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Education

2011-2014 PhD in Computational Mathematics - [University of Engineering & Technology, Peshawar, Pakistan](#)
Thesis Title: Wavelets and Radial Basis Functions in Scientific Computing

2003-2005 MS in Mathematics - [Lahore University of Management Sciences, Lahore, Pakistan](#)

1993-1995 MSc in Mathematics - [University of Peshawar, Peshawar, Pakistan](#)

1991-1993 BA - [University of Peshawar, Peshawar, Pakistan](#)

Apr 2002 - Sep 2002 Post Graduate Computer Orientation Course - Computer Training Center, Islamabad, Pakistan

Aug 2001 Sun Certified Programmer for the Java 2 Platform (JCP)

Employment History

Permanent Faculty Positions

May 10, 2022 [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Present *Professor*

Dec 2, 2015 - May 9, 2022 [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Associate Professor

Feb 8, 2011 - Dec 1, 2015 [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Assistant Professor

Jan 2009 - [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Feb 2011 *Lecturer*

Sep 1999 - [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Jan 2006 *Lecturer*

Visiting/Adjunct Faculty Positions

Sep 2008- [Lahore School of Economics, Lahore, Pakistan](#)
Jan 2009 *Visiting Faculty*

Jan 2006- [Lahore University of Management Sciences, Lahore, Pakistan](#)
Jun 2008 *Adjunct Faculty*

Administrative Experience

March 2016- [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Dec 2024 *Chairman/Head of Department*

Sep 2009- [Department of Mathematics, University of Peshawar, Peshawar, Pakistan](#)
Aug 2013 *Coordinator BS program*

Research Area

- Computational Mathematics

Research Interests

- Numerical Integration
- Numerical Methods for Boundary-Value Problems
- Numerical Methods for Integral and Integro-Differential Equations
- Numerical Methods for Partial Differential Equations
- Numerical Methods for Highly Oscillatory Integrals
- Collocation Methods using Wavelets
- Meshless Method using Radial Basis Functions

