

Report of the department of “Function Theory” on scientific and scientific-organizational activities for the year 2023

In the reporting period, 5 works connecting 6 researchers on the theme "Approximation of functions of many variables by ridge functions, neural networks, linear and nonlinear superpositions, and embedding theorems for functional spaces" were carried out. 7 papers were published. 4 of these articles were published in journals indexed in the databases Clarivate Analytics "Web of Science" and "Scopus". In addition, 3 articles were accepted for publication, and 1 article was submitted for publication.

The staff of “Function Theory” department consists of 7 researchers:

1. Vugar Ismailov - chief of the department (dr. math. sci., professor)
2. Alik Najafov - chief research assistant (dr. ph.-m. s., professor)
3. Rashid Aliev - chief research assistant (dr. math. sci., professor)
4. Ibrahim Maharov - senior research assistant (cand. ph.-m. s., associate professor)
5. Niyazi Ilyasov - senior research assistant (cand. ph.-m. s., associate professor)
6. Aygun Omarova - research assistant (phd in math.)
7. Aida Asgarova, - junior research assistant (phd in math.)

On scientific-organizational activity

Head of department doctor of mathematical sciences, prof. Vugar Ismailov gave a report on “Characterization of an extremal element in the problem of approximation by the sum of two algebras” at the institute seminar.

In the reporting period, the chief researcher of the department, dr. math. sci., prof., Rashid Aliev made a presentation on “Some problems in the representation by sums of ridge functions” at the institute seminar.

In the reporting period, the senior researcher of the department cand. ph.-m. s., associate professor, Niyazi Ilyasov made a presentation on “On various properties of periodic summable functions with only one condition on modulus of continuity of the second order” at the institute seminar.

On August 1-10, 2023, senior researcher of the department Niyazi Ilyasov was a member of the program committee of the “International School-Conference S. B. Stechkin on theoretical functions, dedicated to the 80-th anniversary of prof. V. V. Arestov” in Kyshtym, Chelyabinsk Region, Russia and made a plenary report on the topic "On “correct” estimates in the relations between the best approximations and the modules of smoothness of periodic functions in spaces $L_p(T)$, $1 < p < \infty$ ".

Head of department Vugar Ismailov was a reviewer of the journals: Neural Networks and Neural Processing Letters.

The chief researcher of the department, dr. math. sci., prof., Rashid Aliev was a reviewer of the journals: Mathematical Methods in the Applied Sciences, FİLOMAT, Complex Analysis and Operator Theory, Azerbaijan Journal of Mathematics, PIMM.

The chief researcher of the department, dr. math. sci., prof., Rashid Aliev led the team of Baku State University at the International Mathematical Olympiad among Students (IMC-2023), held from 31.07.2023 to 06.08.2023 in Blagoevgrad, Bulgaria. This team successfully represented our country at the International Mathematical Olympiad and for the first time brought a gold medal.

Head of the department

Dr.Math.Sci., prof. Vugar Ismailov

Publications:

Surnames, academic degrees and positions of collaborators	Names of scientific works	Printed or submitted for publication	Name of publisher, journal №, year	Page	Co-authors
1	2	3	4	5	6
Papers, published in journals indexed in the databases Clarivate Analytics "Web of Science" and "Scopus"					
1. Vugar Ismailov	1. "A three layer neural network can represent any multivariate function"	Paper	<i>Journal of Mathematical Analysis and Applications</i> 523 (1) (2023), Article 127096. https://www.sciencedirect.com/science/article/abs/pii/S0022247X23000999		
2. Alik Najafov	2. "On some embedding theorems in grand Nikolskii-Morrey spaces with dominant mixed derivatives"	Paper	<i>Trans. of A. Razmadze Math. Institute</i> v. 177, No. 1, 2023, 85-92. https://rmi.tsu.ge/transactions/TRMI-volumes/177-1/v177(1)-11.pdf	8	A. Eroglu, F.F. Mustafayeva
	3. "On some differential	Paper	<i>Communications Faculty of</i>	9	A. Eroglu, F.F. Mustafayeva

