

Editorial Policy of the Journal

“Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series”

1. General Provisions

1.1. «The Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series» (hereinafter referred to as the Journal) is a peer-reviewed research, methodological, and scholarly organizational journal specializing in the publication of original, high-quality works in all areas of theoretical and applied research, scientific and methodological studies, as well as scholarly organizational issues in the fields of Mathematics, Computer Science, and Mechanics, including descriptive sections reflecting contemporary scientific developments.

1.2. The Journal has been published since 1995. It is registered with the Ministry of Information and Communications of the Republic of Kazakhstan. Certificate of re-registration No. KZ65VPY00031936 dated February 2, 2021.

1.3. The Journal has been assigned the following identifiers by the International Centre for the Registration of Serial Publications: ISSN (Print) 3007-0155, ISSN (Online) 3007-0163.

1.4. The Journal is published once every three months, four times a year.

1.5. The languages of publication are Kazakh, English, and Russian.

1.6. Open access policy. The Journal provides immediate open access to its content based on the following principle: free open access to research results contributes to the increase of universal knowledge. The official website of the Journal <https://bulmathmc.enu.kz/> provides all interested readers and authors with the necessary information about the scientific journal and the conditions for publishing articles (link to the archive of issues: <https://bulmathmc.enu.kz/index.php/main/issue/archive>).

1.7. Archiving. Electronic versions of the scientific journal are provided to “National Center of Science and Technology Evaluation” for the formation of collections and inclusion in the electronic library. The Journal also archives its materials in Elibrary.ru.

1.8. The founder and publisher is the Non-Profit Joint-Stock Company “L.N.Gumilyov Eurasian National University”. Address: Kazakhstan, 010008, Astana, Satpayev Street, 2, ENU, Academic and Administrative Building No. 1.

1.9. Amendments and additions to the editorial policy of the Journal are made by decision of the Editorial Board.

2. Goals, scope, and continuous development of the Journal

At the outset, we note that everything stated below is based on the authors’ experience in scientific, methodological, and organizational research and development, where each assertion is formed through insight and reflection on specific examples of the authors’ own activities, leading to the conclusion that “it is hardly possible to conceive all this purely theoretically.”

The goal of the Editorial Board of the Journal is:

The publication of carefully selected original high-quality scientific research, scientific-methodological, and scientific-organizational works in all areas of theoretical and applied research in the fields of Mathematics, Computer Science, and Mechanics.

An article accepted for publication, through the best efforts of the Editorial Board and reviewers, should be free from scientific errors and from a lack of results or meaningful contribution.

Objectives of the Journal:

- publication of articles with mandatory scientific novelty as something new, previously unknown, and substantive in the context of existing knowledge, on promising topics and research directions, with the aim of making an unconditional contribution to international science and involving students of all levels, faculty members, and staff of the Science and Education System of Kazakhstan in these studies;
- publication of scientific research, scientific-methodological, and scientific-organizational articles on the systemic organization of Kazakhstan in the mass training of highly qualified specialists, both domestic and foreign, in Mathematics, Computer Science, and Mechanics;
- publication of “key articles of the Journal issue” of direct thematic focus, with the involvement of leading national and international specialists of international standing as authors; the articles themselves should be in a state of readiness for immediate application in the development of Mathematics, Computer Science, and Mechanics in the international scientific space and in the Republic of Kazakhstan;
- provision of the Journal’s scientific platform to national and international authors for consolidating new ideas in the international arena through detailed presentation and for their discussion;
- the Journal publishes scientific-organizational proposals aimed at stimulating large-scale scientific activities (scientific conferences, grant funding with relevant competitive documentation and peer review, textbooks and curricula for school mathematics courses, scientific and educational programs for master’s and PhD doctoral studies, awarding of academic degrees and titles, evaluation and requirements for experts of various appointments, etc.);
- the Journal welcomes publications of scientific-methodological materials of direct practical application on current topics in school and university mathematics;
- improvement of the quality of scientific articles through systematic work of the Journal’s Editorial Board with authors and reviewers in accordance with the Journal’s established requirements for the structure of articles and reviews;
- proactive integration of Kazakhstan into the global scientific community through original national scientific breakthroughs in Mathematics, Computer Science, and Mechanics, with the development of regulations for collaboration with leading specialists from top universities based on the development and generalization of productive experience gained at each stage.

Needs of the Journal for further development:

The Journal is published in Kazakhstan, in the capital city of Astana, at the Non-Profit Joint-Stock Company “L.N. Gumilyov Eurasian National University”. The Journal primarily pursues the goal of developing Mathematics, Computer Science, and Mechanics at the international level in the Republic of Kazakhstan. Kazakhstan occupies a vast territory of 2.7 million square kilometers and is divided into 19 regions, each of which has regional universities; materials of the Journal are disseminated to support their development.

In Kazakhstan, strict state-level regulations based on scientometrics have been adopted; therefore, the research-activating and scientific-methodological publications of the Journal are not administratively supported. For this reason alone, in 2024 the Editorial Board of the Journal appealed to Web of Science with a request, first, to accelerate the decision-making process and, second, to assign the highest Web of Science category, Q1. In justification of this perhaps non-standard request, we emphasize that in less than eight years of its existence the Journal has published solutions to four problems of international significance and introduced and developed, as authorial know-how, the project “Key Article of the Journal Issue”.

As can be seen from the published articles of the Journal, the authors of the solved problems of international significance and the “Key Articles of the Journal Issue” are currently exclusively staff members of the Research Institute at the L.N.Gumilyov Eurasian National University, namely the Institute of Theoretical Mathematics and Scientific Computations (IThM&SC); therefore, granting the Journal’s request would constitute significant administrative support for the stated goal of developing Mathematics, Computer Science, and Mechanics in Kazakhstan with a transition into international science in the “Key Article of the Journal Issue” format, involving specialists from other scientific institutions. With a call for cooperation to many such institutions, both domestic and foreign, the Editorial Board of the Journal makes systematic appeals. In addition, the presence of high scientometric indicators of the Journal would attract researchers in the international scientific community to submit “Key Articles of the Journal Issue”, since everyone with their own breakthroughs understands the difficulties that accompany the publication of fundamentally new results.

In conclusion, we note that the “Key Article of the Journal Issue”, without such a section from the very beginning of the journal’s establishment under the title “Bulletin of the Eurasian University”, and later “Bulletin of the L.N. Gumilyov Eurasian National University” without division into series, carried out publications as follows:

Temirgaliev N. Teoretiko-chislovyye metody i teoretiko-veroyatnostnyy podkhod k zadacham analiza. Teoriya vlozhenii i priblizhenii, absolyutnaya skhodimost’ i preobrazovaniya ryadov Fur’e [Number-theoretic methods and a probabilistic approach to problems of analysis. Embedding and approximation theory, absolute convergence and transformations of Fourier series], Vestnik Evraziiskogo universiteta [Bulletin of the Eurasian University]. 1997. No. 3. P. 90-144.

Temirgaliev N. Komp’yuternyy (vychislitel’nyy) poperechnik. Algebraicheskaya teoriya chisel i garmonicheskii analiz v zadachakh vosstanovleniya (metod Kvazi-

Monte Karlo). Teoriya vlozhenii i priblizhenii. Ryady Fur'e [Computer (computational) width. Algebraic number theory and harmonic analysis in reconstruction problems (the quasi-Monte Carlo method). Embedding and approximation theory. Fourier series], Vestnik Evraziiskogo natsional'nogo universiteta im. L. N. Gumileva. Spets. vypusk, posvyashchennyi nauchnym dostizheniyam matematikov ENU im. L. N. Gumileva [Bulletin of the L.N. Gumilyov Eurasian National University. Special issue dedicated to the scientific achievements of mathematicians of the L.N. Gumilyov Eurasian National University]. 2010. P. 1-194.

3. Science as a body of reliable exploratory knowledge.

The multidisciplinary journal "Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series" publishes original research papers containing new scientific results in Mathematics, Computer Science, and Mechanics, without any restrictions on research areas and sections, provided that all requirements of the Journal are met. Primary attention is given to results that are of a definitive nature, both within a specific specialization and of fundamental significance.

The journal "Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series" also publishes articles at the interface of Mathematics and Computer Science, including general reconstruction problems, among them those describing various mathematical models. At the same time, the Journal adheres to positions concerning the smoothness of the objects under consideration, ranging from finitely differentiable and analytic to completely non-smooth objects, but with the construction of new mathematical structures endowed with certain analogues of developed topologies. Mechanics is considered under the same criteria.

3.1. Standard sections of the Journal. *The Journal accepts for consideration, without restrictions, articles in all major areas of theoretical and applied research,* which include mathematical analysis, function theory, functional analysis, algebra, geometry, topology, differential equations, partial differential equations, probability theory, stochastic processes, mathematical statistics, optimal control, number theory, mathematical logic, theory of algorithms, discrete mathematics, computational mathematics, the probabilistic approach to problems of analysis; computer graphics and visualization, computer security, computer vision and pattern recognition, digital education, software, theoretical computer science, databases and data mining, the gaming industry and software engineering, natural language processing, artificial intelligence, machine learning, soft computing—fuzzy systems, signal processing, and others; theoretical mechanics, applied mechanics and motion control, hydrodynamics, aeromechanics, gas and wave dynamics, elasticity theory, plasticity theory, and mechanics of composites.

