ABSTRACT

Urgency of the research. The development of information technology has caused an increase in the need for simulation modeling of complex systems intended to determine the optimal management and decision-making parameters. Simulation models are not only used at the design stage but also as an integral part of information systems. This leads to the emergence of special model requirements related to ensuring the speed of their construction and obtaining simulation results. The speed of modification due to structural and functional changes and the ability to integrate with other information technologies become important properties of a model.

Petri-object modeling is a simulation modeling technolody based on stochastic Petri nets which allows to create models of complex systems with structural elements. Unlike other known simulation modeling technologies, the Petri-object technology is based on a formalized description of the dynamics of a system with a Petri net. This allows to achieve the most abstract and yet the most detailed description of the functioning of a system.

In this regard, the development of an efficient software for Petri-object model visual programming is a topical scientific problem.

The aim of this research is to speed up the construction of models of complex discrete-event systems and to improve the usability of their visual representation.

To achieve this aim the following **tasks** must be done:
- review known discrete-event system automated simulation modeling tools;
- examine the technology of Petri-object modeling, perform its comparative analysis with other discrete-event system simulation modeling technologies;
- review existing modeling tools based on Petri nets, search for tools that allow to perform Petri-object model visual programming for later use in simulation modeling;
- decide on the visual representation of Petri net elements and Petri-objects in the prospective visual programming system for Petri nets and Petri-object models;

- design this system using the simulation algorithms for Petri-object models and simple stochastic Petri nets;
- implement the software for the designed system;
- test the system with specific models;
- analyze the accuracy and performance of the created software.

Object of study: the process of visual programming of models of complex discrete-event systems.

Subject of study: means and methods of visual programming of models of complex discrete-event systems based on the Petri-object formalism.

Research methods: fundamental provisions of mathematical (simulation) modeling, general scientific principles and research methods including analysis and synthesis, decision-making methods in the field of architecture design, systematization, abstraction, structuring methods for evaluating existing simulation modeling tools.

STOCHASTIC PETRI NET, SIMULATION MODELING, DISCRETE-EVENT SYSTEM, PETRI-OBJECT MODEL, VISUAL PROGRAMMING.