Journal Publications

1. Laique Zada, **Imran Aziz**, Numerical solution of fractional partial differential equations via Haar wavelet, Numerical Methods for Partial Differential Equations, 38 (2022) 222-242.
[doi: 10.1002/num.22658](https://doi.org/10.1002/num.22658)
2. **Imran Aziz**, Muhammad Nisar, Siraj-ul-Islam, On the numerical solution of some differential equations with nonlocal integral boundary conditions via Haar wavelet, Proceedings of the Estonian Academy of Sciences, 71 (1) (2022) 30-54.
[doi: 10.3176/proc.2022.1.03](https://doi.org/10.3176/proc.2022.1.03)
3. Sidra Saleem, Malik Zawwar Hussain, **Imran Aziz**, An approximation of one-dimensional nonlinear Kortweg de Vries equation of order nine. PLoS ONE 17(1) (2022): e0262157.
[doi: 10.1371/journal.pone.0262157](https://doi.org/10.1371/journal.pone.0262157)
4. Neslisah Imamoglu Karabas, Sila Ovgu Korkut, Gamze Tanoglu, **Imran Aziz**, Siraj-ul-Islam, An efficient approach for solving nonlinear multidimensional Schrödinger equations, Engineering Analysis with Boundary Elements, 132 (2021) 263-270.
[doi: 10.1016/j.enganabound.2021.07.009](https://doi.org/10.1016/j.enganabound.2021.07.009)
5. Laique Zada, **Imran Aziz**, The numerical solution of fractional Korteweg-de Vries and Burgers' equations via Haar wavelet, Mathematical Methods in the Applied Sciences, 44 (2021) 10564-10577.
[doi: 10.1002/mma.7430](https://doi.org/10.1002/mma.7430)
6. Sidra Saleem, Malik Zawwar Hussain, **Imran Aziz**, A reliable algorithm to compute the approximate solution of KdV-type partial differential equations of order seven, PLoS ONE 16(1) (2021): e0244027.
[doi: 10.1371/journal.pone.0244027](https://doi.org/10.1371/journal.pone.0244027)
7. **Imran Aziz**, Qurat-ul-Ain, Numerical solution of partial integro-differential equations with weakly singular kernels, Advanced Mathematical Models & Applications 5(2) (2020) 149-160
8. Sidra Saleem, **Imran Aziz**, Malik Zawwar Hussain, A simple algorithm for numerical solution of non-linear parabolic partial differential equations, Engineering with Computers 36 (2020) 1763-1775.
[doi: 10.1007/s00366-019-00796-z](https://doi.org/10.1007/s00366-019-00796-z)
9. Nosheen Pervaiz, **Imran Aziz**, Haar wavelet approximation for the solution of cubic nonlinear Schrodinger equations, Physica A: Statistical Mechanics and its Applications 545 (2020) 123738, 1-17.
[doi: 10.1016/j.physa.2019.123738](https://doi.org/10.1016/j.physa.2019.123738)
10. Nadeem Haider, **Imran Aziz**, Siraj-ul-Islam, Numerical solution of 2D and 3D elliptic-type interface models with regular interfaces, Engineering with Computers 35 (3) (2019) 1081-1102.
[doi: 10.1007/s00366-018-0652-0](https://doi.org/10.1007/s00366-018-0652-0)
11. **Imran Aziz**, Imran Khan, Numerical solution of diffusion and reaction-diffusion partial integro-differential equations, International Journal of Computational Methods, 15 (06), 1850047 (2018), 1-24.
[doi: 10.1142/S0219876218500470](https://doi.org/10.1142/S0219876218500470)
12. Siraj-ul-Islam, Nadeem Haider, **Imran Aziz**, Meshless and multi-resolution collocation techniques for parabolic interface models, Applied Mathematics and Computation, 2018, 335 (2018) 313-332.
[doi: 10.1016/j.amc.2018.04.044](https://doi.org/10.1016/j.amc.2018.04.044)
13. Maarjuss Kirs, Kristo Karjust, **Imran Aziz**, Erko Ounapuu, Ernst Tungel, Free vibration analysis of a functionally graded material beam: evaluation of the Haar wavelet method, Proceedings of the Estonian Academy of Sciences, 67 (1) (2018) 1-9.
[doi: 10.3176/proc.2017.4.01](https://doi.org/10.3176/proc.2017.4.01)
14. **Imran Aziz**, Siraj-ul-Islam, Nadeem Haider, Meshless and multi-Resolution collocation techniques for steady state interface models, International Journal of Computational Methods, 15, 1750073 (2018) 1-37.
[doi: 10.1142/S0219876217500736](https://doi.org/10.1142/S0219876217500736)
15. **Imran Aziz**, Imran Khan, Numerical solution of partial integro-differential equations of diffusion type, Mathematical Problems in Engineering, 2853679 (2017) 1-11.
[doi: 10.1155/2017/2853679](https://doi.org/10.1155/2017/2853679)

