To 80-th Birth Anniversary
of Academician of NAS of Ukraine
Boris Nikolaevich Pshenichnyi

April this year marks the 80-th birth anniversary of prominent Ukrainian scientist, specialist in the field of applied mathematics and cybernetics, Academician of NAS of Ukraine Boris Nikolaevich Pshenichnyi.

B.N. Pshenichnyi graduated from mechanical and mathematical faculty of Ivan Franko Lvov University, for most part of his life he worked as the head of department at V.M. Glushkov Institute of Cybernetics and for his last years he worked in educational-scientific complex "Institute of applied systems analysis of NTUU "KPI" MON and NAS of Ukraine.

It is worth noting that Kiev school of extreme problems is known worldwide for more than half a century, and one of its most powerful directions is connected with scientific activity of B.N. Pshenichnyi. Great are his contributions to the domestic science: they manifested in development of fundamental methods, proof of subtle mathematical results, creating the scientific school, organization of some investigation structures, training scientific personnel.

The circle of scientist's scientific interests is unusually wide. It includes problems of designing networks and graph theory, numerical optimization methods and mathematical theory of optimal control, convex analysis and necessary extremum conditions, theory of multivalued mappings and differential inclusions, methods of differential games and problems of seeking moving objects, models of economic dynamics, methods for constructing invariant sets of dynamic systems, minimax estimation of parameters, solution of variational inequalities, methods of laying geometric figures.

Boris Nikolaevich was not only productive in many fields of applied mathematics he was also keen on solving urgent practical problems occurred in national economy and in other spheres of life. Being a brilliant analyst he still was engaged in that challenging part that was close to a pure mathematics.

In the environment of specialists-optimizers B.N. Pshenichnyi was known first of all for his pioneering works on general necessary extremum conditions. Using the apparatus of support and quasidifferentiable functionals, subdifferential calculus, technique of cones of tangential directions he obtained the necessary extremum conditions for nonsmooth and nonconvex functions. In this case Boris Nikolaevich introduced the concept of upper convex approximation that afterwards proved to be the efficient means for research. Dealing with applications of multivalued mappings B.N. Pshenichnyi used the concept of locally conjugate mapping, obtained duality ratio for convex multivalued mappings, proved the minimax theorems.

In the field of numerical optimization methods the worldwide recognition was given to his linearization method employed for solving problems of linear and nonlinear programming, solving systems of equalities and inequalities and some other problems. In this range of problems there is another direction which represents developed by B.N. Pshenichnyi gradient methods and methods close to Newton method which demonstrate a high convergence rate. These methods provide high opportunities and are efficient in practical calculations.

One of the most prominent pages in B.N. Pshenichnyi's scientific work is his investigation in the field of theory of differential games. After publication of the known monograph of R. Isaacs there was a great boom in this scientific direction. In this process the scientific schools of L.S. Pontryagin, N.N. Krasovsky, B.N. Pshenichnyi were especially active and successful world centers. Due to high intensity of creative rivalry Boris Nikolaevich obtained some fundamental results. So in the field of positional approach methods there were established sufficient conditions of the game end over the time of the first absorption and in the maximin time. In the development of method of Pontryagin alternating integral for nonlinear systems B.N. Pshenichnyi introduced ε-strategies and also developed the method of semigroup T_ε-operators. For solving global Pontryagin–Mishchenko evasion problem there were proposed the methods of deviation in direction of invariant subspaces and also developed the nonlinear analog of bypass maneuver method. In the group pursuit problem B.N. Pshenichnyi formalized an environment situation that afterwards led to substantiation of classical parallel approach, and in the problem of seeking moving objects he proposed an elegant Markov cellular model optimizing the search process. B.N. Pshenichnyi's methods of minimax estimations and techniques for constructing invariant sets for nonlinear systems are widely known.

Boris Nikolaevich gained great international authority, was the member of Editorial boards of some foreign scientific journals, the lecture on many International Conferences.

Summing up B.N. Pshenichnyi's scientific achievements we note that he wrote about 200 scientific works, some brilliant monographs, brought up 10 doctors and more than 50 candidates of science. For his titanic work he was awarded with State premiums of USSR and Ukraine. Due to his outstanding talent he was always in the center of events and his inborn sincerity, benevolence and high intellect brought him a lot of friends and colleagues.

Ideas of B.N. Pshenichnyi starting in different directions of applied mathematics are urgent and being developed nowadays in works of his pupils and disciples, including foreign publications. Boris

Nikolaevich had a great intuition, his research feature revealed itself in clear and natural ideas that in combination with great analytical skills brought him a worldwide fame.

More detailed information about this scientist and his work results are in review articles.

1. Sergienko I.V., Chikrii A.A., On a scientific heritage of B.N. Pshenichnyi, *Kibernetika i sistemnyi analiz*, 2002, No. 2, 3–31.
2. Sergienko I.V., Chikrii A.A., On development of scientific ideas of B.N. Pshenichnyi in the field of optimization and mathematical control theory, *Kibernetika i sistemnyi analiz*, 2012, No. 2, 3–28.

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