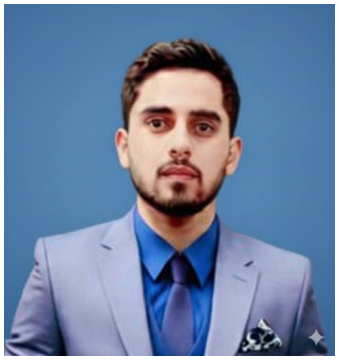
Waqar Afzal

Curriculum Vitae



Personal Information

Name: Waqar Afzal
Date of Birth: May 5, 1998
Nationality: Pakistan
Phone: +92 340 5583527
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Research Interests

Harmonic Analysis and PDEs
Mathematical Physics
Geometric Analysis
Operator Theory and Potential Analysis
Stochastic Analysis and Dynamical Systems
Numerical Analysis and Approximation Theory

Education

Ph.D. in Mathematics, Abdus Salam School of Mathematical Sciences, GC University Lahore. 2022 – 2026
Thesis: *Regularity of Elliptic and Parabolic Equations via Boundedness of Different Potentials in Harmonic Analysis*
CGPA: **3.16 / 4.00**
Advisor: **Prof. Dr. Mujahid Abbas** *View Profile*

M.Phil. in Mathematics, Government College University Lahore. 2019 – 2021
CGPA: **3.51 / 4.00**
Advisors: **Prof. Dr. Khurram Shabbir** *View Profile*, **Dr. Waqas Nazeer** *View Profile*

B.S. in Mathematics, University of Gujrat. 2015 – 2019
CGPA: **3.53 / 4.00**

Bachelor of Education, Allama Iqbal Open University, Islamabad. 2021 – 2022
GPA: **3.5 / 4.00**

Research Profile & Metrics

h-index:	15	**Total Publications:**	44
Cumulative Impact Factor:	> 120	**ORCID:**	0000-0001-7879-1920
ResearchGate:	View Profile	**Google Scholar:**	View Profile
Scopus Author ID:	60108343100	**Total Citations:**	450+