The topics of articles published in the Journal cover a wide range of problems using research methods from various areas of mathematics, including algebraic number theory, probability theory, general measure theory, complexity theory, mathematical analysis, functional analysis, complex analysis, approximation theory, computational mathematics, the theory of trigonometric and orthogonal series,

embedding theory, and others. Let us list some topics and directions of the published articles: multidimensional and infinite-dimensional problems, inverse and ill-posed problems, machine learning, the Monte Carlo and quasi-Monte Carlo methods, multidimensional numerical integration and differentiation, noisy data, numerical analysis, optimization, scientific computing, solvability of multidimensional problems, approximation theory, compressed computing, discrete problems, differential equations, artificial intelligence, computer science, pattern recognition, distributed computing, mechanics of mechanisms, and continuum mechanics. This also includes articles proposing new computational aggregates that arise in solving various optimization problems with service support in the form of admissible limits of computational errors of information functionals, preserving the orders of reconstruction errors with respect to exact information.

3.2. “Key Article of the Journal Issue” is devoted to a specific topic or direction based on new problem formulations with new solution methods, with the possibility of stimulating further new research, without any restrictions on volume and format of presentation. This represents one of the forms of implementing scientific support through “providing the Journal’s scientific platform for consolidating new ideas in the international space through detailed presentation and their discussion”. The Journal has published 21 such articles with a total volume of 650 pages, the most recent of which is “Inverse K(B)P as a direct formula-based solution (without neural networks) of an AI/ML problem for any smooth mathematical model, with the idea of further continuation through the creation of new mathematical structures for non-smooth problems with their own ‘topologies’.”

Within the framework of the Journal’s long-term plans, other topics and directions not yet covered in the section “Key Article of the Journal Issue” are awaiting their turn:

Direction 1. Computational (numerical) diameter (C(N)D) as a synthesis of the known and the new in Approximation Theory, Computational Mathematics, and Numerical Analysis, which, according to K. Fletcher, “includes as its constituent parts the formulation of the problem, mathematical analysis, the construction of an algorithm, and the refinement of a computer program so that it produces results.”

Topic 2. Classes (and spaces) of functions, which, in the words of A.N.Kolmogorov, solves the problem of “there are many of us,” that is, providing publication opportunities for “many.”

Direction 3. Mathematical tools of direct application: algebraic number theory combined with harmonic analysis in problems of numerical integration and the theory of random numbers.

Direction 4. Mathematical tools of direct application: tensor products of functionals combined with harmonic analysis in problems of numerical analysis, function reconstruction, and discretization of solutions of partial differential equations based on the values of initial and boundary conditions at points.

Direction 5. Irregular distributions and the quasi-Monte Carlo method as, according to K. Roth, promising research directions in mathematics and computer science of the 21st century with extensive applications.

Topic 6. Function reconstruction in the context of $C(N)D$.

Topic 7. Numerical differentiation of functions in the context of $C(N)D$.

Topic 8. Discretization of solutions of partial differential equations in the context of $C(N)D$.

Direction 9. Probabilistic approach to problems of Analysis: construction of probability measures on classes of functions.

Topic 10. Probabilistic approach to problems of Analysis: errors of numerical integration methods “on average” with respect to probability measures on classes of functions.

Topic 11. Probabilistic approach to problems of analysis: errors of function reconstruction methods and discretization of solutions of partial differential equations “on average” with respect to probability measures on classes of functions.

Direction 12. Embedding and approximation theory: solved and unsolved problems.

Topic 13. Fourier series: transformations of coefficients and summation.

Direction 14. Kolmogorov prewidth.

Topic 15. Morrey theory not as “trivial generalizations by replacing the Lebesgue norm with the Morrey norm”.

Direction 16. Discrete and fast “algebraic” Fourier transforms.

Direction 17. Random number generators in the context of new formulas of discrete “algebraic” Fourier transforms. Generation of Lehmer random numbers with maximal period according to the Covey–MacPherson requirements and their extensive applications.

Direction 18. “Geometry of numbers” in the context of algebraic number theory.

Direction 19. The Galerkin method and new theoretical developments with subsequent applications in the context of its inherent vulnerability.

Direction 20. $C(N)D$: analysis of infinitely smooth functions.

Direction 21. The Radon transform in the context of the equivalence of Computer Tomography and Computer (computational) width.

Topic 22. Oscillation theory and its applications in the context of the method of tensor products of functionals.

Direction 23. Reconstruction of continuous functions by polynomials with respect to an orthonormal system, with coefficients being values of the approximated function at points and with error expressed via Fourier coefficients with respect to the orthonormal system.

Direction 24. Inverse $C(N)D$ as a direct formula-based solution (without neural networks) of an AI/ML problem for any smooth mathematical model, with the idea of further continuation through the creation of new mathematical structures for non-smooth problems with their own “topologies”.

3.3. The Journal has published authorial solutions to four problems in Mathematics and Computer Science. The journal “Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series” publishes specialized studies in each of its scientific sections, distinguished by

fundamental and innovative discoveries that expand the understanding of deep ideas in Mathematics, Computer Science, Artificial Intelligence (AI), and Machine Learning (ML). Their numerous applications confirm the principle that there is nothing more practical than a good theory.

The types of fundamental scientific novelty presented in the Journal, with a brief exposition at the level of “two courses of study at a faculty of the physical and mathematical sciences,” are as follows.

The first type is a clearly formulated nodal problem, the solution of which presupposes an equally clear formulation.

The second type is a clearly formulated theoretical problem with a history of more than a century, having universal practical applications, but without any characteristics of possible final solutions.

The third type consists of new integrative research schemes for developed topics and directions, supplemented by continuations, in the context (at a considerable distance in the direction “from below”) of the position of A. N. Kolmogorov: “I am reproached for being a mathematician without theorems, who never proves anything, who is much more capable of posing problems than solving them; but I believe that this may well be true, and that this is rather not a shortcoming but a merit.”

The fourth type is the development of ideas from mathematically rigorously developed models to intuitively and practically clear problems, with the creation of new mathematical structures based on a critical analysis of the corresponding technologies.

1⁰.The Lehmer linear congruential sequence in the randomness of Covey and MacPherson.

The Lehmer linear congruential sequence was introduced in 1948 from the equation of a straight line $y = ax + c$ in the form of a permutation of the sequence $1, 2, \dots, N$ according to the recurrence formula

$$x_{n+1} = ax_n + c \pmod{N} \quad (n \geq 0).$$

The randomness proposed by Covey and MacPherson in 1965 consists in finding a and c depending on N in such a way that, in the expansion into a finite trigonometric Fourier sum of a fixed number of consecutive elements of this sequence, the coordinate of the nonzero Fourier coefficient closest to zero is as far as possible from that same zero—hence the name “spectral criterion”.

And in this, perhaps, lies the entire value of this problem: in mathematics there are many examples where a formulation based on the most elementary foundations is itself fundamental.

There is Stanford, the capital of Silicon Valley, and there is Donald Knuth.

Donald Knuth (Lex Fridman, science journalist, 2025): *Donald Knuth is one of the greatest and most influential scientists in the history of Computer Science and Mathematics. He is the recipient of the 1974 Turing Award, often referred to as the Nobel Prize of computing. He is the author of the multi-volume work The Art of Computer Programming, his magnum opus.*

He made several key contributions to the rigorous analysis of the computational complexity of algorithms, including the popularization of asymptotic notation, which we all fondly know as Big O notation. He also created the TeX typesetting system, which is used by most computer scientists, physicists, mathematicians, and, more broadly, scientists and engineers to write scientific papers and give them a beautiful appearance.

The role of D. E. Knuth's monograph *The Art of Computer Programming* in the world of Computer Science is elevated to the level of all humankind:

The journal American Scientist included The Art of Computer Programming in the list of the 12 greatest physical and mathematical monographs of the twentieth century, alongside the works of Dirac on quantum mechanics, Einstein on the theory of relativity, and a small number of others.

The cover of the third edition of the first volume of the book contains a quotation by Bill Gates: *"If you think you're a really good programmer..., read The Art of Computer Programming (by Knuth)... If you can read the whole thing, you should definitely send me your résumé."*

Let us turn to the monograph itself:

3.3.4. Спектральный критерий

В этом разделе рассматривается особенно важный метод проверки качества линейных конгруэнтных генераторов случайных чисел. Все хорошие генераторы проходят проверку спектральным критерием; все генераторы, известные сейчас как плохие, фактически провалились при этой проверке. Таким образом, спектральный критерий является наиболее мощным известным до сих пор критерием и заслуживает особого внимания.

In each of the three editions of his monograph, Donald Knuth described the state of the subject at the time of its preparation; in the latest known presentation, together with the accompanying material, it amounts to approximately 50 pages of text.

