
SCIENTIFIC SCHOOL «MODELING AND ANALYSIS OF SAFETY AND RISK IN COMPLEX SYSTEMS» - ACTUAL APPROACH TO ACTUAL PROBLEMS

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All wise men should be in a dialog
Titus Maccius Plautus (254–184 B.C.)
Roman comedy writer

Dear colleagues !

We are living in interesting time, in period of global changes all sides of human life: economics, politics, environmental conditions, ideologies, ideals, culture and cultural wealth.

Scientific and technological advance grows rapidly, obtaining of new knowledge increases twice every ten years. 80% per cent of all scientists, who lived ever on Earth, are our contemporaries. Every minute 2000 pages of new knowledge are added to scientific heritage. To study these materials we need to read it uninterruptedly during 5 years. About 500 thousands new books are published every year.

The development of information technology, communications and Internet has a great influence on knowledge industry's growth because information plays important role. Well-timed information allows understand modern trends in development of economics, science and society, follow newest discoveries and elaborations, make correct decision in changeable conditions.

Therefore, bridging of scientists, researchers and developers is extremely important task and scientific conferences and symposiums are best means for communication between members of scientific society.

Of course, the main source of information where modern scientists get actual information about newest developments and research results is periodicals and Internet, but, it's needed to note, papers, which are published in periodicals (especially in reviewed ones), as a rule, contain finished research with final results. On the other hand, conference gives unique chance to study a work at initial stage of its research and understand tendencies of modern science at their beginning. Scientist can be informed at first hand about last developments, not described in periodicals, and who and in what research is engaged at present, pick up new interesting ideas.

Besides, lively productive talk with author of new approach or new method is more productive for disputants than one-sided examination of his (her) work in journal or another periodicals, where the volume of the paper and rules of publishing usually are limited by requirements of publishers.

Scientific School «Modeling and Analysis of Safety and Risk in Complex Systems» (MASR) is held annually since 2001 in Saint-Petersburg with financial support of Russian Fund for Basic Research (RFBR). Traditionally, there are two sections: "Risk in Engineering and Ecology" and "Risk in Economics and Finances".

Every year scientists and specialists from more than 15 countries arrive in Saint-Petersburg to make a lecture, meet colleagues, put questions and get answers, to discuss perspectives of the collaboration.

Scientific School (MASR) is focused on actual problems of quantitative estimation and analysis of risk and safety in various areas of business and engineering. Scientists and specialists in nuclear power engineering, navy, aviation and space vehicles, economists from investment companies, financial institutions, banking and business are taking part in the School.

During holding of eight Scientific Schools MASR in period 2001-2008 years more than 500 scientist from 34 countries have took part. More than 650 scientific papers were published in eight MASR Proceedings.

Idea of holding of Scientific School «Modeling and Analysis of Safety and Risk in Complex Systems» have appeared for a good reason. Russian scientists, leading specialists in reliability theory and safety theory for complex systems, K.V. Frolov and I.A. Ryabinin have initiated MASR.

Idea of MASR was been supported by director of Institute of Problems of Mechanical Engineering of Russian Academy of Sciences (RAS), Doctor in Technical Science Vladimir Pavlovich Bulatov (1937–2002), Corresponding Member of RAS Nikolay Andreevich Machutov and Academician of RAS Konstantin Vasilevich Frolov.

Too many specialists were engaged in area of estimation and analysis of risk in technical and economical systems but they worked in isolation. Many unique developments and decisions remained in closed laboratories, departments and companies and were not available to anybody. Scientific School was organized to get possibility for scientists to share experience with world scientific society and for other scientists to study these developments.

First School MASR–2001 was held in June 18–22, 2001 in Institute of Problems of Mechanical Engineering of RAS and Saint-Petersburg Institute of Informatics of RAS with financial support of RFBR and had excellent success. Actual problems of estimation and analysis of risk were discussed and ways to solve these problems were offered.

However, MASR have become popular not only among specialists, engaged in specialized problems. In MASR topics new problems were opened, which were actual at the end XX – beginning XXI centuries not only in engineering but in economics and business also.

Topics of the School involve problems of the capital market risk, including market risk, security portfolio risk, operational risk, credit risk. Methods of modeling and analysis of the risk in engineering, development of quantitative risk analysis methods, optimization of risk models, distribution of resources to risk management, are discussed. The problem of risk analysis and efficiency of social and economical processes under statistical data is formulated. Two types of events are distinguished; the appearance of system's state and failure of system's state.

Today, main goal of International Scientific School is a chance for scientists and specialists to share results of their theoretical and practical research with colleagues in area of modeling and analysis of risk, and, to establish interdisciplinary connections for development of universal risk theory.

Other goal of International Scientific School is introduction of mathematicians, economists and managers to logical and probabilistic theory of the risk with groups of incompatible events in problems of the classification (credits), investment (security portfolio), efficiency (social processes), management of the company, corruption and bribes; consideration of the connection of databases and knowledge bases in above-mentioned problems, transition from VaR models to logical and probabilistic models of the risk of classification.

Great benefit of Scientific School is the possibility to learn newest developments in methods of estimation, analysis and management of risks. Works, presented at Scientific School, give some participants new ideas for Ph.D. thesis and thesis for a Doctor's degree. With using of results of presented works, several Ph.D. thesis and thesis for a Doctor's degree were written and successfully defended. MASR participants have written also several scientific monographs.

It's necessary to note, the scientific importance of papers, presented by participants, is high enough and annually increasing. In July, 2003 the special issue of the known scientific reviewed journal "Automation and Remote Control" № 7, vol. 64, was published. This issue contains selected MASR papers that were published in 2001-2003 years.

At present moment we are glad to offer you selected MASR papers that were published in MASR Proceedings during period 2001-2008 years.

In conclusion, we are very thankful to MASR participants those valuable material was used as a basis for this issue, and to all our participants for their interest and activity. Also, we are very appreciate to organizers of e-forum Gnedenko and Alexander Bochkov personally, who provide good information support and promotion of Scientific School MASR.