Publications

S.No	Publication	Year
1.	**W. Afzal**, "Boundedness and Regularity of the Navier–Stokes System in Generalized Herz Spaces via a Novel Fractional Potential Framework", *Chaos, Solitons & Fractals* (Q1)	2025
2.	**W. Afzal**, M. Abbas, N. M. Aloraini, J. Ro, "Resolution of open problems via Orlicz–Zygmund spaces and new geometric properties of Morrey spaces in the Besov sense with non-standard growth", *AIMS Mathematics* (Q1)	2025
3.	**W. Afzal**, "Regularity of Parabolic Ornstein–Uhlenbeck Equations via Boundedness of Fractional Muckenhoupt-Type Weighted Singular Operators in Variable Herz Spaces", *J. Pseudo-Differ. Oper. Appl.* (Q1)	2025
4.	**W. Afzal**, M. Alqahtani, M. Abbas, D. Breaz, "Regularity and Qualitative Study of Parabolic Physical Ginzburg–Landau Equations in Variable Exponent Herz Spaces via Fractional Bessel–Riesz Operators", *Fractal and Fractional* (Q1)	2025
5.	**W. Afzal**, M. Abbas, J. E. Macías-Díaz, A. Gallegos, Y. Almalki, "Boundedness and Sobolev-Type Estimates for the Exponentially Damped Riesz Potential with Applications to the Regularity Theory of Elliptic PDEs", *Fractal and Fractional* (Q1)	2025
6.	**W. Afzal**, M. Abbas, O. M. Alsalami, "Bounds of different integral operators in tensorial Hilbert and variable exponent function spaces", *Mathematics* (Q1)	2024
7.	**W. Afzal** and L.-I. Cotırlă, "New Numerical Quadrature Functional Inequalities on Hilbert Spaces in the Framework of Different Forms of Generalized Convex Mappings," *Symmetry* (Q2)	2025
8.	**W. Afzal**, N. M. Aloraini, M. Abbas, J. S. Ro, A. A. Zaagan, "Hermite–Hadamard, Fejér and Trapezoid Type Inequalities Using Godunova–Levin Preinvex Functions via Bhunia's Order and with Applications to Quadrature Formula and Random Variable," *Mathematical Biosciences and Engineering* (Q2)	2024
9.	**W. Afzal**, M. Abbas, J. E. Macías-Díaz, A. Gallegos, "Some New Fractional Interval-Valued Inequalities for Set-Valued H(α,1-α)-Godunova-Levin Mappings with Applications", *Contemporary Mathematics* (Q2)	2025
10.	**W. Afzal**, M. Abbas, J. E. Macías-Díaz, M. Z. Meetei, M. S. Khan, A. Gallegos, "Gradient Descent and Twice Differentiable Simpson-Type Inequalities via K-Riemann-Liouville Fractional Operators in Function Spaces", *European Journal of Pure and Applied Mathematics* (Q2)	2025
11.	**W. Afzal**, M. Abbas, M. Z. Meetei, S. Bourazza, "Tensorial Maclaurin Approximation Bounds and Structural Properties for Mixed-Norm Orlicz–Zygmund Spaces", *Mathematics* (Q1)	2025
12.	**W. Afzal**, M. Abbas, D. Breaz, L.-I. Cotîrlă, "Fractional Hermite–Hadamard, Newton–Milne, and Convexity Involving Arithmetic–Geometric Mean-Type Inequalities in Hilbert and Mixed-Norm Morrey Spaces with Variable Exponents", *Fractal and Fractional* (Q1)	2024
13.	**W. Afzal**, N. Aloraini, M. Abbas, J. S. Ro, A. A. Zaagan, "Some novel Kulisch-Miranker type inclusions for a generalized class of Godunova-Levin stochastic processes", *AIMS Mathematics* (Q1)	2024
14.	**W. Afzal**, M. Abbas, D. Breaz, L.-I. Cotîrlă, Z. Khan, E. Rapeanu, "Hyers–Ulam Stability of 2D-Convex Mappings and Some Related New Hermite–Hadamard, Pachpatte, and Fejér Type Integral Inequalities Using Novel Fractional Integral Operators via Totally Interval-Order Relations with Open Problem", *Mathematics* (Q1)	2024

