

Curriculum Vitae

Farideh Ghoreishi

Current Address:

Department of Applied Mathematics,
Faculty of Mathematics,
K.N.Toosi University of Technology,
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Tel: (+98)21 77125254,

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Education:

1999-2004 **Tarbiat Modarres University**, Tehran, Iran.
Ph.D. in applied Mathematics.

1996-1999 **Iran University of Science and Technology**, Tehran, Iran.
M.Sc. in applied Mathematics.

1990-1994 **Al-Zahra University**, Tehran, Iran.
B.Sc. in Pure Mathematics.

Professional Experiments:

Rank 2 among B.Sc. students (50 students) in Al-Zahra University.

Rank 8 among more than of 1000 persons in national exam(1996).

Rank 14 among more than 1500 students in national exam to entering as M.Sc.
student in Iran Univ. Sci. Tech. (1996).

Assistant Professor in Applied Mathematics (2005 - 2012).

Associate Professor in Applied Mathematics (2012 - present).

Manager of the department of Applied Mathematics (2013- 2015, 2021-present).

Faculty of Science Award for Excellence in Teaching, K.N.Toosi Univ. of Tech (2013).

Skills:

Writing any code of numerical analysis in Mathematica.

Teaching:

- Introductory Numerical Analysis (under graduate level).
- Advanced Numerical Analysis (graduate level).
- Numerical Linear Algebra (graduate and undergraduate level).
- Mathematics Laboratory graduate level).

- Numerical Solution of Ordinary and Partial Differential equations (graduate level).
- Approximation Theory (graduate level).

Research Interest:

- Numerical Solution of Ordinary and Partial Differential equations.
- Spectral Methods (Pseudospectral, Tau and Galerkin Methods).
- Domain Decomposition methods.
- Weakly Singular Integral Equations.
- Numerical Analysis of Fractional Differential equations (Numerical Solvability and Convergence Analysis).
- Numerical Solution of Differential Algebraic Equations.
- Applications of Radial Basis Functions and Preconditioners.

Publications:

- [1] P. Mokhtary, F. Ghoreishi, Error analysis of the generalized Jacobi Galerkin method in nonlinear fractional differential equations, *Progress in Fractional Differentiation & Applications*, Accepted.
- [2] H. Ranjbar and F. Ghoreishi, A Gaussian quadrature rule for Fourier-type highly oscillatory integrals in the presence of stationary points, *J. Comput. And Appl. Math.*, 395, (2021) 113592. (Q1)
- [3] H. Ranjbar and F. Ghoreishi, A Hermite collocation method for approximating a class of highly oscillatory integral equations using new Gaussian radial basis functions, *Calcolo* 58 (2), (2021) 1-23. (Q1)
- [4] R. Ghaffari, F. Ghoreishi, A low-dimensional compact finite difference Method on Graded Meshes for time-fractional diffusion Equations, *Computational Methods in Applied Mathematics*, 21(4) (2021) 827-840.
- [5] C. G. Keshavarzi, F. Ghoreishi, Numerical solution of the Allen-Cahn equation by using "shifted" surface spline radial basis functions, *Iranian Journal of Numerical Analysis and Optimization*, 10 (2), 177-196.
- [6] R. Ghaffari, F. Ghoreishi, Error Analysis of the reduced RBF Model Based on POD Method For Time Fractional Partial Differential Equations, *Acta Appl. Math.*, 168 (1), (2020) 33-55.
- [7] F. Ghoreishi, C. G. Keshavarzi, Preconditioning RBF collocation method by adapted finite difference matrix, *Advances in Computational Mathematics*, 45(5) (2020), 3293-3325. (Q1)
- [8] R. Ghaffari and F. Ghoreishi, Reduced Collocation Method for Time-Dependent Parametrized Partial Differential Equations , *Bulletin Iran. Math. Soci.*, V. 45, (2019) 1487–1504.
- [9] R. Ghaffari and F. Ghoreishi, Reduced spline method based on a proper orthogonal decomposition technique for fractional sub-diffusion equations, *Appl. Numer. Math.*, V. 137 (2019) 62-79. (Q1)