16. **Imran Aziz**, Siraj-ul-Islam, Muhammad Asif, Haar wavelet collocation method for three-dimensional elliptic partial differential equations, *Computers and Mathematics with Applications* 73 (9) (2017) 2023-2034.
[doi:10.1016/j.camwa.2017.02.034](https://doi.org/10.1016/j.camwa.2017.02.034)
17. **Imran Aziz**, Siraj-ul-Islam, An Efficient Modified Haar Wavelet Collocation Method for Numerical Solution of Two-Dimensional Elliptic PDEs, *Differential Equations and Dynamical Systems*, 25 (2) (2017) 347-360.
[doi: 10.1007/s12591-015-0262-x](https://doi.org/10.1007/s12591-015-0262-x)
18. **Imran Aziz**, Rohul Amin, Numerical solution of a class of delay differential and delay partial differential equations via Haar wavelet, *Applied Mathematical Modelling*, 40 (2016) 10286-10299.
[doi: 10.1016/j.apm.2016.07.018](https://doi.org/10.1016/j.apm.2016.07.018)
19. **Imran Aziz**, Siraj-ul-Islam, Muhammad Nisar, An efficient numerical algorithm based on Haar wavelet for solving a class of linear and nonlinear nonlocal boundary-value problems, *CALCOLO*, 53 (2016) 621-633.
[doi: 10.1007/s10092-015-0165-9](https://doi.org/10.1007/s10092-015-0165-9)
20. **Imran Aziz**, Siraj-ul-Islam, Muhammad Fayyaz, Mohammad Azram, New Algorithms for Numerical Assessment of Nonlinear Integro-Differential Equations of Second-Order using Haar Wavelets, *Walailak Journal of Science and Technology*, 12 (11) (2015) 995-1007.
[doi: 10.14456/WJST.2015.39](https://doi.org/10.14456/WJST.2015.39)
21. Siraj-ul-Islam, **Imran Aziz**, Zaheer-ud-Din, Meshless methods for multivariate highly oscillatory Fredholm integral equations, *Engineering Analysis with Boundary Elements*, 53 (2015) 100-112.
[doi: 10.1016/j.enganabound.2014.12.007](https://doi.org/10.1016/j.enganabound.2014.12.007)
22. Siraj-ul-Islam, **Imran Aziz**, Masood Ahmad, Numerical solution of two-dimensional elliptic PDEs with nonlocal boundary conditions, *Computers and Mathematics with Applications*, 69 (2015) 180-205.
[doi: 10.1016/j.camwa.2014.12.003](https://doi.org/10.1016/j.camwa.2014.12.003)
23. **Imran Aziz**, Siraj-ul-Islam, Fawad Khan, A new method based on Haar wavelet for the numerical solution of two-dimensional nonlinear integral equations, *Journal of Computational and Applied Mathematics*, 272 (2014) 70-80.
[doi: 10.1016/j.cam.2014.04.027](https://doi.org/10.1016/j.cam.2014.04.027)
24. Siraj-ul-Islam, **Imran Aziz**, A.S. Al-Fhaid, An improved method based on Haar wavelets for numerical solution of nonlinear integral and integro-differential equations of first and higher orders, *Journal of Computational and Applied Mathematics*, 260 (2014) 449-469.
[doi: 10.1016/j.cam.2013.10.024](https://doi.org/10.1016/j.cam.2013.10.024)
25. Siraj-ul-Islam, **Imran Aziz**, A.S. Al-Fhaid, Ajmal Shah, A numerical assessment of parabolic partial differential equations using Haar and Legendre wavelets, *Applied Mathematical Modelling*, 37 (23) (2013) 9455-9481.
[doi: 10.1016/j.apm.2013.04.014](https://doi.org/10.1016/j.apm.2013.04.014)
26. Siraj-ul-Islam, **Imran Aziz**, Muhammad Fayyaz, A new approach for numerical solution of integro-differential equations via Haar wavelets, *International Journal of Computer Mathematics*, 90 (9) (2013) 1971-1989.
[doi: 10.1080/00207160.2013.770481](https://doi.org/10.1080/00207160.2013.770481)
27. **Imran Aziz**, Siraj-ul-Islam, New algorithms for the numerical solution of nonlinear Fredholm and Volterra integral equations using Haar wavelets, *Journal of Computational and Applied Mathematics*, Vol. 239 (2013) 333-345.
[doi: 10.1016/j.cam.2012.08.031](https://doi.org/10.1016/j.cam.2012.08.031)
28. **Imran Aziz**, Siraj-ul-Islam, Božidar Šarler, Wavelet collocation methods for the numerical solution of elliptic BV problems, *Applied Mathematical Modelling*, 37 (3) (2013) 676-694.
[doi: 10.1016/j.apm.2012.02.046](https://doi.org/10.1016/j.apm.2012.02.046)