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S.No	Publication	Year
15.	**W. Afzal**, M. Abbas, J. Ro, K. H. Hakami, H. Zogan, "An analysis of fractional integral calculus and inequalities by means of coordinated center-radius order relations", *AIMS Mathematics* (Q1)	2024
16.	**W. Afzal**, M. Abbas, W. Hamali, A. M. Mahnashi, M. De la Sen, "Hermite-Hadamard-Type Inequalities via Caputo-Fabrizio Fractional Integral for h-Godunova-Levin and (h_1, h_2)-Convex Functions", *Fractal and Fractional* (Q1)	2023
17.	**W. Afzal**, M. Abbas, S. M. Eldin, Z. A. Khan, "Some well known inequalities for (h_1, h_2)-convex stochastic process via interval set inclusion relation", *AIMS Mathematics* (Q1)	2023
18.	**W. Afzal**, K. Shabbir, M. Arshad, J. K. K. Asamoah, A. M. Galal, "Some Novel Estimates of Integral Inequalities for a Generalized Class of Harmonical Convex Mappings by Means of Center-Radius Order Relation", *Journal of Mathematics* (Q2)	2023
19.	**W. Afzal**, E. Yu. Prosviryakov, S. M. El-Deeb, Y. Almalki, "Some New Estimates of Hermite–Hadamard, Ostrowski and Jensen-Type Inclusions for h-Convex Stochastic Process via Interval-Valued Functions", *Symmetry* (Q2)	2023
20.	**W. Afzal**, K. Shabbir, S. Treanță, K. Nonlaopon, "Jensen and Hermite-Hadamard type inclusions for harmonical h-Godunova-Levin functions", *AIMS Mathematics* (Q1)	2023
21.	**W. Afzal**, W. Nazeer, T. Botmart, S. Treanță, "Some properties and inequalities for generalized class of harmonical Godunova-Levin function via center radius order relation", *AIMS Mathematics* (Q1)	2023
22.	**W. Afzal**, S. M. Eldin, W. Nazeer, A. M. Galal, "Some integral inequalities for harmonical cr-h-Godunova–Levin stochastic processes", *AIMS Mathematics* (Q1)	2023
23.	**W. Afzal**, T. Botmart, "Some Novel Estimates of Jensen and Hermite-Hadamard Inequalities for h-Godunova–Levin Stochastic Processes", *AIMS Mathematics* (Q1)	2023
24.	**W. Afzal**, K. Shabbir, T. Botmart, S. Treanta, "Some new estimates of well known inequalities for (h1, h2)-Godunova-Levin functions by means of center-radius order relation", *AIMS Mathematics* (Q1)	2023
25.	**W. Afzal**, M. Abbas, J. Macias Diaz, S. Treanta, "Some H-Godunova–Levin Function Inequalities Using Center Radius (Cr) Order Relation", *Fractal and Fractional* (Q1)	2022
26.	**W. Afzal**, A. Alub Lupas, K. Shabbir, "Hermite–Hadamard and Jensen-Type Inequalities for Harmonical (h_1, h_2)-Godunova–Levin Interval-Valued Functions", *Mathematics* (Q1)	2022
27.	**W. Afzal**, K. Shabbir, T. Botmart, "Generalized version of Jensen and Hermite-Hadamard inequalities for interval-valued (h1, h2)-Godunova-Levin functions", *AIMS Mathematics* (Q1)	2022
28.	**W. Afzal**, M. Abbas, K. Shabbir, "Some new integral bounds for Godunova-Levin functions via fractional integral operators", *Open Journal of Mathematical Sciences*, vol. 8, pp. 148–166	2024
29.	**W. Afzal**, M. S. Khan, M. Z. Meetei, M. Abbas, J. E. Macías-Díaz, H. Varlas-Rodriguez, et al., "Some New Fractional Hermite–Hadamard Type Inequalities for Generalized Class of Godunova–Levin Functions by Means of Interval Center-Radius Order Relation with Applications", *European Journal of Pure and Applied Mathematics* (Q2)	2024
30.	M. Israr, **W. Afzal**, S. Ahmad, D. Breaz, L.-I. Cotîrlă, "Enhancing Deep Image Prior with Multiscale Attention, SVD Pooling, and Preconditioned Optimizers for Image Processing", *European Journal of Pure and Applied Mathematics* (Q2)	2025