About a quarter of these pages are devoted to problems that, over the course of 50 years, have not found a complete and final solution in thousands and tens of thousands of publications with the highest scientometric indicators. And herein lies the power, beauty, and mystery of Mathematics: for 10 lines of problem formulation, there are 10 lines of a complete solution, followed by a practical recommendation expressed in just one line.

Temirgaliev N. Elementarnoe postroenie lineinoi kongruentnoi posledovatel'nosti Lekhmera s toi stepen'yu sluchainosti, s kakoi trebovaniyam sluchainosti otvechaet spektral'nyi test Koveiu i Makfersona [Elementary construction of the linear congruent Lehmer sequence with the degree of randomness that is required by the spectral test of Coveyou and MacPherson], Vestnik Evraziiskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series]. 2018. Vol. 123. No. 2. Pp. 8–55.

Temirgaliyev N. Full spectral testing of linear congruent method with a maximum period // arXiv:1607.00950 [math.NA]

The Lehmer random number generator, or the linear congruential sequence of maximal period introduced in 1948, is, by definition, a recurrent sequence $\langle x_n \rangle$ of nonnegative integers

$$X_{n+1} = (aX_n + c) \bmod N, n \geq 0$$

where integer numbers $a > 1, N > a, c > 0$ such that c and N mutually prime, $a - 1$ divisible by each prime divisor N and divisible by 4, if N divisible by 4. Also, for s -dimensional ($s \geq 2$) sequence $y_1 = (x_1, \dots, x_s), y_2 = (x_2, \dots, x_{s+1}), \dots, y_{N-s+1} = (x_{N-s+1}, \dots, x_N)$ let define

$$v_s(a, N) = \inf \left\{ \sqrt{m_1^2 + \dots + m_s^2} : m = (m_1, \dots, m_s) \in Z^s, m \neq 0, \sum_{j=1}^s m_j a^{j-1} \equiv 0 \pmod{N} \right\}.$$

Then the problem consists, for given $s \geq 2, \tau \geq 2, \lambda \geq 1$ in choosing pairs N and a such that $(a - 1)^\tau \equiv 0 \pmod{N}, (a - 1)^{\tau-1} \not\equiv 0 \pmod{N}, \lambda N = (a - 1)^\tau$ and so that the quantity $v_s(a, N)$ is as large as possible, given a known upper bound of $v_s(a, N) \leq \gamma(s)N^{\frac{1}{s}}$.

A complete solution to the “SC-spectral criterion” problem for the “magic” numbers a and N is as follows:

$$1^0. \text{SC-2: } v_2^2(a, N; (a - 1)^2 = N) = (a - 1)^2 \left(1 - 2 \frac{a-2}{(a-1)^2} \right) = N \left(1 - 2 \frac{\sqrt{N}-1}{N} \right),$$

$$2^0. \text{SC}(2 \leq s = \tau): N^{\frac{2}{s}} \left(1 - (b_s - 1)N^{-\frac{1}{s}} \right)^2 = (a - b_s)^2 \leq v_s^2(a, N; (a - 1)^s = N) \leq a^2 + 1 = N^{\frac{2}{s}} \left(1 + 2N^{-\frac{1}{s}} + 2N^{-\frac{2}{s}} \right).$$

$$3^0. \text{SC}(2 \leq s < \tau, \lambda \geq 1): (N\lambda)^{\frac{2}{\tau}} \left(1 - (b_s - 1)(N\lambda)^{-\frac{1}{\tau}} \right)^2 = (a - b_\tau)^2 \leq v_s^2(a, N; (a - 1)^\tau = N\lambda, 1 \leq \lambda \leq (a - 1)^{\tau-s}) \leq a^2 + 1 = (N\lambda)^{\frac{2}{\tau}} \left(1 + 2(N\lambda)^{-\frac{1}{\tau}} + 2(N\lambda)^{-\frac{2}{\tau}} \right),$$

$$4^0. \text{SC}(s > \tau \geq 2, \lambda \geq 1): v_s^2(a, N; (a - 1)^\tau = N\lambda, \lambda \geq 1) \leq \sum_{k=0}^{\tau} \left(\binom{\tau}{k} \right)^2,$$

where $(-b_m)$ is the binomial coefficient with the largest absolute value and negative sign in the expansion of $(a - 1)^m$ in powers of a : $b_2 = 2, b_3 = 3, b_4 = 4, b_5 = 10, b_6 = 20, b_7 = 35, b_8 = 56, b_9 = 126, b_{10} = 252, b_{11} = 462, b_{12} = 792, b_{13} = 1716, b_{14} = 3432, b_{15} = 6435, \dots$ and so on.

We note that in Sections 1⁰-3⁰, a “strengthened” asymptotic estimate of the previously known upper bound is established, and hence it is unimprovable, whereas Section 4⁰ completes the full picture as the case of non-applicability.

Practical choice of a and N :

$$a = 4^{r_0} p_1^{r_1} \cdots p_t^{r_t} + 1, N = 4^{u_0} p_1^{u_1} \cdots p_t^{u_t}, 2 \leq s \leq \tau = \max \left\{ \left\lceil \frac{u_1}{r_1} \right\rceil; \dots; \left\lceil \frac{u_t}{r_t} \right\rceil \right\}.$$

Apparently, it is hardly possible to experimentally identify the “magical” \equiv “enchanted” numbers a and N from all possible Big Data x_0, a, c, N , which provides yet another possible answer to the question: “Can ML-AI completely replace Science?”

2⁰. A widely studied problem with a history of more than a century has been brought to a complete solution in just two lines of formulas for direct application. This is the problem of Computerized Tomography, in which one must determine the density of a body without violating its surface. It has been solved by a new method in a single equivalent relation, without any intermediate steps since Johann Radon in 1917, whose work provided the theoretical foundation for the instruments of A. Cormack and G. Hounsfield, who were awarded the Nobel Prize in Physiology or Medicine in 1979. Using these 2023 formulas explicitly is unnecessary; more precisely, the problem – long considered routine in Approximation Theory as the reconstruction of functions via finite convolution—turns out to be equivalently linked to the most complex problem in Computerized Tomography.

$$\sup_{\|f\|_{W_2^{\alpha(y)}(E_s)} \leq 1} \|f(x) - \sum_{k=1}^N f(\xi_k) \Phi_N(x - \xi_k)\|_{W_2^{\rho(y)}(E_s)} \succ \prec$$

$$\succ \prec \sup_{\|f\|_{W_2^{\alpha(y):\|y\|^{\frac{s-1}{2}}(S^{s-1} \times R^1)} \leq 1} \|f(x) - \sum_{k=1}^N (R^2)^{-1} R f(\xi_k) R(\Phi_N(y - \xi_k))(x)\|_{W_2^{\rho(y):\|y\|^{\frac{s-1}{2}}(S^{s-1} \times R^1)}$$

where $Rf(x) := \int_{y \in R_x^{s-1} \cap \text{supp} f} f(y) dy$, R_x^{s-1} is a hyperplane

perpendicular to the vector ∂x , passing through the point x - this is the Radon transform, and the kernel $\Phi_N(x)$ is a real-valued function that is 1-periodic in each $x = (x_1, \dots, x_s)$ of the s variables.

“The Contribution of Scientific Theories and Discoveries to the Progress of Society as a Whole (University of Vienna, 2016)”.

The Rector of the University of Vienna (referring to J. Radon): “Often it happens that mathematical theories exist in an abstract form, perhaps regarded as sterile tricks, which suddenly turn out to be valuable tools for physical knowledge, thus unexpectedly revealing their hidden power.”

Karl Sigmund: “Johann Radon investigated abstract problems of so-called pure mathematics and had no idea that today the Radon transform would form the basis of computed tomography. Their numerous applications confirm the rule: there is nothing more practical than a good theory.”

3⁰. A New Research Scheme in Approximation Theory, Numerical Analysis, and Computational Mathematics: In the optimal computational aggregate, informational functionals are calculated with errors, where the magnitude of the error must be maximally large so that the order of reconstruction according to the exact values of the functionals is preserved, while simultaneously determining a set of reconstruction operators, among which the studied aggregate will belong to the best.

This entire formulation is called the **Computational (Numerical) Diameter (C(N)D)** and is divided into three sequential tasks:

C(N)D-1. Reconstruction from exact information, depending on the type of functionals and algorithms for processing the numerical information obtained from them, encompasses all known approximation theory, numerical analysis, computational mathematics, and function theory – Fourier series, bases.

C(N)D-2. In the optimal computational aggregate, the values of the informational functionals can be replaced by nearby values while maintaining optimality. The search for the largest such deviations forms an independent problem of finding extremal errors – a new optimization problem.

C(N)D-3. There exists, or does not exist, another computational aggregate with a structure analogous to that of the considered optimal computational aggregate, and perhaps even more general, but with a larger order of extremal error.

The *C(N)D* problem is historically and substantively presented in full detail in the articles

Temirgaliyev N., Zhubanysheva A.Zh. Teoriya priblizheniy, Vychislitel'naya matematika i Chislennyy analiz v novoy kontseptsii v svete Komp'yuternogo (vychislitel'nogo) poperechnika [Approximation Theory, Computational Mathematics and Numerical Analysis in new conception of Computational (Numerical) Diameter], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 124. No 3. P. 8-88.