29. Siraj-ul-Islam, **Imran Aziz**, Wajid Khan, Numerical integration of multi-dimensional highly oscillatory, gentle oscillatory and non-oscillatory integrands based on wavelets and radial basis functions, Engineering Analysis with Boundary Elements, 36 (2012) 1284-1295.
doi: [10.1016/j.enganabound.2012.01.008](https://doi.org/10.1016/j.enganabound.2012.01.008)
30. **Imran Aziz**, Siraj-ul-Islam, Wajid Khan, Quadrature rules for numerical integration based on Haar wavelets and hybrid functions, Computers and Mathematics with Applications, 61 (2011) 2770-2781.
doi: [10.1016/j.camwa.2011.03.043](https://doi.org/10.1016/j.camwa.2011.03.043)
31. Siraj-ul-Islam, Božidar Šarler, **Imran Aziz**, Fazal Haq, Haar wavelet collocation method for the numerical solution of boundary layer fluid flow problems, International Journal of Thermal Sciences, 50 (2011) 686-697.
doi: [10.1016/j.ijthermalsci.2010.11.017](https://doi.org/10.1016/j.ijthermalsci.2010.11.017)
32. Fazal Haq, Siraj-ul-Islam, **Imran Aziz**, Numerical solution of singularly perturbed two-point BVPs using non-uniform Haar Wavelets, International Journal for Computational Methods in Engineering Science & Mechanics, 12 (4) (2011) 168-175.
doi: [10.1080/15502287.2011.580828](https://doi.org/10.1080/15502287.2011.580828)
33. Siraj-ul-Islam, **Imran Aziz**, Božidar Šarler, The numerical solution of second-order boundary-value problems by collocation method with the Haar wavelets, Mathematical and Computer Modelling, 52 (9-10) (2010) 1577-1590.
doi: [10.1016/j.mcm.2010.06.023](https://doi.org/10.1016/j.mcm.2010.06.023)
34. Siraj-ul-Islam, **Imran Aziz**, Fazal Haq, A comparative study of numerical integration based on Haar wavelets and hybrid functions, Computers and Mathematics with Applications, 59 (6) (2010) 2026-2036.
doi: [10.1016/j.camwa.2009.12.005](https://doi.org/10.1016/j.camwa.2009.12.005)

Conferences and Workshops

Refereed Conference Papers

1. **Imran Aziz**, Shumaila Yasmeen, Rohul Amin, Haar wavelet method for numerical solution of pantograph functional differential equations, 6th International Conference on Control and Optimization with Industrial Applications, 11-13 July, 2018, Baku, Azerbaijan.
2. **Imran Aziz**, Rohul Amin, Jüri Majak, Numerical solution of a class of fractional delay differential equations via Haar wavelet, 11th International DAAAM Baltic Conference (Industrial Engineering) April 20-22, 2016, Tallinn, Estonia.
3. **Imran Aziz**, Numerical solution of system of nonlinear Fredholm and Volterra integral equations using Haar wavelet, International Conference on Recent Advances in Pure and Applied Mathematics (ICRA-PAM 2014), Nov 6-9, 2014, Antalya, Turkey.
4. **Imran Aziz**, Siraj-ul-Islam, An improved wavelet collocation method for numerical solution of two-dimensional elliptic partial differential equations, Third International Conference for Computational Method for Thermal Problems, June 2-4, 2014, Lake Bled, Slovenia.
5. **Imran Aziz**, Siraj-ul-Islam, An improved method based on Haar wavelets for numerical solution of nonlinear integral equations, International conference on Modelling and Simulation 2013 (ICOMS-2013), Islamabad, Pakistan.

Invited Lectures

- A new numerical method for numerical solution of integral equations based on Haar wavelet, First national conference on mathematics, May 4-5, 2017, University of Sargodha, Pakistan.
- Numerical solution of nonlinear Poisson equation by using Haar wavelet collocation method, Workshop on numerical solutions of nonlinear PDEs, June 26, 2015, Izmir Institute of Technology, Urla, Izmir, Turkey.

