in the prevention of and rise. In this article, the information entered in the system to determine the method for the construction of the model is the analysis of modern smart automatic.

Information systemsto o‘zgaruvchan analytical - type dynamic models is characterized by linear differential equations. The differential equation for determining the transfer function of the object from the Laplas (Fure) operator image sharing methodology‘is llab. Differential equations and their dynamic and frequency characteristics of the system through zveno particular image and you can build.

The two main types of access into the model to determine toe‘linadi: signed, based on the abnormalities based. Sign on the working model on the basis of pre-determined rules and access the activity using signatures analysis. On the contrary, the abnormalities based models, aside from the actions will determine out normal activities.

In control theory for the description of the dynamic system “access-status-output” or “input-state-output” (JESUS) enters the system the type of the model ta‘secrets, information about the internal condition of the system and the exit value o‘z includes. This is the only model to characterize and represents more than access to them.

First of all, the model sothat we have given it a worthy definition of the genre “module” derived from the word is, measure, moderation means. This model in a broad sense any weather’yor a welcome addition to the weather’y -system, neither a welcome addition to’munasidir. Moddiyat using mathematical models, the economy, the nation ho‘jalik production and weather’yand a welcome addition to the processes in them can be observed. This modeling concept is called. Mathematical modeling – in this area it or not the processes that night equations, inequalities, and functional logik through the scheme is understood to represent.

Analysis of the relevant literature as a source

The problem methodology‘be the year of

Bosqaruv in the development of mathematical models of information systems methodology‘is llab. This salt model of the subject areaof the main items and sub ilma’a welcome addition to the qonuniyat are in the element and to determine the relationship of information to optimize the system boundary and the main criteriaof the world separate ko‘rsat will help. This is relevant to the eh. Document information system on the issue of managing the construction of toe‘of the present mathematical model can bring the following types: set theory, theory graf, automatic, functional, deskriptor. Now her out of the analysis of a mathematical modelrilgan.

Much theoretical part of the balance of the issue

“Entry-condition-out” the basic concept of the model

1. **Access (Input, it):** the system units‘secret data access. Managing these various signals or external units‘secret toe‘can lish.
2. **Condition (State, x):** the current status and dynamics of the system to‘liq descriptive internal condition. Cases are usually the first orderly equations_package is determined.

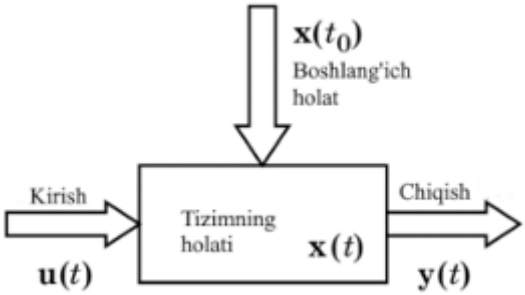
3. Out (Output, y): a system of incoming units‘secret of reaction. Out o‘the toe of the desired behavior of the system parameters or lchangan_can lish.

About the future state of the system or object ma‘lumot and out o‘the toe of zgaruvchan able to determine‘lish an opportunity will arise from the use of the space in the condition required model type. The weather’by the model represent the space in the link condition yek way too linear, too linear toe‘I lmas systems methodology‘can be llab.

Description: System status – ma‘lum o a‘network zgaruvchan‘toe package‘become to know them to characterize the dynamics of the system o access_zgaruvchan of functions and equations together with the information about the state and its future, out o‘zgaruvchan allows the user to determine (1960-y. I am bald)[1.2].

To‘the theory of the package models.

O the condition or position vector of the dynamic system‘zgaruvchan to the‘package $x_1(t), x_2(t), \ldots, x_n(t)$ and this is characterized by‘package, the system displays the current status of all external influences certain toe‘lsa, the future movement of the system (mode)defines the select.



1-picture. Data entry and output parameters of the system are given.

O_zgaruvchan of the vector $y(t) = (y_1(t), y_2(t), \ldots, y_{m,}(t))$ and o access‘zgaruvchan of the vector $u(t) = (u_1(t), he_2(t), \ldots, he_r(,t))$ toe‘the present system ko‘sits out (1-picture).