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S.No	Publication	Year
31.	N. Riaz, M. Abbas, **W. Afzal**, J. K. K. Asamoah, "Different Variations of Hermite-Hadamard Inequality Arising from New Generalized (m, h)-harmonic Godunova-Levin Preinvex Mappings", *Applied Mathematics and Information Sciences Letters* (Q3)	2025
32.	Z. A. Khan, **W. Afzal**, "An Estimation of Different Kinds of Integral Inequalities for a Generalized Class of Godunova–Levin Convex and Preinvex Functions via Pseudo and Standard Order Relations", *Journal of Function Spaces* (Q2)	2025
33.	Z. A. Khan, **W. Afzal**, M. Abbas, K. Nantomah, "Some Novel Inequalities for Godunova–Levin Preinvex Functions via Interval Set Inclusion ($\subseteq$) Relation", *Journal of Mathematics* (Q2)	2025
34.	Z. A. Khan, **W. Afzal**, W. Nazeer, J. K. K. Asamoah, "Some New Variants of Hermite–Hadamard and Fejér-Type Inequalities for Godunova–Levin Preinvex Class of Interval-Valued Functions", *Journal of Mathematics* (Q3)	2024
35.	A. A. H. Ahmadini, **W. Afzal**, M. Abbas, E. S. Aly, "Weighted Fejér, Hermite–Hadamard, and Trapezium-Type Inequalities for (h_1, h_2)–Godunova–Levin Preinvex Function with Applications and Two Open Problems", *Mathematics* (Q1)	2024
36.	Z. A. Khan, **W. Afzal**, M. Abbas, J. Ro, N. M. Aloraini, "A novel fractional approach to finding the upper bounds of Simpson and Hermite-Hadamard-type inequalities in tensorial Hilbert spaces by using differentiable convex mappings", *AIMS Mathematics* (Q1)	2024
37.	Z. A. Khan, **W. Afzal**, M. Abbas, J. S. Ro, A. A. Zaagan, "Some well known inequalities on two dimensional convex mappings by means of Pseudo LR interval order relations via fractional integral operators having non-singular kernel", *AIMS Mathematics* (Q1)	2024
38.	Y. Almalki, **W. Afzal**, "Some New Estimates of Hermite–Hadamard Inequalities for Harmonical cr-h-Convex Functions via Generalized Fractional Integral Operator on Set-Valued Mappings", *Mathematics* (Q1)	2023
39.	M. Abbas, **W. Afzal**, T. Botmart, A. M. Galal, "Jensen, Ostrowski and Hermite-Hadamard type inequalities for h-convex stochastic processes by means of center-radius order relation", *AIMS Mathematics* (Q1)	2023
40.	T. Saeed, **W. Afzal**, K. Shabbir, S. Treanță, M. De la Sen, "Some Novel Estimates of Hermite–Hadamard and Jensen Type Inequalities for (h_1, h_2)-Convex Functions Pertaining to Total Order Relation", *Mathematics* (Q1)	2022
41.	T. Saeed, **W. Afzal**, M. Abbas, S. Treanță, M. De la Sen, "Some New Generalizations of Integral Inequalities for Harmonical cr-(h_1, h_2)-Godunova–Levin Functions and Applications", *Mathematics* (Q1)	2022
42.	X. Zhang, K. Shabbir, **W. Afzal**, H. Xiao, D. Lin, "Hermite–Hadamard and Jensen-Type Inequalities via Riemann Integral Operator for a Generalized Class of Godunova–Levin Functions", *Journal of Mathematics* (Q2)	2022
43.	M. Tariq, **W. Afzal**, M. Nadeem, A. E. Munoz-Zavala, J. E. Macías-Díaz, "Novel Fractional Hermite–Hadamard and Product-Type Inequalities via Raina Function and Preinvex Mappings with Entropy Applications", *European Journal of Pure and Applied Mathematics* (Q2)	2025
44.	Y. Almalki, **W. Afzal**, K. Shabbir, D. Breaz, L.-I. Cotîrlă, A. Albaity, "New structural properties and Hermite–Hadamard inequalities for Godunova–Levin mappings via a novel analytical approach", *Research in Mathematics* (Q1)	2025

Research Talks & Presentations

A Stochastic Framework for the Analysis of Dynamical Epidemiological Systems
Watch on YouTube *Lahore University of Management Sciences (LUMS), Lahore, Pakistan*

Boundedness, Regularity, and Topological Properties in Function Spaces
View Zoom Recording *Department of Mathematics, Yıldız Technical University, Turkey*

Convex Optimization Problems and Mathematical Inequalities
Watch on YouTube *Abdus Salam School of Mathematical Sciences (ASSMS), GC University Lahore, Pakistan*

International Research Collaborations & Co-authorship

Prof. Mujahid Abbas University of Johannesburg	**South Africa**
Prof. Daniel Breaz "1 Decembrie 1918" University of Alba Iulia	**Romania**
Prof. Jorge E. Macías-Díaz Tulane University	**USA**
Prof. Savin Treanță National University of Science and Technology Politehnica Bucharest	**Romania**
Prof. Manuel de la Sen University of the Basque Country	**Spain**
Prof. Sotiris K. Ntouyas University of Ioannina	**Greece**
Prof. Jessada Tariboon King Mongkut's University of Technology North Bangkok	**Thailand**
Prof. Armando Gallegos University of Guadalajara	**Mexico**
Prof. Joshua Kiddy Kwasi Asamoah Kwame Nkrumah University of Science and Technology	**Ghana**
Prof. Evgenii Prosviryakov Ural Federal University, Yekaterinburg	**Russia**
Prof. Zareen Khan Princess Nourah bint Abdulrahman University	**Saudi Arabia**