- Wavelets and scientific computing, Advanced workshop on finite difference methods for differential equations, March 13-17, 2015, South Asian University New Delhi, India.
- Haar wavelet in scientific computing, One day international workshop on computational mathematics with applications, March 10, 2014, Shaheed Benazir Bhutto women university, Peshawar, Pakistan.

Resource Person in Workshop

- Workshop on Randomness and Cryptography, April 29-30, 2006 organized by CASM at Lahore University of Management Sciences, Lahore, Pakistan.

Refereeing

Articles refereed for the following journals

1. Journal of Computational and Applied Mathematics (Elsevier)
2. Applied Numerical Mathematics (Elsevier)
3. Applied Mathematical Modelling (Elsevier)
4. Chaos, Solitons & Fractals (Elsevier)
5. Composite Structures (Elsevier)
6. Engineering Analysis with Boundary Elements (Elsevier)
7. Physica A: Statistical Mechanics and its Applications (Elsevier)
8. Computers & Mathematics with Applications (Elsevier)
9. Journal of Computational Science (Elsevier)
10. Journal of Franklin Institute (Elsevier)
11. Journal of Membrane Science (Elsevier)
12. Mathematics and Computers in Simulation (Elsevier)
13. Applied Mathematics and Computation (Elsevier)
14. Microprocessors and Microsystems (Elsevier)
15. Journal of Ocean Engineering and Science (Elsevier)
16. MethodsX (Elsevier)
17. JESTECH, Engineering Science and Technology, an International Journal (Elsevier)
18. Journal of the Association of Arab Universities for Basic and Applied Sciences (Elsevier)
19. Numerical Algorithms (Springer)
20. CALCOLO (Springer)
21. Computational and Applied Mathematics (Springer)
22. Journal of Inequalities and Applications (Springer)
23. Mediterranean Journal of Mathematics (Springer)
24. Journal of Ocean Engineering and Marine Energy (Springer)
25. Advances in Difference Equations (Springer)
26. SN Applied Sciences (Springer)
27. Differential Equations and Dynamical Systems (Springer)

28. Journal of Applied Mathematics and Computing (Springer)
29. SeMA Journal (Springer)
30. Mathematical Sciences (Springer)
31. Statistics and Computing (Springer)
32. International Journal of Computer Mathematics (Taylor & Francis)
33. Numerical Functional Analysis and Optimization (Taylor & Francis)
34. Inverse Problems in Science & Engineering (Taylor & Francis)
35. Engineering Optimization (Taylor & Francis)
36. Cogent Mathematics (Taylor & Francis)
37. Cogent Biology (Taylor & Francis)
38. Journal of Taibah University for Science (Taylor & Francis)
39. Mathematical Methods in the Applied Sciences (Wiley)
40. Numerical Methods for Partial Differential Equations (Wiley)
41. Heat Transfer (Wiley)
42. International Journal of Computational Methods (World Scientific)
43. International Journal of Modern Physics B (World Scientific)
44. Modern Physics Letters B (World Scientific)
45. International Journal of Geometric Methods in Modern Physics (World Scientific)
46. Nonlinear Engineering - Modeling and Application (De Gruyter)
47. Mathematics (MDPI)
48. AIMS Mathematics
49. Mathematical Modelling and Analysis
50. FILOMAT
51. Boletim da Sociedade Paranaense de Matemática
52. Ain Shams Engineering Journal
53. Sains Malaysiana
54. Walailak Journal of Science and Technology
55. Zeitschrift für Naturforschung A
56. Waves, Wavelets and Fractals - Advanced Analysis
57. Selcuk Journal of Applied Mathematics
58. Konuralp Journal of Mathematics
59. Sigma Journal of Engineering and Natural Sciences
60. Iranian Journal of Science and Technology
61. Iranian Journal of Numerical Analysis and Optimization
62. Asian Journal of Mathematics and Computer Research