Temirgaliyev N., Zhubanysheva A.Zh. Computational (Numerical) Diameter in a Context of General Theory of a Recovery, Russian Mathematics. 2019. Vol. 63. No 1. P. 79-85.

The problem of recovery from exact information (*C(N)D-1*) has been known and developed over many decades in numerous publications with various notations. These works include those by A. Sard, S.M. Nikolsky, N.S. Bakhvalov, I. Babushka and S.L. Sobolev, C.A. Mitchell and T. J. Ravlin, J.F. Traub, G. Vasilkovsky, and H. Wozhnyakovsky, A. Pincus, V.N. Temlyakov, N.P.Korneichuk, E. Novak, H. Vozhnyakovsky, J. Vibiral, B. Kashin, E. Kosov, I. Limonova, V. Temlyakov, and many others.

Regarding recovery from inexact information, the publications can be divided into three groups: the first group includes works by N. Temirgaliev and co-authors; the second group – by V.M. Tikhomirov, G.G. Magaril-Ilyaev, K.Y. Osipenko, A.G. Marchuk and co-authors; and the third group – by J. Traub, H. Vozhnyakovsky, L. Plaskota and co-authors. These groups differ not only in their problem statements but also, interestingly, in the terminology used for essentially the same mathematical objects, and consequently in the formulation of results. The problem of recovery from inexact information in the context of the second and third parts (*C(N)D-2* and *C(N)D-3*) represents a new development.

The next lower bound, obtained for all possible computational aggregates constructed from arbitrary linear information $l_1(f), \dots, l_N(f)$ and processed according to the algorithm $\varphi_N(z_1, \dots, z_N; \cdot)$, without any restrictions except for natural ones

$$\begin{aligned}
& \inf_{\substack{l_1, \dots, l_N - \text{всевозможные} \\ \text{линейные функционалы}; \Phi_N}} \sup_{f \in W_p^r(0,1)^s} \left\| f^{(\alpha_1, \dots, \alpha_s)}(\cdot) - \varphi_N(l_1(f), \dots, l_N(f); \cdot) \right\|_{L^q(0,1)^s} \\
& \gg \begin{cases} N^{-\frac{r}{s} + \frac{\alpha_1 + \dots + \alpha_s}{s} + (\frac{1}{p} - \frac{1}{q})}, & \text{если } 2 \leq p \leq q \leq \infty, \\ N^{-\frac{r}{s} + \frac{\alpha_1 + \dots + \alpha_s}{s} + \frac{1}{2} \frac{1}{q}}, & \text{если } 1 \leq p < 2 \leq q \leq +\infty, \\ N^{-\frac{r}{s} + \frac{\alpha_1 + \dots + \alpha_s}{s}}, & \text{если } 1 \leq p \leq q < 2 \end{cases}
\end{aligned}$$

allows the widely developed C(N)D-1 problem, with its separately studied cases, to be unified into a single framework through upper bounds that encompass the known diameters of Kolmogorov, Korneichuk, Tikhomirov, Temlyakov, etc., and approximation problems – Fourier-Lebesgue series over all possible orthonormal systems and their means, various bases and frames. This also covers actively researched topics of recent years, including wavelet systems and greedy algorithms.

The C(N)D formulation in three tasks will be illustrated using the example of Numerical Differentiation in one (out of three possible) case $2 \leq p \leq q \leq \infty$, $r > \alpha_1 + \dots + \alpha_s + s \left(\frac{1}{p} - \frac{1}{q} \right)$, $N = 2^{ns}$ ($n = 1, 2, \dots$), where the function $(\alpha_1, \dots, \alpha_s)$ – derivatives are defined in the sense of Weyl.”

$$\begin{aligned}
\text{C(N)D-1: } \delta_N(0; L_N(W_p^r(0,1)^s) \times \{\varphi_N\}_{L^q(0,1)^s})_{L^q(0,1)^s} & \equiv \\
& \equiv \inf_{\substack{l_1, \dots, l_N - \text{всевозможные} \\ \text{линейные функционалы}; \Phi_N}} \sup_{f \in W_p^r(0,1)^s} \left\| f^{(\alpha_1, \dots, \alpha_s)}(\cdot) - \varphi_N(l_1(f), \dots, l_N(f); \cdot) \right\|_{L^q(0,1)^s} \\
& \gg \ll N^{-\frac{r}{s} + \frac{\alpha_1 + \dots + \alpha_s}{s} + (\frac{1}{p} - \frac{1}{q})},
\end{aligned}$$

Here, the optimal (non-improvable) order of recovery from exact information has been obtained.

C(N)D -2: For $(\alpha_1, \dots, \alpha_s)$ derivative of the partial sum of Fourier-Lebesgue series

$$\bar{\varphi} \left(\{\hat{f}(m)\}_{m \in I_n}; x \right) \equiv S_N^{(\alpha_1, \dots, \alpha_s)}(f; x) = \sum_{\substack{m=(m_1, \dots, m_s) \in Z^s: \\ |m_j| \leq 2^n (j=1, \dots, s)}} \hat{f}(m) \prod_{j=1}^s (e^{2\pi i m_j x_j})^{(\alpha_j)}$$

the value $\tilde{\varepsilon}_N \equiv \tilde{\varepsilon}_N(\Phi_N) \equiv \tilde{\varepsilon}_N(\Phi_N(W_p^r) \times \{\varphi_N\}_{L^q(0,1)^s}) = N^{-\frac{r}{s} - (1 - \frac{1}{p})}$ is the limiting error:

Firstly,

$$\begin{aligned}
& \delta_N(0; L_N(W_p^r(0,1)^s) \times \{\varphi_N\}_{L^q(0,1)^s})_{L^q(0,1)^s} \gg \ll \\
& \gg \ll \delta_N(\tilde{\varepsilon}_N(\Phi_N)) = N^{-\frac{r}{s} - (1 - \frac{1}{p})}; L_N(W_p^r(0,1)^s) \times \{\varphi_N\}_{L^q(0,1)^s})_{L^q(0,1)^s} \equiv
\end{aligned}$$

$$\begin{aligned}
&\equiv \inf_{\substack{l_1, \dots, l_N \text{--all possible} \\ \text{linear functionals}; \varphi_N}} \sup \left\{ \left\| f^{(\alpha_1, \dots, \alpha_s)}(\cdot) - \varphi_N \left(l_1(f) + \gamma_N^{(1)} \tilde{\varepsilon}_N, \dots, l_N(f) + \gamma_N^{(N)} \tilde{\varepsilon}_N; \cdot \right) \right\|_{L^q(0,1)^s} : f \right. \\
&\quad \left. \in W_p^r(0,1)^s, |\gamma_N^{(\tau)}| \leq 1 (\tau = 1, \dots, N) \right\} \gg \\
&\quad \gg \delta_N(\tilde{\varepsilon}_N(\Phi_N) = N^{-\frac{r}{s} - (1 - \frac{1}{p})}; S_N^{(\alpha_1, \dots, \alpha_s)}(f; x))_{L^q(0,1)^s} \equiv \\
&\equiv \sup_{\substack{f \in W_p^r(0,1)^s \\ |\gamma_N^{(\tau)}| \leq 1 (\tau = 1, \dots, N)}} \left\| f^{(\alpha_1, \dots, \alpha_s)}(x) - \sum_{\substack{m = (m_1, \dots, m_s) \in Z^s: \\ |m_j| \leq 2^n (j = 1, \dots, s)}} \left(\hat{f}(m) + \gamma_N^{(m)} \tilde{\varepsilon}_N \right) \prod_{j=1}^s (e^{2\pi i m_j x_j})^{(\alpha_j)} \right\|_{L^p(0,1)^s} \gg \\
&\quad \gg N^{-\frac{r}{s} + \frac{\alpha_1 + \dots + \alpha_s}{s} + (\frac{1}{p} - \frac{1}{q})}.
\end{aligned}$$

secondly, for any increasing to $+\infty$ positive sequence $\{\eta_N\}_{N=1}^{+\infty}$ there is the equality

$$\lim_{N \rightarrow \infty} \frac{\delta_N \left(\eta_N \tilde{\varepsilon}_N; \sum_{\substack{m = (m_1, \dots, m_s) \in Z^s \\ |m_j| \leq 2^n (j = 1, \dots, s)}} \hat{f}(m) \prod_{j=1}^s (e^{2\pi i m_j x_j})^{(\alpha_j)} \right)_{L^q(0,1)^s}}{\delta_N(0; L_N(W_p^r(0,1)^s) \times \{\varphi_N\}_{L^q(0,1)^s})_{L^q(0,1)^s}} = +\infty.$$

Here, the exact order of the maximal error in computing the information functionals has been determined, while preserving the non-improvable orders of recovery from exact information (depending, we emphasize, on the optimal computational aggregate in C(N)D-1, of which there may be more than one).