International Certifications

Harvard University (USA)
- **Fat Chance: Probability from the Ground Up**
  View PDF: 70866fac70bd47ab8a327574bc0b4e0c

Massachusetts Institute of Technology (USA)
- **Advanced Calculus**
  View PDF: 8b1fc7f6275d4fe6945bfa030c66e474
- **Introduction to Differential Equations**
  View PDF: b038bd5a489945b6ab91b1aaee5e5f57

École Polytechnique Fédérale de Lausanne (Switzerland)
- **MATLAB and Octave**
  View PDF: 8325eb001f4c48148cd3cc4308671a54

University of Sydney (Australia)
- **Introduction to Calculus**
  View PDF: V4CK5QMRTCPT

Universidad Nacional Autónoma de México (Mexico)
- **Álgebra Básica**
  View PDF: 4BCKJAUUH57B

Wesleyan University (USA)
- **Introduction to Complex Analysis**
  View PDF: 2BWQ7AMEB4F7

Employment History

Visiting Lecturer, Government College University Lahore (Pakistan) 2021–2022

Courses Taught

- Introduction to Harmonic Analysis
- Advanced PDEs: Elliptic, Parabolic, and Hyperbolic Equations
- Functional Analysis and Operator Theory
- Stochastic Analysis and PDEs
- Real Analysis
- Complex Analysis
- Numerical Analysis

Awards and Honors

Fully Funded Ph.D. Scholarship, Abdus Salam School of Mathematical Sciences, GC University Lahore — 2022–2026

CIMPA School on Analysis and Numerics of Partial Differential Equations, Cape Coast, Ghana — 2024

CIMPA School on Algebraic and Combinatorial Methods in Geometry, LUMS, Pakistan — 2024

Shortlisted Finalist, Best Young Research Scholar Award, ASSMS, GCU Lahore — 2023

Second Position, M.Phil. Mathematics, GC University Lahore — 2021

Second Position, B.S. Mathematics, University of Gujrat — 2019

Merit-Based Laptop Award, Government of Punjab — 2018

International Research Visit

Host Institution: Universidad Autónoma de Aguascalientes, Mexico
Supervisor: Prof. Jorge E. Macías-Díaz
Duration: 6 months (2024)
Focus: Boundedness of Operators in Harmonic analysis

Editorial and Review Activities

Guest & Academic Editor, *Contemporary Mathematics* — 2023–present

Reviewer for: *Analysis and Mathematical Physics*, *Chaos Solitons & Fractals*, *Journal of Mathematical Analysis and Applications*, *Fractal and Fractional*, *Symmetry*, *Mathematics*, *AIMS Mathematics*, *Boundary Value Problems*, *and 15+ other international journals*

Technical Skills

Mathematical Software:	LaTeX, MATLAB, Mathematica, Maple, R, Origin
Programming:	Python (NumPy, SciPy, SymPy, Matplotlib, Pandas)
Office Tools:	Microsoft Office Suite, Google Workspace, Overleaf
Languages:	English (Fluent), Urdu (Native), Punjabi (Native), Spanish (Basic)

References

Prof. Mujahid Abbas
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Ph.D. Research Supervisor

Prof. Khurram Shabbir
Department of Mathematics, GC University Lahore
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M.Phil. Research Supervisor

Prof. Jorge E. Macías-Díaz
Autonomous University of Aguascalientes, Mexico
jemacias@correo.uaa.mx — +52 449 452 7006
International Research Supervisor (6 months)

Prof. Ali Akgül
Department of Mathematics, Siirt University, Turkey
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Project collaborator