Supervisions

MPhil/MS Thesis Supervision (Completed)

1. Numerical Solutions of Hyperbolic Partial Differential Equations via Haar Wavelet Method, 2019 (Asadul-lah Sohail).
2. Numerical solution of partial integro-differential equations with weakly singular kernels via Haar wavelet, 2018 (Qurat-ul-Ain).
3. Numerical solutions of fractional Fredholm integro-differential equations via Haar wavelet method, 2018 (Hajira).
4. Numerical Solution of elliptic partial integro-differential equations via Haar wavelet, 2018 (Tehzeeb Qazi).
5. Numerical solution of partial differential equations with integral boundary conditions by meshless method using radial basis functions, 2016 (Sumbel Begum).
6. Haar wavelet collocation method for numerical solution of functional differential equations, 2016 (Shumaila Yasmeen).
7. Numerical solution of parabolic and hyperbolic PDEs with integral boundary conditions via Haar wavelet, 2016 (Muhammad Nisar).
8. Numerical solution of boundary-value problems via Linear Legendre Multiwavelets, 2015 (Rooh Ullah).
9. A hybrid method for numerical solution of highly oscillatory integrals, 2014 (Amir Sultan Khan).
10. Numerical solution of a non-local boundary-value problem via Haar wavelets, 2014 (Tilawat Naz).
11. Haar wavelet method for numerical solution of third order boundary-value problems with nonlocal boundary conditions, 2014 (Aisha Ahmad).
12. Numerical solution of elliptic boundary-value problems via Chebyshev wavelet, 2014 (Laique Zada).
13. A comparative study of numerical solutions of linear & nonlinear boundary-value problems using Haar and Legendre wavelets, 2013 (Imran Khan).
14. Numerical solution of two-dimensional linear and nonlinear integral equations using Haar wavelets, 2013 (Fawad Khan).

PhD Thesis Supervision (Completed)

1. The numerical solution of fractional partial differential equations via Haar wavelet 2021 (Laique Zada).
2. Haar wavelet approximation for the solution of different types of Schrodinger equations 2021 (Nosheen Pervaiz).
3. Numerical solution of integral and integro-differential equations using linear Legendre multi-wavelets 2018 (Imran Khan).
4. Wavelet collocation method for numerical solution of 3D partial differential equations, 2017 (Muhammad Asif).
5. Numerical solution of ordinary and partial differential equations with interface conditions, 2017 (Nadeem Haider).
6. Haar wavelet approach for numerical solution of ordinary, partial and fractional differential equations with delay, 2016 (Rohul Amin).

Courses Taught

University of Peshawar, Peshawar, Pakistan

Graduate Level

- Numerical Analysis I
- Numerical Analysis II
- Computational Physics I
- Computational Physics II
- Functional Analysis I
- Computer Programming

Undergraduate Level

- Abstract and Linear Algebra
- Topology
- Real Analysis
- Complex Analysis
- Discrete Structures
- BASIC and FORTRAN Programming
- Programming in C
- MATLAB and Mathematica

Lahore University of Management Sciences, Lahore, Pakistan

Undergraduate Level

- Cryptography
- Probability
- Linear Algebra
- Ordinary Differential Equations
- Calculus II

Lahore School of Economics, Lahore, Pakistan

Undergraduate Level

- Calculus I

Iqra University, Peshawar, Pakistan

Undergraduate Level

- Calculus
- Mathematical Methods

Greenwich University, Peshawar, Pakistan

Undergraduate Level

- Calculus
- Multivariate Calculus

Computer Skills

Programming

- C, C++
- JAVA
- FORTRAN

Mathematical Softwares

- MATLAB
- Mathematica

Countries Visited

- Slovenia
- Turkey
- India
- Estonia
- Azerbaijan

References

1. Dr. Jüri Majak
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