For the given system $x(t) = (x_1(t), x_2(t), \ldots, x_n(t))$ o condition‘zgaruvchan the vector have the following meaning: start‘constipation moment t_0 at $x(t_0) = (x_1(,t_0), x_2(t_0), \ldots, x_n(t_0))$ and the value of $t > t_0$ o access for‘zgaruvchan of $it_1(t), he_2(t), \ldots, he_r(t)$ clear toe‘lsa without all of this information in the status o‘zgaruvchan of $x_1(t), x_2(t), \ldots, x_n(t)$ and $t > t_0$ toe‘at present out o‘zgaruvchan of $y_1(t), y_2(t), \ldots, y_m(t)$ to determine the value of the future enough. For example, two “switched on” or “o‘chirilgan”, the value is equal to one toe‘condition present condition of the bulb vklyuchatelining o‘the toe of zgaruvchan‘can lish. We t_0 and in that case how we can know him at the time vklyuchatel external influences, then we can determine the exact condition of the object in the future.

From the mathematical aspect of the information on the condition, that is, JESUS is characterized by the following equations models:

1. Condition equations

$$x_1(t) = Visit(t) + It(t)$$

Here: $x(t)$ - condition vector,and $u(t)$ – vector to access the A – condition matrissasi $(n \times n)$, B – access matrissasi $(n \times m)$.

2. Out of the equation:

$$y(t) = Cx(t) + Du(t)$$

Here: $y(t)$ - out vector, C - matrisa out of (o‘lcham of p×n), D – to‘g‘settings ko‘to rot matrisa of (o‘lcham of p×m).

Jesus is the model methodology‘to llab

Information, the analysis of the modeli automatic flight control systems, modeling and analysis of processes and systems for the synthesis of identification is used.

Information "entry-exit" model the model of jesus o'- check-in process, passengers [2]

1. Transfer function: the system was initially the incoming signal , $It(s)$ and output signal $Y(s)$ to the garden'for servicing the official delegations $of\ g(s)$ will be described by the transfer function:

$$G(s) = \frac{Y(s)}{He(s)}$$

2. General transfer function ko'rinib have:

$$G(s) = \frac{b_0 s^m + b_1 s^{m-1} + \ldots + b_m}{a_0 s^n + a_1 s^{n-1} + \ldots + a_n}$$

b_i and a_i – ko'phad the factor of the n - system procedure, i.e. the denominator of the level, m - level of the image (usually $m \leq n$).

The transfer function equation is the condition o'- check-in passengers on to the second example o level'function-check-in passengers ko'let's sits:

$$G(s) = \frac{Y(s)}{He(s)} = \frac{2s + 3}{s^2 + 4s + 5}$$

1. Be the writing of differential equations:

Following time in the field of transfer function corresponds to the differential equation:

$$s^2 Y(s) + 4(s) + 5(s) = bozsu\ 2(s) + 3(s)$$

The time sphere o'after moving in, we get the following result:

$$\ddot{y}(t) + 4\dot{y}(t) + 5(t) = 2\dot{i}t(t) + 3(t)$$

2. Condition o'zgaruvchilarini you can determine:

$$x_1 = y(t), \qquad x_2 = \dot{y}(t)$$

More:

$$\dot{x}_1 = x_2, \qquad \dot{x}_2 = \ddot{y}(t)$$

3. Condition equations:

Using the initial equation $\dot{x}_2$we can express follows:

$$\dot{x}_2 = 2\dot{i}t(t) + 3\ and(t) - 4y(t) - 5(t)$$

Condition o'zgaruvchan in terms of x_1 and x_2:

$$\dot{x}_2 = 2\dot{i}t(t) + 3\ and(t) - 4x_2 - 5x_1$$

Thus, you will be able to condition the following system of equations:

$$\begin{cases} \dot{x}_1 = x_2 \\ \dot{x}_2 = -5x_1 - 4x_2 + 2\dot{i}t(t) + 3(t) \end{cases}$$

Usually it is possible to simplify the equation(t) of the incoming signal surge o'z o covering the new'zgaruvchan is included.

Ma'lumot and pre-processing. Yig'births ma'lumot must be processed in advance. In this process, remove noise, and divide features as normalizatsiyaactions I performed. Ma'lumot the 'tog'ri that ta'enter minlash to determine the effectiveness increases.