C(N)D-3: Any computational aggregate $\varphi_N(\hat{f}(m^{(1)}), \dots, \hat{f}(m^{(N)}); x)$ constructed by trigonometric Fourier coefficients with an arbitrary spectrum of N harmonics cannot have a limiting error larger (by order) than the limiting error of $S_N^{(\alpha_1, \dots, \alpha_s)}(f; x)$: for any positive sequence increasing to $+\infty$ the following equality is fulfilled

$$\lim_{N \rightarrow \infty} \frac{\delta_N \left(\eta_N \tilde{\varepsilon}_N; \varphi_N(\hat{f}(m^{(1)}), \dots, \hat{f}(m^{(N)}); x) \right)_{L^q(0,1)^s}}{\delta_N(0; L_N(W_p^r(0,1)^s) \times \{\varphi_N\}_{L^q(0,1)^s})_{L^q(0,1)^s}} = +\infty.$$

Here, the question is addressed whether one can switch to another computational aggregate while achieving order improvements in both recovery speed and maximal error, with the answer being negative.

4⁰. The inverse C(N)D as a direct formula-based solution (without neural networks) of the AI–ML problem for any smooth mathematical model, with the idea of further development through the creation of new mathematical structures for non-smooth problems with their own «topologies».

The approach follows the standpoint of the smoothness of the objects under consideration, ranging from finitely differentiable and analytic objects to those that are not smooth at all, but with the construction of new mathematical structures endowed with certain analogues of the developed topologies.

4. Methodology. The journal publishes scientific and methodological articles of direct practical application on all topics within the specialties of Mathematics, Computer Science, and Mechanics, as well as reviews of published educational materials in these fields.

The journal in school mathematical education pursues the goal of achieving «Mathematical maturity», the implementation project of which is presented in the article ‘Kazakh mathematical fairness in school education – equal conditions for everyone in textbooks and teachers’.

The journal in university mathematical education pursues the goal of achieving «Understanding mathematics», in which Mathematical Analysis plays the central role; a number of articles are devoted to the organization of the process of obtaining fundamental education.

4.1. Articles of methodological content.

The methodology of direct practical presentation of a key point of a curriculum or a scientific topic, developed in the course of scientific research, is presented in separate articles.

✓ *Temirgaliyev N. Predislovie Glavnogo redaktora zhurnala "Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika" o tselyakh izdaniya i putyakh ikh realizatsii [Introduction of the Editor-in-Chief of the journal "The Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics. Computer Science. Mechanics series" about the issue purposes and the ways of its implementation], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 122. № 1. P. 8-69.*

✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' II)» [Scientific, scientific-methodological and organizational report "The Institute of theoretical mathematics and scientific computing (ITMSC) L.N.Gumilyov Eurasian National University in 2019 year (Part II)"], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2020. Vol. 132. № 3. P. 31-69.*

✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' IV)» [Scientific, scientific-methodological and organizational report "The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part IV)"], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2021. Vol. 137. № 4. P. 25-59.*

✓ *Taugynbayeva G.E., Zhubanysheva A.Zh., Tabyldiyeva Zh.K., Temirgaliyev N. Metodika obucheniya chislom i primenyaemym k nim operatsiyam slozheniya i umnozheniya v nachal'noy shkole i lezhashchie v ikh osnove obshchie problemy [Methods of teaching numbers and the*

operations of addition and multiplication applied to them in elementary school and the general problems related to them], *Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika* [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 138. № 1. P. 45-54.

✓ Zhubanysheva A.Zh., Taugynbayeva G.E., Nauryzbayev N.Zh., Temirgaliyev N. *Ob odnom problemnom momente v uchebnikakh po teorii veroyatnostey* [About one Problematic Moment in Textbooks on Probability Theory], *Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika* [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 140. № 3. P. 15-22.

✓ Temirgaliyev N., Nurtazina, K., Taugynbayeva G.E., Zhubanysheva A.Zh. *Kazakhskaya matematicheskaya spravedlivost' v shkol'nom obrazovanii – eto ravnye dlya vseh usloviya v obuchayushchikh uchebnikakh i uchitelyakh* [Kazakhmath ematical justice in school education is equal conditions for all in teaching textbooks and teachers], *Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika* [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2024. Vol. 148. № 3. P. 26-99.

An idea of the content of methodological articles is given by the following descriptions of three of them. There is a well-known textbook by A.N. Kolmogorov and S.F. Fomin «Elements of the Theory of Functions and Functional Analysis», in which the independent theories mentioned in its title are presented in the reverse order – first «Functional Analysis», and then «The Theory of Measure and the Lebesgue Integral». This sharply impoverishes the illustrative part of Functional Analysis, since concrete examples of functional spaces and operators in them are based on the Theory of Measure and the Lebesgue Integral, which the authors cannot yet use; therefore they limit themselves only to discrete examples. Likewise, the inaccessibility of the Theory of Measure and the Lebesgue Integral when presenting generalized functions leads to incorrect texts, since the Riemann integral does not provide the necessary properties.

There is a textbook of Mathematical Analysis by the Editor-in-Chief of the Journal, in which Mathematical Analysis is presented over 2000 pages of text with such a level of detail that the reader does not need to be in a qualified mathematical environment. In addition, in the SYNOPSIS-TABLE OF CONTENTS of this textbook a method of extended titles is used for 155 paragraphs and 891 items across 21 chapters – the contents of the textbook are supplied with synopsis explanations, which apparently constitutes a novelty in educational literature. The entire methodology of presenting the theory of Mathematical Analysis is described in a special article of the Journal.

Even studying at Cambridge may initially fail to ensure «Understanding mathematics» for a capable student if there is no solid course in Mathematical Analysis; for the famous G.H. Hardy, once he realized this, such a course was provided

by Camille Jordan's textbook «Cours d'analyse», in contrast to the multitude who never realized this and therefore remained without understanding.

The notions of «Rigour – Understanding», which are not easily compatible in educational literature, find their resolution in a format of deep understanding of the subject combined with sensitivity to the accessibility of the methodology of presentation.

4.2. Without the section «Methodology», prior to the division into series, publications were carried out in the journal «Bulletin of L.N. Gumilyov Eurasian National University»:

- ✓ *Temirgaliev N., Zhainibekova M., Vokaze K. O nekotorykh «ponyatnykh» ponyatiyakh shkol'noy matematiki [On some “understandable” concepts of school mathematics], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Gumanitarnye nauki [Bulletin of the L.N. Gumilyov Eurasian National University. Humanities]. 2011. № 1(80). P. 33–38.*
- ✓ *Temirgaliev N. Printsipy sozdaniya i provedeniya ekspertizy uchebnikov po matematike [Principles of creating and conducting the examination of mathematics textbooks], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Gumanitarnye nauki [Bulletin of the L.N. Gumilyov Eurasian National University. Humanities]. 2009. Vol. 72. № 5. P. 35–43.*

5. The Journal publishes scientific and organizational proposals aimed at activating large-scale scientific and methodological activities.

As examples of the Journal's scientific and organizational publications, we present:

- ✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' I)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part I)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2020. Vol. 130. \No 1. P. 8-51.*
- ✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' II)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMSC) L.N.Gumilyov Eurasian National University in 2019 year (Part II)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2020. Vol. 132. \No 3. P. 31-69.*
- ✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' III)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part III)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki.*

Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2021. Vol. 135. \No 2. P. 12-63.

✓ *Temirgaliyev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' IV)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part IV)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2021. Vol. 137. \No 4. P. 25-59*

and also before the division into series

✓ *Dzhumakaeva G.T., Temirgaliyev N. Metod analiza vozrastnykh sposobnostey uchaschikhsya k usvoyeniyu uchebnogo materiala [Method for analyzing students' age-related abilities to master educational material], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva [Bulletin of the L.N. Gumilyov Eurasian National University]. 2011. T. 80. № 1. P. 39–50.*

6. The section «Memory» is dedicated to the legacy of prominent members of the scientific community in the journal's fields.

