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## Kvinto Ya.I., Khlebnikov M.V.

The linear dynamic system is considered in the presence of uncertainty in its matrix. Upper estimates of deviations in linear dynamic systems are obtained on the basis of linear matrix inequalities technique, and the problem is investigated of deviations minimization in linear control systems by means of static linear state feedback. Numerical simulations demonstrated the low degree of conservatism of the estimates obtained.

**Keywords:** linear dynamic system, uncertainty, linear matrix inequalities, large deviations, Lyapunov function.

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#### Klochkov V.V., Rozhdestvenskaya S.M.

The analysis is conducted of the impact of financial support in the form of grants for youth on the effectiveness of the selection of more able scientists. The influence is evaluated of the scientist financial security on a time he can devote to science, on his performance during the period of grant support and, ultimately, on the quality of the scientists' selection on the basis of their ranking. The requirements for the level of grant support are determined. The impact of the duration of the scientists' support and performance monitoring period on the selection quality is assessed. The desirable time and cost parameters of young scientists grant support are determined.

**Keywords:** development management, grants, young scientists, life cycle, productivity, ranking, efficiency, errors of the first and second kind.

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The task is considered of determining the amount of financing for several jobs constituting the total production order. The contractor of each job is a monopolist in a respective field and has no competitors. Tasks financing funds are given. Mechanisms are investigated providing the true information acquisition on the cost of each job fulfillment.

**Keywords:** costs, profit, profitability, cash advance.

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## Podlazov V.S.

The system-area network is proposed in the form of nonblocking three-dimensional generalized hypercube. The new hypercube structure is designed and the algorithm is suggested for it of conflict-free making of direct paths between the nodes by the means of self-routing in them.

**Keywords:** system-area network, generalized hypercube, complete multiring, switching features, nonblocking network, conflict-free self-routing, direct paths.

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Keywords: digital system, fragment, abonent, commutator, communication line, minimal quasicomplete graph, controlling test, special test.

## CREATION OF INFORMATION-TECHNOLOGICAL RESERVE IN DISTRIBUTED DATA PROCESSING

### Somov S.K.

The main stages are presented of creating an information-technological data reserve in distributed automated informational control systems. The reserve is formed on the basis of the results of the analysis of user domains, regular requests to the system and the analysis of the execution sequence of queries processing procedures. The tasks are set of the reserve structure design and of the optimal allocation of reserve copies among computer network nodes. It is noted that this type of reserve allows reducing the processing time of typical, regular requests to the system due to the fact that the reserve contains the data sets, prepared beforehand and later used at requests processing.

**Keywords:** distributed data processing system, computer network, information-technological reserve.

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#### Babaev D.I., Poletikin A.G., Promyslov V.G., Timofeev M.Yu.

Considered are the methods of risk assessment, cybersecurity levels assignment, the requirements to protection measures and to cybersecurity architecture design. The main tasks are formulated of ensuring the cybersecurity. The principles are outlined of constructing the security architecture. The concrete example of the practical implementation of the security architecture is discussed.

**Keywords:** information, cybersecurity, security, automated control systems, nuclear power plant.

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## Rezchikov A.F., Tverdokhlebov V.A.

The method is developed of constructing the rules of controlling the interactions between complex system functioning processes. Processes are considered as sequences of cause-and-effect related events, specified using their properties indicators values. The structure of control rules is presented on the basis of the recurrent and first introduced Z-recurrent definitions of sequences in the form of functional dependencies of the event properties indicators values. It is noted that the models developed of the events, processes and complex system functioning are applicable on the whole when solving the problems of control, monitoring, and diagnosis.

**Keywords:** functioning of complex system, process, event, control rule, recurrent and *Z*-recurrent definition of sequence.

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#### Zhilyakova L.Yu., Kuznetsov N.A., Matiukhin V.G., et al.

The paper is devoted to the formal statement and solution of a problem arising when assigning the locomotives for freight transportation realization in accordance with preset schedule. The goal is to determine whether the number of locomotives is sufficient at a specified initial allocation of them to perform all transport operations. The solution is presented in the form of an algorithm that builds the coverage of the schedule: the complete one, if it exists, or else the partial one being the maximal independent. The theorem is proved on one-to-one correspondence between the existence of the complete coverage and the sufficiency of the number of locomotives.

Keywords: graph model, network flows, locomotive assignment, freight rail transportation.

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