Build the model. Automatic model building process, the machine o'to rga (MO) and deep learning (CO) from the algorithm uses. For example, decision trees, neuron networks, and other

algorithm to determine a model that you can create into using. This algorithm ma'lumot the 'tolearn from the package, allows to forecast the future behavior prior.

Evaluation and optimization of the model. Built to assess the effectiveness of the model, test it ma'lumot tested with o'- check-in passengers is required. The results of the assessment onthe optimization of a model, ya'preference o'zgarib and is done to improve the algorithm. This process automatically o'zgarib can be.

Smart methods

1. The machine o'to rga. Car o'rga models to determine the access of using the algorithm to automate the process of creating it. This algorithm is based on the previous information, respond to add new o'rga will.
2. Deep o'to rga. Deep o'the use of technology effective in identifying the complex behavior of rga. Model networks using neuron abnormalities and determine whom you can build them accordingly finds doing so.
3. Based on the results o'to rga. In this method, the results of the model from o'rga using allows us to develop new strategies. Based on the results o'rga will update itself to the process model on a constant basis.

SUMMARY

"Entry-condition-out" (JESUS) analysis is a powerful tool for imaging and dynamic models of the system type. They pull the economy from engineering to toe'present methodology is in different areas'llab and allows modeling of complex processes. This model of the system, the external units'secrets, furthermore, also takes into account domestic situations.

"Entry-exit" the situation is very dynamic phase of the critic model type of model (equation condition) o'- check-in process, passengers transfer function of the system or log out and rise to the garden_the official delegations for servicing the system of equations that characterize the dynamics of the internal conditions of the system of differential equations is provided to convert. This process model space to cases o'- check-in passengers (state space representation) is called.

Information entered in the system model to determine the construction of strategic security is an integral part of modern automatic. In this article, methods of analysis, for example, machine o'rga and deep learning, the activities of unauthorized access detection and effective in the prevention of access development offers great opportunities. The process of model building ma'lumot the 'tostart the plab them from processing, modeling and evaluation includes a number of stages which are.

Automatic build the smart method not only increases productivity in the process, but the system also enhances safety. Further development of this method in the future, as well as real-time methodology'llab information will help you to enhance the security level of the system. Thus, the access model to identify and develop them, and the strengthening of the defense of the update process of the information system is important in toe'ladi.

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

References

1. Kudinov Yu. I. Patshenko F. F. (2016) avtomaticheskogo upravleniya any theory (s ispolzovaniem MATLAB — SIMULINK): Uchebnoe posobie. — Sp has.: Izdatelstvo "Lan", not 256.
2. Igamberdiyev X.Z., Sevinov J.It. (2018) Management theory. Ou a s the textbook. -T.: “science and technology”, has 336.
3. Bishop, c. m., pattern recognition and machine learning. Spring, 2006.
4. Goodfellow, I., Bethe ngi, Y., & Courville, A. deep learning. MITCH Press, 2016.
5. Hodgan v. j., & Austin, J., “a survey of outlier detection methodologies,” artificial intelligence Review, 22(2), 2004, 85-126.
6. Recognize, P. N., Steinbach, M. & Kumar, V. (2019). Introduction to data mining. Pearson.
7. Zh, Z.-H., Metho ensemble: foundations and Algorithms. Crc press, 2012.
8. Sommer, P., & paxsa, v., “close to the outside world: on using machine learning for network intrusion detection”, IEEE european symposium on security and privacy, 2010, 305-320.
9. Li, W., & Li, K., “detection of anomal based on deep learning: a survey”, international journal of information Security, 17(6), (2018), 599-619.
10. Ahmed, M., Mahmood, N. A., & Hug, J. (2016). “A survey of network anomal detection techniques”, Journal of network and computer Application, 60, 201-217.
11. Do not zh, Y., & most zh, Y.,“a deep learning approach for intrusion detection”, Journal of information security and Application, 42, (2018) 150-157.
12. Kulli, M., & Flach, P., “beyond accuracy, F-measure, the lack of consistency and the importance of being precise”, machine learning, 95(2), (2014), 203-234.

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1