

Head of the Laboratory,

Doctor of physical and mathematical sciences,

Professor Amangeldi Zhusupbaev

This unit operates since 1966 and at first was called the Laboratory for Automation of Accounting, Planning and Management, the founder of which was Doctor of economic sciences, Professor Yu.P. Chernov. From 1979 to 1991 the laboratory was headed by candidate of physical- mathematical sciences E.G.Lange. From 1992 to the present the laboratory is headed by Doctor of physical- mathematical sciences, Professor A. Zhusupbaev.

12 candidates of sciences (Stepanenko I.D., Lange E.G., Zhusupbaev A., Bayalinov E., Batyrkanov M., Skakov S., Andriyash V., Asankulova M., Zhusupbaeva G., Sharshenbieva F., Sultankul Kyzy A., Suynaliev NK), 1 Doctor of economics (Chernov Yu.P.) and 2 Doctors of physical and mathematical sciences (Zhusupbaev A., Asankulova M.) are prepared from among the staff and graduate students in the laboratory.

Research is conducted in the following areas: Development of mathematical models of economic problems and their approbation on specific problems; Development of methods and algorithms for solving multi-extremal problems of mathematical programming.

The class of fractional programming problems is investigated. The essence of these tasks is to find the smallest (largest) value of the ratio of two functions on a convex set. With the help of the introduced one-parametrical function, the problems of fractional-convex and fractional-concave programming were singled out, for which the known properties of convex and concave programming were generalized. This made it possible to generalize the known methods to solve problems of convex and concave programming for solving problems of fractional-convex and fractional-concave programming.

A method to solve was developed using the dynamic programming method for a class of production placement problems, when functions defining production costs are arbitrary continuous.

Methods and algorithms to solve multi-extremal single and multi-product placement problems with a discontinuous objective function are developed.

A sufficient condition for the applicability of the method of successive calculations for a class of special type placement problems is found, and algorithms to apply it their solution are proposed.

A scientific school in economics and mathematics was created. Currently this school is widely known in the CIS countries. The laboratory staff proposed new, relevant to the current time, mathematical models for optimizing the production of enterprises in various sectors of the economy (agriculture and utilities, mining and energy).

The theoretical results of the scientists of this laboratory are a major contribution to the theory of research of operations in economics, and in practical terms, their results, as new mathematical tools, can be used in various sectors of the economy.

According to the results of the research, more than 350 scientific papers including 6 monographs were published in various publications of the near and far abroad.

Laboratory staff give lectures and lead theses of graduates of the KNAU named after K. Skriabin, KNU named after J. Balasagyn, KSU named after I. Arabaev (A. Zhusupbaev), participate in the state certification commission in universities of the republic and hold candidate exams on information technologies (A. Zhusupbaev), participate in the implementation of the State language development program by writing textbooks on economical-mathematical area. 5 textbooks and 2 toolkits for universities of the republic were published.

The laboratory has a wide network of interconnections with scientific divisions of the republic and beyond its borders (CC RAS, MI named after Sololev SB RAS, CEMI RAS, ICM and MG SB RAS, KazNU named after Al-Farabi, KNAU named after K. Skriabin, KNU named after Zh. Balasagyn, Osh NU, JANU).

Since 2004, the employees of the laboratory being in close cooperation with the Institute of Computational Mathematics and Mathematical Geophysics of the Siberian Branch of the Russian Academy of Sciences, the Institute of Energy and Automation of the Academy of Sciences of Uzbekistan, the Tashkent University of Information Technologies of the Republic of Uzbekistan, the Institute of Information and Computing Technologies of the MNS of Kazakhstan, the Novosibirsk State Technical University, have been actively participated in the annual International Asian School Workshop "Problems of optimization of complex systems."