	properties of functions from generalized grand Sobolev-Morrey spaces”		<i>Sciences of Ankara ser. A1 Math. And Statistics</i> , 72(2) (2023), 429-437. https://doi.org/10.31801/cf suasmas.1171026		
3. Rashid Aliev	4. “Jackson-type theorem in the weak L_1 -space”	Paper	<i>Turkish Journal of Mathematics</i> , 47 (2023) , 185-194. https://doi.org/10.55730/1300-0098.3353	10	Ismailov E.
4. Niyazi Pyasov	5. “Порядковые равенства в пространствах $L_p(T)$, $1 < p < \infty$, для наилучших приближений и модулей гладкости производных периодических функций с монотонными коэффициентами Фурье”	Paper	Труды ИММ УрО РАН 2022, том 28, номер 4, 103-120. https://www.mathnet.ru/php/archive.phtml?ws how=paper&jr nid=tim&paperid=1954&option lang=rus	18	
Papers, published in other journals					

Rashid Aliev	6. “Boundedness of the Discrete Hilbert transform in Discrete Hölder spaces”	Paper	<i>Baku Mathematical Journal</i> , 2:1 (2023), 47-56. https://doi.org/10.32010/j.bmj.2023.04	10	Samadova L.G.
	7. “On the summability of the Riesz transform of Lebesgue integrable functions”	Paper	<i>Bakı Dövlət Universitetinin xəbərləri</i> , no.1 (2023), 17-25.	9	

Published abstracts

Alik Najafov	1.“On embedding theorems in generalized grand weighted Sobolev spaces”	Abstract	<i>Modern Problems of Mathematics and Mechanics</i> , Proceedings of the International Conference dedicated to the 100-th anniversary of the National Leader Heydar Aliyev, 26-28 April, 2023, Baku.	3	L.Sh. Gadimova
Rashid Aliev	2.“Discrete Hilbert	Abstract	<i>Modern</i>	3	Samadova L.G.

Ibrahim Maharov	<p>transform in Discrete Hölder spaces”</p> <p>3. “Upper bound for the approximation error of RBF neural networks with two hidden nodes”</p>	Abstract	<p><i>Problems of Mathematics and Mechanics, Proceedings of the International Conference dedicated to the 100-th anniversary of the National Leader Heydar Aliyev, 26-28 April, 2023, Baku, pp. 64-66.</i></p>	2	
Aida Asgarova	4. “Representation by a sum of algebras in the space of continuous functions”	Tezis	<p><i>Modern Problems of Mathematics and Mechanics, Proceedings of the International Conference dedicated to the 100-th anniversary of the National Leader Heydar Aliyev, 26-28 April, 2023, Baku, pp. 237-238.</i></p> <p><i>Modern Problems of Mathematics and Mechanics, Proceedings of</i></p>	2	

			the International Conference dedicated to the 100-th anniversary of the National Leader Heydar Aliyev, 26-28 April, 2023, Baku, p. 111-112.	
Papers, accepted for publication				
1. Vugar Ismailov	1. "A Chebyshev type alternation theorem for best approximation by a sum of two algebras"	Paper	<i>Proceedings of the Edinburgh Mathematical Society</i> (published online) https://www.cambridge.org/core/journals/proceedings-of-the-edinburgh-mathematical-society/article/abs/chebyshevt-type-alternation-theorem-for-best-approximation-by-a-sum-of-two-algebras/2B0E30C1CA74688D074E312EAF8BA7D7	Aida Asgarova, Ali Huseynli
2. Rashid Aliev	2. "Approximation of the Hilbert transform in	Paper	<i>Azerbaijan Journal of Mathematics</i>	Alizade L.Sh.

	Hölder spaces”		(WoS, Scopus)		
	3.“Approximation of the Hilbert transform in the Lebesgue spaces”	Paper	<i>Journal of Numerical Analysis and Approximation Theory</i> (Scopus)		Alizade L.Sh.

Head of the department

Dr.Math.Sci., prof. Vugar Ismailov