An example of a publication is the article:

✓ *Temirgaliyev N. Nauryzbayev Kabdush Zhumagazievich kak etalon «Ponimaniya Matematiki» [Nauryzbayev Kabdush Zhumagazievich as a standard of “Understanding Mathematics”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 139. № 2. P. 77–80.*

«Memory», without such a section before the division into series, publications were carried out in the journal «Bulletin of the L.N. Gumilyov Eurasian National University»:

✓ *Temirgaliyev N. Neskol'ko slov vospominaniy o moem druge i uchitele Sergeye Voronine [A few words of reminiscence about my friend and teacher Sergey Voronin], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva [Bulletin of the L.N. Gumilyov Eurasian National University]. 2016. Vol. 115. No 6. P. 46–64.*

✓ *Temirgaliyev N. Matematika-informatika Kazakhstana – vpered «po-Ibrashevski!» [Mathematics and Computer Science of Kazakhstan – forward “in the Ibrashev style!”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva [Bulletin of the L.N. Gumilyov Eurasian National University]. 2017. Vol. 117. No 2. P. 46–56.*

7. The journal «Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series», as part of the Kazakh scientific and organizational system, participates in the formation of effective management structures throughout the Education and Science System of the Republic of Kazakhstan through the publication of materials on Mathematics, Computer Science, and Mechanics. The journal adheres to the following positions:

- Promoting the development of scientific communications within the Education and Science System of the Republic of Kazakhstan, forming scientific schools and directions around the Journal, providing informational support for priority scientific research, and popularizing scientific ideas;
- Interacting with and engaging leading domestic and foreign specialists in publications and peer review;

- Providing opportunities for researchers, faculty members, doctoral and master's students, and undergraduate students to publish the results of their fundamental and applied research with theoretical, applied, and practical significance and novelty, and to inform the national and international professional community about the latest scientific results;
- Implementing state policy on the training of highly qualified personnel in the Republic of Kazakhstan;
- Offering the Journal's scientific platform for establishing new ideas in the international space in detailed form and for their discussion;
- Improving the quality of scientific articles through systematic work of the Journal's Editorial Board with authors according to the Journal's established requirements for article structure;
- Integrating Kazakhstan into the global scientific community;
- Maintaining high scientific standards by involving leading specialists in the peer review process;
- Striving to reduce the period of editorial processing of articles;
- Integrating Kazakh researchers into the international scientific community;
- Developing the Journal as an open-access scientific publication;
- Expanding the Journal's presence in international databases and open electronic resources;
- Increasing the accessibility of the Journal to a wide range of readers in the international scientific space, through the adopted article format by publishing in English an extended presentation of research novelty (Abstract), keywords (Keywords), and duplicating the reference list in the Latin alphabet (References);
- The Journal strives to maintain the highest level of integrity of the published content.

In the section «Scientific and Organizational Article», an article was published «Temirgaliyev N. K voprosu o nauchno-issledovatel'skoy i nauchno-metodologicheskoy otchetnosti i kontrolye [On the issue of scientific-research and scientific-methodological reporting and control], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2025. Vol. 152. No 3».

8. Requirements of the Editorial Board for the content and structure of articles. In the Journal, in the context of «Scientific novelty is knowledge that is substantive, new, and previously unknown in the scientific space», materials of the following types are published: Research Article, Scientific-Methodological Article, Scientific-Organizational Article, Short Communication, Feature Article of the Journal Issue, sections «Memory», «Review of Educational and Scientific Publications», and «Information Analytics».

The length of research articles ranges from 8 to 16 pages, the length of a short communication ranges from 5 to 7 pages, and the length of sections ranges from 2 to 5 pages. The calculation of the length of all three types of articles and the Short Communication does not include the abstract, keywords, the reference list in the

original language and in English, or information about the author(s) in Kazakh, Russian, and English. Scientific articles exceeding the specified length are accepted for publication in exceptional cases by a special decision of the Journal's Editorial Board.

8.1. Research articles, in terms of structure, must represent a completed study with a detailed formulation of the problem posed, a full justification of the necessity of the research objective in the context of the development of the field, and a clear formulation of the obtained result (the consideration and completeness of these requirements are determined by the reviewers and the Editorial Board of the Journal). Separately or in combination, they must contain the following information:

- *Necessary notation and definitions to ensure understanding of the text of the article,*
- *Formulation of the problem to which the article is devoted,*
- *Historical information on the formulation of the problem with corresponding full references in connection with the subject of the article – who and when obtained the results preceding the topic of the article,*
- *Justification of the relevance either as a problem new to the field under study or necessary for its further development, which constitutes the task of the article as the most important part of any scientific work,*
- *Precise formulation and description of the solution to the posed problem presented in the article,*
- *Detailed justification of the novelty of the result(s) of the article as new, previously unknown, and substantive in the context of what was known earlier,*
- *The solution of the problem presented in the article must be supplied with complete and detailed proofs,*
- *Conceptual model of the research subject – a structured scheme of key components (primary attention is given to results of a final character both within a specific specialization and of fundamental significance).*

If at least one of these requirements is not satisfied, the article is not accepted for consideration.

8.2. Short Communication. The requirements for a Short Communication are the same as for a Research Article, except that detailed proofs may be replaced by an outline of the proof.

8.3. Scientific-Methodological Article. The Journal publishes scientific-methodological articles of direct practical application with methodological significance and novelty, presenting new methods, tools, forms, approaches, principles, and foundations for the presentation and transmission of knowledge in all areas of the specialties Mathematics, Computer Science, and Mechanics. Scientific-methodological articles must represent a completed study devoted to the presentation of a specific curriculum topic, an entire field, or a subject discipline, with a detailed

formulation of the methodological problem posed, a full justification of the necessity of the research objective in the context of the development of the subject discipline against the general background of requirements of systematicity, precision of terminology, clear exposition of theoretical components, logical coherence and structure, accessibility and clarity in the presentation and transmission of knowledge (the consideration and completeness of these requirements are determined by the reviewers and the Editorial Board of the Journal). Separately or in combination, they must contain the following information:

- *Conceptual model of the subject of research – a structured scheme of key components for the creation of a complete set of school textbooks in Mathematics aimed at the ultimate goal «Mathematical maturity», the elevation of university courses to the level ensuring «Understanding», and the foundational preparation for mastering the diverse «Variable component»,*
- *Clear formulation of the methodological problem – a fundamental uncertainty or contradiction requiring resolution,*
- *Justification of the necessity and relevance of the methodological problem under development,*
- *Solution of the methodological problem and its principal novelty in the context of previously known methodologies.*

8.4. Scientific-Organizational Article. The Journal publishes scientific and organizational proposals aimed at activating large-scale scientific and methodological activities:

- *scientific conferences in the context of effectiveness,*
- *grant funding with corresponding competitive documentation and expert evaluation,*
- *textbooks and curricula for the school mathematics course with the final goal of achieving «Mathematical maturity»,*
- *educational programs for Master's and PhD studies with the intermediate goal of achieving «Understanding mathematics»,*
- *scientific programs for Master's and PhD studies aimed at integrating students of all levels into international science,*
- *expert evaluation and requirements for experts of various appointments: for scientific evaluation only specialists with Fundamental results are involved, exceptionally those with Significant results; for methodological evaluation, at least three results of direct practical application with theoretical preparation in the subject area are required,*
- *awarding academic degrees with corresponding documentation and evaluation: only specialists with Fundamental results are involved in awarding academic degrees, exceptionally those with Significant results,*

- *awarding academic titles with corresponding documentation and evaluation: the title of professor requires the mandatory presence of a Fundamental result, associate professor and docent require a Significant result,*
- *peer review of textbooks and monographs with corresponding documentation: for reviewing textbooks, specialists with at least five results of direct practical application and with theoretical preparation in the subject area close to the topic of the textbook are involved; for monographs, specialists with Fundamental results in areas close to the topic of the monograph are involved,*
- *documentation of scientific-research and scientific-methodological reporting and control, where every reporting and контроль document in science must contain explicit formulations of scientific novelty with full justification against the state of the Topic and the Field in the international scientific space at that time,*
- *training of scientific personnel with corresponding reporting and control documentation,*
- *journal scientific-research, scientific-methodological, and scientific-organizational policy: a scientific journal must include topics of Master's and PhD dissertations, promote scientific research at the international level for Kazakhstan, and be free from scientific errors and from the absence of meaningful and effective results.*

8.5. The «Feature Article of the Journal Issue» is devoted to a specific topic or field based on Fundamental results, with continuations aimed at development in Kazakhstan and integration into the international scientific space, without any restrictions on the format or length of presentation.

8.6. The section «Review of Educational and Scientific Publications» is devoted to the scientific and methodological analysis of textbooks and monographs.

8.7. The section «Memory» is devoted to the legacy of prominent representatives of the scientific community in the journal's fields.

8.8. The section «Information Analytics» is devoted to significant scientific events—conferences and seminars, scientific collaborations with global research centers, off-site scientific-research and scientific-methodological seminars in national and regional universities and secondary schools of the Republic of Kazakhstan, and presentations of national projects in Mathematics, Computer Science, and Mechanics.

9. The work of the Editorial Board on the peer review of articles submitted to the Journal. The primary role in developing the Journal's objectives is carried out through the coordinated activity of the Editorial Board with specially invited reviewers—highly qualified specialists having direct or closely related results in the subject area of the article. At the same time, the review must necessarily contain a description of the reviewer's own introduction to the subject matter of the article and of the results of the article as a whole, an assessment of the relevance and necessity of the problem posed, the presence or absence of scientific novelty in the context of preceding studies, a precise and complete formulation of the main results of the article,

and a fully justified conclusion on acceptance for publication, rejection, or further work with proposed revisions to the article.

Sample structure of a Review of an article:

Review of an article submitted to the journal «Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series»

Title of the article: _____

1. Does the topic and content of the article correspond to the scope of the journal?

- yes, it corresponds,
- partially, _____ (*it is necessary to specify what revisions the authors should make*),
- no, it does not correspond (the article should not be considered for review due to mismatch with the journal's scope),

2. Description of the reviewer's vision of the article in the context of the general state of the field and the place of the article's results within it,

3. Justification of the necessity and relevance of the study,

4. Detailed justification of the novelty of the result(s) of the article in the context of previously known results,

5. Precise formulation and description by the reviewer of the solution to the problem presented in the article,

6. Comments (scientific, technical, grammatical):

7. Presentation and formatting:

7.1) Does the title reflect the content of the article?

