

Yuri Ermoliev

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Dr. Ermoliev graduated from Kiev State University, Department of Mathematics in 1960. He received his Ph.D. in applied mathematics in 1964 from the same university. Dr. Ermoliev was the recipient of the State Award in Science of the Ukraine (1978) and the State Award in Science of the USSR (1981). He has been a Member of the Ukrainian Academy of Sciences since 1988.

Dr. Ermoliev has been Head of the Department of Mathematical Methods of Operations Research at the Institute of Cybernetics of the Ukrainian Academy of Sciences, Kiev, since 1969. He was first employed with IIASA in the System and Decision Sciences Program from 1979 to 1984, undertaking research in non-differentiable and stochastic optimization problems. During the course of his collaboration with Roger Wets, he was a visiting professor with the University of California at Davis, in 1991.

Dr. Ermoliev's scientific interests are modeling of decision-making processes in the presence of risks and uncertainties, stochastic and dynamic systems optimization, optimization on networks, and nonlinear dynamics. His major publications include Stochastic Programming Methods (1976), Stochastic Models in Economics (1979), and Numerical Techniques for Stochastic Optimization (1988). Other publications concern the study of path-dependent adaptation processes, pollution control problems, energy and agriculture modeling, reliability theory, and optimization of discontinuous systems, in particular, discrete event systems optimization.

Yuri Ermoliev and his students have been the major proponents of a method known as Stochastic Quasi-Gradient (SQG) methods. The basic feature of SQG methods is that they do not demand exact values of objective and constraints functions, which opens up ample opportunities for use in stochastic optimization problems. In particular, general linear, non-linear and dynamic two-stage problems (with N. Shor 1968, Yu. Ermoliev 1976), adaptive Monte Carlo simulations (with T. Maryanovich 1973), limiting and non-stationary problem (with E. Nurminskii and with A. Gaivoronskii), stochastic economic models (with A. Yastremski 1979), stochastic minimax problem (with Nurminskii) were investigated by Yuri Ermoliev. These methods can be viewed as a non-linear path dependent adaptive random search process, and allows us to model rather general growth processes with increasing returns (with A. Brian and Yu. Kaniovskii). Together with his daughter T.Y. Ermolieva, Yuri Ermoliev, and Vladimir Norikin were awarded the Kjell Gunnarson award from Sweden for their work on catastrophic risk management.

Selected Contributions

- Ermoliev Y.M. and Gulenko V.P. On numerical methods for solving optimal control problems, Kibernetika (translated into English as Cybernetics), 1966, No 1, 120-121.
- Ermoliev Y.M. Methods of solving nonlinear extremal problems, Kibernetika (translated into English as Cybernetics), 1966, No 4, 1-17.
- Ermoliev Y.M. and Shor N.Z. Random search method for a two-stage stochastic programming problem, Kibernetika (translated into English as Cybernetics), 1968, No 1, 85-88.
- Ermoliev Y.M. On stochastic generalized gradient method and stochastic quasi-feyer sequences, Kibernetika (translated into English as Cybernetics), 1969, No 2, 73-83.
- Ermoliev Y.M. Methods of stochastic programming, Moscow, Nauka, 1976 (In Russian).
- Ermoliev Y.M. and Yastremski A.I. Stochastic models and methods in economic planning, Moscow, Nauka, 1979 (In Russian).
- Ermoliev Y.M. Stochastic Quasigradient Methods in MINIMAX Problems; Two-Stage Stochastic Programming: Quasigradient Method; Stochastic Quasigradient Methods: Applications; Stochastic Quasigradient Methods: General Theory. In: C.A. Floudas and P.M. Pardalos (eds), Encyclopedia of Optimization, Kluwer Academic Publishers, Dordrecht, Netherlands 2001.



The International Institute for Applied Systems Analysis (IIASA), Austria has played a major role in the development of stochastic programming. Former project leaders included Roger Wets and Andrzej Ruszczyński. Yuri Ermoliev holds down the SP "fort" at this castle.