

and to be transferred the efforts on their walls; it allows the plastic substances and the materials to be introduced in any volume; it can regulate the application temperature regime, being used in combination with the different and the various additives; it provides the best technical and the sanitary conditions of the works performance.

The work is submitted to the International Scientific Conference «Problems of international integration of national educational standards», France (Paris), 15-22 March, 2012, came to the editorial office on 13.01.2012.

USING OPTIMIZATION METHODS SOME NONLINEAR MODEL

Zhunussova L.K.

Kazakh National Pedagogical University named after Abai, Almaty, e-mail: khafizovna_66@mail.ru

The World of the mathematical models of the phenomena's of the a live world inexhaustible, either as world of the living beings itself. However as in biologics as united theory emerges the theories to molecular biology and evolutions, revealing unity to generalities of the biological phenomena's, so and in biomathematics gradually drawn the general approaches, which will reveal essence main mechanism biological processes, acta a sing powerful ally to experimental biology.

To persisting moment mathematical methods got into most area miscellaneous theoretical and applied ecology: analysis of the relations type in community, study of the processes to migration, territorial behavior, analysis flow material and energy in ecosystems, problems to difficulties and stability community, estimations of the influence different anthropogenous factor on natural systems, problems optimum exploration populations.

At modeling ecological and other natural systems we face with the following circumstance: than for big period necessary to predict importance a parameter conditions surrounding ambiances under fixed accuracy of their description and upper frequency of the smoothing, that greater number interacting processes to us necessary to take into consideration at study of the operations.

The principle optimality pertains to biological process, which is formulated as follows: biological structure or process must be optimum to the extent that that alive organisms, staying it is enough long-lasting time in determined condition, as a result of actions of the natural selection must gain the signs optimum for these conditions.

The processes, occurring in nervous system animal under that or other its action, possible research with different standpoint. Possible consider functioning the concrete structures of the brain, distribution agitated and dullard neuron in them. Possible, however, expect that all this only facility for

realization of the certain procedures, providing as a result that or other behavior animal.

The processes in nervous system can have different physical, biochemical or the other nature. Each of they are realized certain physical controlling system.

Three types distinguish at study behavior:

- 1) instincts;
- 2) reflexes;
- 3) elementary rational activity.

Here the most typical characteristic to elementary rational activity animal is their ability to catch protozoa laws surrounding ambiances and handle these law at building of the algorithm of the behavior in new situation.

Greatly herewith that behaviour, founded on elementary rational activity, is seen already under the first meeting the organism with extraordinary situation, created in ambience its dwelling.

The problem speakers to number to populations occupies the special place in mathematical modeling of the biology.

Any ecosystem consists of population of one type, chosen in space that or other insulating barrier, which interact between itself, as well as surrounding their ambience. Most idle time description to populations – a description speakers to its number or biomasses forming its organism.

When we move to level экосистемы, that we produce the simplifying operation: we describe the speaker a community through speaker of the number or biomasses forming its populations. In spite of the fact that these values discrete, we their consider unceasing and describe their speaker unceasing value available continuously at time and in space. Certainly, such description there is abstraction, and we risk to lose some real existing characteristic of the system.

The Analytical models do qualitative information on behavior, about nature of the operation biological community and ecological systems. But these models in a complicated way to require that they gave the quantitative forecast of the behavior real ecosystem.

Correlation is shown In work between physical controlling system and their mathematical model, so named controlling system – one controlling system can be described whole class different physical controlling systems [1].

Herewith, important importance for ecology and practical problems to usages and governing the population has a study speakers age composition to populations [1].

The quantitative nature struggle for existence reveals itself in given ambience in the manner of change the number individual, forming population miscellaneous. Under one condition of these change consist of fluctuation around average importances, under the other condition it is reduced to disappearance or progressing increase some type. Of course, exists periodic changing condition of the ambience,

hanging from time of the year, which generate the compelled fluctuations to number individual different type [2].

In persisting work is researched track record of the models ecosystem. by means of optimum management with provision for factor delay. In this instance functional Bolts' special type is formed with participation first integral unadjusted part of system with delay:

$$\frac{dx}{dt} = f(x(t-h), t) + B(x, t)u, \quad t \in [t_0, T]. \quad (1)$$

The initial condition of the system is given:

$$\frac{dx}{dt} = f(x(t-h), t),$$

где $x - n$ – measured vector of a condition; $u - m$ – measured vector of management; $f(x(t-h), t) - n$ – measured vector function; h – delay factor; $B(x, t) - n \times m$ – matrix. On management $u(t)$, $t \in [t_0, T]$ following restriction is imposed:

$$|u_j(t)| \leq M_j, M_j = \text{const} > 0. \quad (2)$$

Necessary to find such operated $u(t)$, $t \in [t_0, T]$ vector-function, satisfying restrictions (2) which minimized functional Bolts'.

The decision given problems is concluded in determination importance functions of management in analytical type. For this use the method, offered in work [3, 4, 5].

Historically application of the mathematical methods in ecologies contained basically dynamic

theory population, which, having begun with use the device of the common differential equations, handles presently all facility to modern theory of the dynamic systems.

References

1. Kolesov A.J. Relaksacionnye fluctuations in mathematical model ekologii // Trudy MIRAN. – M.: Nauka, 1993. – P. 6-72.
2. Volterra V. Mathematical theory fight for existence. – M.: Nauka, 1976. – 288 p.
3. Bajgelov K.Z., Biarov T.H., Zhmagulov B.T. Optimization of the biological system at presence restriction on management. – Almaty: the Preprint of news RK 1993. – №4. – 23 p.
4. Biarov T.N., Zhunussova L.K. Reports national academy of sciences Kazakhstan. – 2005. – №2. – P. 54-59.
5. Zhunussova L.K. Mathematical journal. – 2010. – Vol. 10, №1(35). – P. 47-51.
6. Mathematical theories of optimal processes / L.S. Pontryagin, V.G. Boltyansky, Z.V. Golikrelidze, E.F. Mischenko. – M.: Science, 1976. – 392 p.
7. Smagulov S.S., Biarov T.N., Baigelov K.Z. Synthesis of optimal systems of management with the limited resource // Vestnik AS KazUSR. – 1991. – №2. – P. 63-69.
8. Bellman R., Glinsberg I., Grosse O. Some problems of the mathematical theory of processes of board. – M.: IL, 1962. – 336 p.
9. Karmanov B.G. Mathematical programming. – M.: Nauka, 1975.

The work is submitted to the International Scientific Conference «Computer simulations in science and technology», Andorra, 9-16 March, 2012, came to the editorial office on 07.02.2012.