Head of laboratory, Doctor of physical-mathematical sciences, Professor Baizakov Asan Baizakovich

The Laboratory of Applied Mathematics and Informatics was created on the basis of two laboratories: the Laboratory of Applied Informatics (its initial name was Laboratory of Mathematical Methods for Processing Space Information), founded in 1981, and the Laboratory of Applied Mathematics and Programming (its original name was Laboratory of Programming and Algorithmization of Experiments) founded in 1980.

In the Laboratory of Applied Mathematics and Programming (its initial name was Laboratory of Programming and Algorithmization of Experiments), studies were conducted to develop a mathematical model of the objects of research, carrying out algorithmization and programming of experimental data.

In particular, the calculation of the level of confined waters using a non-linear stochastic model of water balance was carried out, the method of determining the parameters of autoregression equations, the method of determining percentage points and quantiles were justified.

Dynamic stochastic models of the constituent elements of the water balance of the Issyk-Kul Lake, intra-annual fluctuations in the level of precipitation in the coastal area of the lake were identified; a small parameter method with a rigorous justification was applied to identify special cases in the hinge mechanisms; problems related to the analytic and qualitative theory of integral and integro-differential equations were also investigated; software development was carried out to ensure corporate electronic document management.

According to the research results, several dozens of scientific papers were published in various publications and implementation certificates were received from various organizations: from the Department of Hydrometeorology and Environmental Control of the Kyrgyz Republic for the development of methods for predicting underground flow in the rivers of Northern Kyrgyzstan; from the Research Institute of Obstetrics and Pediatrics - for the creation of a set of applied programs for predicting the health status of young children in rural areas of the Kyrgyz Republic; from the "Biosphere Territory of Issyk-Kul" - for using the results of scientific research to develop theoretical ideas about the regime level of Lake Issyk-Kul.

The staff of the laboratory of applied mathematics and programming took an active part in the promotion of mathematical knowledge in the Republican school Olympiad on mathematics.

They prepared more than 50 articles for the short encyclopedia "Mathematics" (1991, in Kyrgyz language), 5 textbooks and teaching aids with the stamp of the Ministry of Education and Science of the Kyrgyz Republic were published; they also participated in the development of the textbook for schoolchildren of the republic "Algebra - 8" (2010, in Kyrgyz language).

Currently, the laboratory of applied mathematics and computer science is conducting research on the development of mathematical methods and software for analyzing some properties of square matrices that retain symmetry.

In particular, the principle of conservation of symmetry in block matrices, which gives a construction method, such as symmetric matrices of higher order.

By the decomposition method, an M matrix of about 100*100 was constructed and its topological properties were studied.

Also, a fact was discovered about the possible diversity of the constants of squares in subblocks with matrix decomposition.

It uses some properties of the arithmetic progression.

The problem of solvability of the Cauchy problem for systems of nonlinear first-order nonlinear partial integro-differential equations with a parameter is investigated by a method of transforming solutions and an integral representation of the solutions obtained is found.

Further, for the new class of nonlinear third-order partial differential integro-differential equations

systems, sufficient conditions for the existence of solutions to the Cauchy problem have been found, and in addition, an integral representation of such solutions has been constructed.

Because of the nonlinearity of the initial tasks was found sufficient conditions, generally speaking, does not guarantee the uniqueness of the obtained solutions.

The laboratory prepared and protected 2 doctoral dissertations (Baizakov A.B., 2011, Alymbaev A.T., 2018); 5 candidate dissertations (Nurmatov A.M., Abdimanapov U., Aitbaev K.A. - 2016, Akerova D.A. - 2016, Alieva A.R. - 2018). 2 employees submitted candidate dissertations (Kydyraliev T.R., Dzheenbaeva G.A.), 1 candidate dissertation (M. Sharshenbekov) are at the design stage.

The staff of the laboratory published 2 monographs, prepared 1 monograph for publication, published a textbook "The Qualitative Theory of Differential Equations" (2013), the textbook "Дифференциалдык тендемелер (Лекциялар жана практикалык иштер курсу)" (2016); received 2 certificates of Kyrgyzpatent.