- yes,
- no, _____ (*it is necessary to specify what revisions the authors should make*),
- partially, _____ (*it is necessary to specify what revisions the authors should make*),

7.2) The bibliography provided:

- well selected,
- absent,
- requires revision: _____ (*it is necessary to specify what revisions the authors should make*),

8. Conclusion:

- The article is recommended for publication
- The article may be considered for publication after revisions in accordance with the reviewer's comments
- The article is not recommended for publication _____ (*it is necessary to justify the reason for rejection*)

Academic title, academic degree, position,
place of work of the reviewer

Full name of the reviewer,
date and signature

10. Complete list of «Feature Articles of the Journal Issue». The Journal has published 21 such articles with a total length of 650 pages, the latest of which is «The inverse $C(N)D$ as a direct formula-based solution (without neural networks) of the AI-ML problem for any smooth Mathematical model, with the idea of further development

through the creation of new Mathematical structures for non-smooth problems with their own «topologies»».

For a comprehensive understanding of the know-how «Feature Article of the Journal Issue», we present their full list:

1. Temirgaliyev N. Predislovie Glavnogo redaktora zhurnala "Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika" o tselyakh izdaniya i putyakh ikh realizatsii [Introduction of the Editor-in-Chief of the journal "The Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics. Computer Science. Mechanics series" about the issue purposes and the ways of its implementation], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 122. № 1. P. 8-69.
2. Temirgaliyev N. Elementarnoe postroenie lineynoy kongruentnoy posledovatel'nosti Lekhmera s toy stepen'yu sluchaynosti, s kakoy trebovaniyam sluchaynosti otvechaet spektral'nyy test Koveyu i Makfersona [Elementary construction of the linear congruent Lehmer sequence with the degree of randomness that is required by the spectral test of Coveyou and MacPherson], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 123. № 2. P. 8-55.
3. Temirgaliyev N., Zhubanysheva A.Zh. Teoriya priblizheniy, Vychislitel'naya matematika i Chislennyy analiz v novoy kontseptsii v svete Komp'yuternogo (vychislitel'nogo) poperechnika [Approximation Theory, Computational Mathematics and Numerical Analysis in new conception of Computational (Numerical) Diameter], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 124. № 3. P. 8-88.
4. Tirgaliyev N. Teorii vlozheniy i priblizheniy v kontekste $K(V)P$ i vnutrennikh problem teorii funktsiy [Embedding and Approximation Theories in the Context of Computational (Numerical) Diameter and Internal Problems of the Theory of Functions], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2018. Vol. 125. № 4. P. 8-68.
5. Temirgaliyev N., Taugynbayeva G.Y., Abikenova Sh.K. Diskretizatsiya resheniy uravneniy v chastnykh proizvodnykh v kontekste Komp'yuternogo (vychislitel'nogo) poperechnika [Discretization of solutions of partial differential equations in the context of Computational (numerical) diameter], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2019. Vol. 126. № 1. P. 8-51.
6. Temirgaliyev N. Preobrazovaniya i absolyutnaya skhodimost' trigonometriceskikh ryadov Fur'e [Transformation and Absolute Convergence of Trigonometric Fourier Series], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2019. Vol. 127. № 2. P. 8-26.
7. Temirgaliyev N. Kontseptsiya S.M. Voronina v probleme sravneniy determinirovannykh i sluchaynykh vychisleniy v odnikh i tekh zhe terminakh [The Concept of S.M.Voronin in the Problem of Comparisons in the Same Terms of Deterministic and Random Computation], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Informatika. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2019. Vol. 128. № 3. P. 8-33.

8. Temirgaliev N., Abikenova Sh. K., Azhgaliev Sh.U., Taugynbaeva G.E., Zhubanysheva A.Zh. Theory of Radon Transform in the Concept of Computational (Numerical) Diameter and Methods of the Quasi-Monte Carlo Theory, Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series. 2019. Vol. 129. \No 4. P. 8-53.
9. Temirgaliev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' I)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part I)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2020. Vol. 130. \No 1. P. 8-51.
10. Temirgaliev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' II)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMSC) L.N.Gumilyov Eurasian National University in 2019 year (Part II)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2020. Vol. 132. \No 3. P. 31-69.
11. Temirgaliev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' III)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part III)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2021. Vol. 135. \No 2. P. 12-63.
12. Temirgaliev N. Nauchnyy, nauchno-metodicheskiy i organizatsionnyy otchet «Institut teoreticheskoy matematiki i nauchnykh vychisleniy (ITMiNV) Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva v 2019 godu (chast' IV)» [Scientific, scientific-methodological and organizational report “The Institute of theoretical mathematics and scientific computing (ITMandSC) L.N.Gumilyov Eurasian National University in 2019 year (Part IV)”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2021. Vol. 137. \No 4. P. 25-59.
13. Taugynbayeva G.E., Zhubanysheva A.Zh., Tabyldiyeva Zh.K., Temirgaliev N. Metodika obucheniya chislom i primenyaemym k nim operatsiyam slozheniya i umnozheniya v nachal'noy shkole i lezhashchie v ikh osnove obshchie problemy [Methods of teaching numbers and the operations of addition and multiplication applied to them in elementary school and the general problems related to them], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 138. \No 1. P. 45-54.
14. Zhubanysheva A.Zh., Taugynbayeva G.E., Nauryzbayev N.Zh., Temirgaliev N. Ob odnom problemnom momente v uchebnikakh po teorii veroyatnostey [About one Problematic Moment in Textbooks on Probability Theory], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N.

- Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 140. \No 3. P. 15-22.
15. Sherniyazov K. Optimal'nye metody priblizhennogo vosstanovleniya funktsiy i resheniy uravneniy v chastnykh proizvodnykh vychislitel'nymi agregatami po lineynym kombinatsiyam setok Korobova so sverkh-szhatiem informatsii i smezhnye voprosy [Optimal methods for approximate recovery of functions and solutions of partial differential equations by computational units by linear combinations of Korobov grids with information supercompression and related issues], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 139. \No 2. P. 26-76.
16. Temirgaliyev N. Nauryzbaev Nauryzbaev Kabdush Zhumagazievich kak etalon «Ponimaniya Matematiki» [Kabdush Zhumagazievich as a standard of "Understanding Mathematics"], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 139. \No 2. P. 77-80.
17. Temirgaliyev N., Taugynbayeva G.E., Zhubanysheva A.Zh. Formula Plansherelya dlya preobrazovaniya Radona v gibkoy shkale gil'bertovykh prostranstv Soboleva [Plancherel's formula for the Radon transform in the flexible scale of Sobolev Hilbert spaces], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2022. Vol. 141. \No 4. P. 42-50.
18. Temirgaliyev N., Abikenova Sh.K., Azhgaliyev Sh.U., Nurmoldin Y.Y., [Taugynbayeva G.E., Zhubanysheva A.Zh. Ekvivalentnoe svedenie zadach Komp'yuternoy tomografii k razrabotannoy zadache vosstanovleniya funktsiy v vide konechnoy svertki v normakh «gibkikh» gil'bertovykh prostranstv Soboleva i Soboleva-Radona po skheme Komp'yuternogo \(vychislitel'nogo\) poperechnika](#) [Efficient reduction of Computed Tomography problems to the developed problem of recovery functions in the form of a finite convolution in the norms of "flexible" Hilbert Sobolev and Sobolev-Radon spaces according to the scheme of the Computational (numerical) diameter], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2023. Vol. 142. \No 1. P. 35-69.
19. Temirgaliyev N., Nurtazina, K., Taugynbayeva G.E., Zhubanysheva A.Zh. [Kazakhskaya matematicheskaya spravedlivost' v shkol'nom obrazovanii – eto ravnye dlya vsekh usloviya v obuchayushchikh uchebnikakh i uchitelyakh](#) [Kazakhmath ematical justice in school education is equal conditions for all in teaching textbooks and teachers], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Seriya Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series]. 2024. Vol. 148. \No 3. P. 26-99.
20. Zhubanysheva A. Ж., Nauryzbaev H. Ж., Taugynbayeva Г. E., Nurtazina K. Б., & Temirgaliyev N. Nalichie statisticheskoi regulyarnosti v paradokse Monti Kholla na avtorskikh sluchainykh algoritmakh [Statistical Regularity in the Monty Hall Paradox Using Proprietary Random Algorithms], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian National University. Mathematics, Computer Science, Mechanics Series]. 2025. Vol. 152. \No 3. P. 30–59.
21. Temirgaliyev N. K voprosu o nauchno-issledovatel'skoi i nauchno-metodologicheskoi otchetnosti i kontrole [On the issue of research and scientific-methodological reporting and control], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of L.N. Gumilyov Eurasian

National University. Mathematics, Computer Science, Mechanics Series]. 2025. Vol. 153. No. 4. P. 6-91.

