Laboratory of Mathematical Problems of Signal Processing
Institute of Mathematics and Mechanics,
Ministry of Science and Education
BRIEF ANNUAL REPORT ON SCIENTIFIC & ORGANIZATIONAL ACTIVITIES FOR THE 2024

During the reporting period 4 research works have been done in the field of "Application of modern mathematical methods to various identification problems" by the employees of the Laboratory of Mathematical Problems of Signal Processing.

There are 4 employees in the laboratory.
1. Sadigova Sabina Rahib kizi – Ph.D., Associate Prof.
2. Zabidov Zakir Jumshud oglu - Ph.D.
3. Aliyeva Khayala Mammadaga kizi –junior research assistant
4. Mirzabalayeva Asmar Idris kizi- junior research assistant

During the reporting period, the laboratory staff published 5 scientific articles (WOS; SCOPUS-2) and 5 theses in the proceedings of various international conferences.

Published articles:

1. Bilal T. Bilalov, Sabina R. Sadigova, Yonca Sezer, Natavan P. Nasibova. On solvability of polyharmonic Dirichlet problem in symmetric Sobolev spaces. Math. Meth. Appl. Sci. 2024;1–16. DOI: 10.1002/mma.10279 (**WOS, SCOPUS**) **IF=2.1 (SCIE)**
2. Bilalov, B.T., Sadigova, S.R. & Softova, L.G. Higher order elliptic equations in weighted Banach spaces. Ann Univ Ferrara (2024). https://doi.org/10.1007/s11565-024-00505-9 https://link.springer.com/article/10.1007/s11565-024-00505-9#Ack1 (**SCOPUS**)
3. S.R. Sadigova, A.I. Mirzabalayeva, M.H. Orujova. On the Basicity of double System of Exponents in the Weighted Lebesgue Space. Caspian Journal of Applied Mathematics, Ecology and Economics V. 12, No 1, 2024, pp. 51-68
4. Şükürov A.Ş., Zabidov Z.C., Qədirova X.M. RED, GREEN və BLUE spektral kanallarında alınmış təsvirlər əsasında bitkinin fizioloji inkişaf mərhələlərinin qiymətləndirilməsi. Azərbaycan Milli Aerokosmik Agentliyinin Xəbərləri, 2024, C.27, N 2(27), s.11-17.
5. Qədirova X.M. Müxtəlif indekslərin tətbiqi ilə ərazilərin bitki örtüyünün qiymətləndirilməsi, Azərbaycan Respublikası Elm və Təhsil Nazirliyi, Azərbaycan Texniki Universiteti, "Elmi əsərlər", №2, 2024, s. 73-76

Abstracts

1. S.R. Sadigova,, N.P. Nasibova, Fredholmness of the Dirichlet problem for 2m-th order elliptic equations in Grand Sobolev Spaces. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 267-268

2. Umit Ildiz, S.R. Sadigova, On basicity of some trigonometric system in Banach function spaces. XI International Scientific Conference "Modern Problems of Mathematics and

Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 333-335

3. Sadigova S.R., Ismailov N.A., Mirzabalayeva A.I. On the basicity of double system of exponents in the weighted Lebesgue space . IX International Conference "Modern Problems of Applied Mathematics and Information Technologies – Al-Khorezmiy 2024," which will be held on October 22-23, 2024, in Tashkent, Uzbekistan, pp. 336-337

4. Z.C. Zabidov, Kh.M. Gadirova, Assessment of physiological development stages of flowering of plants in the cultivated area using spectral analysis of images. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 74

5. Z.C. Zabidov, Kh.M. Gadirova, A.I. Mirzebalayeva, Assessment of vegetation cover of territories using various indices. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 75

GRANTS		
"Karabakh is Azerbaijan". grant competition by the Azerbaijan Science Foundation! (AEF-MQM-QA-1-2021-4(41)-8/02/1-M-02, 24.11.2022)	"Application of modern mathematical methods to the assessment of the current state and dynamics of agricultural fields according to spectral images"	Participants Zakir Zabidov and Xayala Aliyeva
"Main grant competition-2023" of the Azerbaijan Science Foundation dedicated to the 100th anniversary of the National Leader Heydar Aliyev (AEF-MCG-2023-1(43)-13/05/1-M-05,17.11.2023)	On Fredholmness of the elliptic equations in grand Sobolev spaces	Participant Asmar Mirzabalayeva
Azerbaijan Science Foundation "Main Grant Competition-2024" dedicated to the "Year of Solidarity for a Green World" AEF-MGC-2024-2(50)-16/02/1-M-02, 18.10.2024	"Development of Galerkin and Ritz methods for solving elliptic equations involving functional-degree plates in grand Sobolev spaces"	Sabina Sadigova (manager)

SUBMITTED PROJECT

Space Agency of the Republic of Azerbaijan (Azercosmos) Earth Observation Competition 2024	Evaluation of soil salinization in Kur-Araz lowland according to satellite data	Xayala Aliyeva (manager)

PEDAGOGICAL ACTIVITIES	
PhD, associate prof. Sabina Sadigova	Khazar University
Xayala Aliyeva	Khazar University

SOCIAL ACTIVITIES	
PhD, Associate Prof. Sabina Sadigova	• Member of the Academic Council of the Institute of Mathematics and Mechanics; • Secretary of the Women's Council of the Institute of Mathematics and Mechanics; • Editorial Assistant of Azerbaijan Journal of Mathematics; • Executive Editor of Caspian Journal of Applied Mathematics, Ecology and Economics; • Editorial Assistant of Journal of Contemporary Applied Mathematics.

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Sadıqova Səbinə Rahib qızı	46

Head of the laboratory :   **PhD, Associate Prof. Sabina Sadigova**