22. Temirgaliyev N. Obratnoe $K(V)P$ kak pryamoe formul'noe reshenie (bez neyrosetey) AI ML-problemy dlya vsyakoy gladkoy matematicheskoy modeli s ideey dal'neyshego prodolzheniya s sozdaniem novykh matematicheskikh struktur dlya negladkikh zadach s svoimi «topologiyami» [Inverse $C(N)D$ as a direct formula-based solution (without neural networks) of AI/ML problems for any smooth mathematical model with the idea of further continuation through the creation of new mathematical structures for nonsmooth problems with their own “topologies”], Vestnik Evraziyskogo natsional'nogo universiteta imeni L.N. Gumileva. Matematika. Komp'yuternye nauki. Mekhanika [Bulletin of the L.N. Gumilyov Eurasian National University. Mathematics, computer science, mechanics series] – prepared for publication.

23. Temirgaliyev N. i ves ITMiNV. Metody AI-ML-analiza sotsialno-ekonomicheskogo sostoyaniya i perspektiv razvitiya malogo i srednego biznesa v rayonakh administrativnogo deleniya Kazakhstana po prirodno-klimaticheskim usloviyam i promyshlennym vozmozhnostyam (v klassifikatsiyakh s rayonnyimi osobennostyami) [Methods of AI-ML analysis of the socio-economic condition and development prospects of small and medium-sized businesses in the administrative districts of Kazakhstan according to natural-climatic conditions and industrial capacities (within classifications with district-specific features)] – prepared for publication.

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Authors should refrain from misrepresenting research results that could undermine trust in the Journal and should adhere to professionalism in scientific authorship and all scientific activities. Maintaining the integrity of research and its presentation is supported by compliance with good scientific practice, which includes:

A manuscript must not be submitted to more than one journal for simultaneous consideration. The submitted work must be original and must not have been published in another form or in any language (in part or in full), unless the new work represents an extension of previous work. When reusing materials, transparency with all necessary references must be ensured; presenting previously obtained results as new («self-plagiarism») is not permitted. A single study should not be divided into several parts for the purpose of increasing the number of publications in different journals or in one journal as independent articles in different issues. Results must be presented clearly and honestly, without falsification or inappropriate manipulation of data (including image-based manipulation). Authors must adhere to general mathematical, natural science, and interdisciplinary principles in the acquisition, selection, and processing of data. Data of other authors must not be presented as one's own. Verbatim copying of material must be indicated by quotation marks (to denote words, phrases, and sentences taken from other sources), and appropriate permissions must be obtained for copyrighted materials.

Authors should ensure that they have the right to use software, web surveys, and scales in their research (where applicable). Scientific articles and non-research materials (for example, Scientific-Organizational materials, sections «Memory», «Information Analytics») must cite relevant and appropriate literature to support the

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If there is suspicion of misconduct or alleged fraud, the Journal will conduct an investigation in accordance with its publication ethics policy, guided by the principles of COPE. If, after investigation, well-founded concerns are identified, the Editorial Office will contact the authors via the provided email address to allow the issue to be resolved. Depending on the situation, this may lead to the following measures, including but not limited to:

- If the manuscript is still under consideration, it may be rejected;
- If the article has already been published, it will be retracted, meaning that the article will remain available on the platform with a watermark «retracted», and an explanation of the retraction will be provided in a note associated with the watermark;
- The author's institution will be informed. A notice of suspected violation of ethical standards of the peer review system will be included in the bibliographic record of the author and the article.

The author provides a cover letter confirming the originality of the work and compliance with ethical standards. The cover letter must be prepared on the official letterhead of the organization and signed by the head of the organization (for universities, by the vice-rector responsible for research activities).

Template of a cover letter

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12. **Borrowing and plagiarism.** The Journal uses the software «Antiplagiat» <https://antiplagiat.enu.kz/> and the system «iThenticate (Turnitin)» to detect improper borrowings.

Authors of articles must guarantee that they have submitted a completely original work; in the case of using the work and/or quotations of other authors, bibliographic references or excerpts are mandatory. Appropriate references to the works of other authors are a required condition. Authors must cite publications that had a determining influence on the nature of the presented work and historically preceded the development of the topic of the article.

The Journal adheres to the principles of academic integrity and does not allow the publication of materials containing plagiarism, improper borrowings, or falsification of data.

Plagiarism is the appropriation of the results of another person's work in whole or in part without indicating the source: text, ideas, data, images, tables, methods, or formulas.

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Data falsification is the intentional distortion, fabrication, or manipulation of research data, results, or methods in order to present unreliable or misleading conclusions. Falsification includes: modification or selective exclusion of data, artificial «improvement» of results, substitution of original materials, presentation of non-existent data, as well as any other actions that violate the reliability and reproducibility of research.

All articles submitted to the Journal's editorial office are checked for the independence of authorship through the licensed automatic plagiarism detection system «Antiplagiat» and the system «iThenticate (Turnitin)».

«Antiplagiat»:

- The originality of the article (text reproduced from other sources) for acceptance for publication must be at least 80%.
- Articles with originality of 75–79% may be reconsidered by the Editorial Council from the standpoint of the necessity of the reproduced text from other sources for revealing the purpose and content of the article.
- Articles with originality below 75% or if it is established that the text was generated by artificial intelligence are not accepted.

Only manuscripts with originality of 80% or higher after verification through the antiplagiarism system are sent for further peer review.

«iThenticate (Turnitin)»:

- The total percentage of similarity must not exceed 20%.
- Articles with a similarity percentage in the range of 21%–25% may be reconsidered by the Editorial Council from the standpoint of the necessity of the reproduced text from other sources for revealing the purpose and content of the article.
- Articles with a similarity percentage of 26% or higher or if it is established that the text was generated by artificial intelligence are not accepted.

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Plagiarism in all its forms constitutes unethical behavior and is unacceptable.

Articles with confirmed significant similarities, as well as cases of plagiarism or self-plagiarism, will be rejected in accordance with international standards of publication ethics. Based on the combination of the similarity report and the expert assessment of reviewers, the Editorial Council of the Journal makes the final decision.

An author must not submit manuscripts describing essentially the same research to more than one journal. Submission of the same manuscript simultaneously to more than one journal is unethical behavior and unacceptable.

In general, an author should not submit for consideration to another journal an article that has already been published.

If plagiarism is identified after publication, the editorial office:

- publishes a notice of violation,
- if necessary, retracts the article (retraction),
- informs the organization where the author works.

13. **Peer review policy.** The primary purpose of peer review is to provide the Editorial Board with the information necessary to make a fair, evidence-based decision consistent with the journal's editorial criteria.

All submitted manuscripts are first evaluated by the journal editors for compliance with the journal's scope and the requirements for articles specified in Section «8. Requirements of the Editorial Board for the content and structure of articles». If the manuscript is deemed suitable for further consideration, it is then checked for technical requirements and submitted to a licensed system for detecting improper borrowings (see Section «12. Borrowing and plagiarism»). Thereafter, manuscripts admitted for consideration by the editor are sent to two reviewers for independent expert evaluation of scientific quality. The Journal adheres to double-blind peer review, in which the identities of authors and reviewers are mutually unknown.

The selection of reviewers is crucial to the publication process. It is based on multiple factors, including expertise, reputation, specific recommendations, conflict of interest, and previous achievements.

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[2] А. Утесов и Г. Утесова, К(Е)Д–қойылымында анизотропты жалпыланған Соболев класы функцияларын оптималды жуықтау, Вестник Еуразийского национального университета имени Л. Н. Гумилёва. Математика, компьютерные науки, механика серия 152 (2025), № 3, 22–29.
<https://doi.org/10.32523/bulmathenu.2025/3.2>

[3] А.Ж. Жубанышева и Ш.К. Абикенова, О нормах производных функций с нулевыми значениями заданного набора линейных функционалов и их применения к поперечниковым задачам, в Функциональные пространства и теория приближения функций: тезисы докладов Международной конференции, посвященной 110-летию со дня рождения академика С.М. Никольского, с. 141–142, 2015.

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<https://doi.org/10.32523/bulmathenu.2025/3.2> [in Kazakh]

[3] A. Zh. Zhubanysheva and Sh. K. Abikenova, O normah proizvodnyh funkciy s nulevymi znacheniyami zadannogo nabora linejnyh funkcionalov i ih primeneniya k poperechnikovym zadacham [On the norms of derivatives of functions with zero values of a given set of linear functionals and their application to transverse problems],

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[4] Е.А. Баилов, М.Б. Сихов и Н. Темиргалиев, Об общем алгоритме численного интегрирования функций многих переменных, *Журнал вычислительной математики и математической физики* 54 (2014), № 7, 1059–1077. <https://doi.org/10.7868/S0044466914070047>

has an official translation

[4] E.A. Bailov, M.B. Sikhov, and N. Temirgaliev, General algorithm for the numerical integration of functions of several variables, *Computational Mathematics and Mathematical Physics* 54 (2014), 1061–1078. <https://doi.org/10.1134/S0965542514070045>

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