- [10] F. Ghoreishi and E. Farahbakhsh, The Laguerre Collocation Method for the Third Kind Integral Equations on Unbounded Domains, *Comput. Meth. Appl. Math.*, DE GRUYTER, 16, 2 (2016) 245-256.
- [11] P. Mokhtary, F. Ghoreishi, H. M. Srivastava, The Mntz-Legendre Tau method for fractional differential equations *Appl. Math. Model.* 40(2) (2016) 671-684. (Q1)
- [12] A. Peiravi and F. Ghoreishi, Numerical solutions based on Chebyshev collocation method for singularly perturbed delay parabolic PDEs, *Math. Meth. Appl. Sci.*, 37, 14 (2014) 2112-2119.
- [13] M. Khasi, F. Ghoreishi and M. Hadizadeh, Numerical analysis of a high order method for state-dependent delay integral equations, *Numerical Algorithms*, 66, 1 (2014) 177-201.
- [14] M. Mokhtary and F. Ghoreishi, Convergence Analysis of Spectral Tau Method for Fractional Riccati Differential Equations, *Bull. Iran. Math. Soc.*, 40, 5 (2014) 1275-1290.
- [15] P Mokhtary, F. Ghoreishi, Convergence analysis of the operational Tau method for Abel-type Volterra integral equations *Elect. Trans. Numer. Anal.* 41, 1 (2014) 289-305.
- [16] P. Mokhtary and F. Ghoreishi, Spectral Collocation method for multi order fractional differential equations, *Int. J. Comput. Methods* 11, 5 (2014)13500728.
- [17] F. Ghanbari and F. Ghoreishi, Convergence Analysis of the Pseudospectral method for linear DAEs of Index-2, *Int. J. Comput. Methods*, 10, 4 (2013) .
- [18] S. Pishbin, F. Ghoreishi, M Hadizadeh, The semi-explicit Volterra integral algebraic equations with weakly singular kernels: The numerical treatments, *J. Comput. Appl. Math.*, 245, 9 (2013) 121-132.
- [19] F. Goodarzi, M. Hadiizadeh, F. Ghoreishi, An interval solution for the n-th order linear ODEs with interval initial conditions, *Mathematical Communications*, 18, 1 (2013) 257-270.
- [20] F. Ghoreishi, M. Hadizadeh, S. Pishbin, On the Convergence Analysis of the Spline Collocation Method for System of Integral Algebraic Equations of Index-2, *Int. J. Comput. Methods*, 9, 4 (2012) 1250048.
- [21] M. Hadizadeh, F. Ghoreishi and S. Pishbin, Jacobi Spectral Solution for Integral-Algebraic Equations of Index-2, *Appl. Numer. Math.* 61,1 (2011) 131-148.
- [22] S. Pishbin, F. Ghoreishi and M. Hadizadeh, A posteriori error estimation for the Legendre collocation method applied to Integral-Algebraic Volterra equations, *Elect. Trans. Numer. Anal.*, 38,10 (2011) 327-346.

- [23] B. Fakhr Kazemi, F. Ghoreishi, Error estimate in fractional differential equations using multiquadratic radial basis functions, *J. Comput. Appl. Math.*, 245 (2013) 131-147.
- [24] P. Mokhtary, F. Ghoreishi, The L_2 -Convergence of the Legendre Spectral Tau Matrix Formulation for Nonlinear Fractional Integro Differential Equations, *Numerical Algorithms*, 58, 4 (2011) 475-496.
- [25] F. Ghoreishi and S. Yazdani, An Extension of the Spectral Tau Method for Numerical Solution of Multi-order Fractional Differential Equations with Convergence Analysis, *Comput. Math. Appl.*, 61, 1 (2011) 30-43.
- [26] F. Ghoreishi and M. Hadizadeh, Numerical Computation of the Tau Approximation for the Volterra-Hammerstein Integral Equations, *Numer. Algorithms*, 52, 4 (2009) 541-559.
- [27] F. Ghoreishi and S. M. Hosseini, Integration matrix based on arbitrary grids with a preconditioner for pseudospectral method, *J. Comput. Appl. Math.*, 214, 1 (2008) 274-287.
- [28] F. Ghoreishi and S. M. Hosseini, The Tau Method and a New Preconditioner, *J. Comput. Appl. Math.* 163, 2 (2004) 351-379.
- [29] F. Ghoreishi and S. M. Hosseini, A Preconditioned Implementation of Pseudospectral methods on arbitrary grids, *Appl. Math. Comput.* 148, 1 (2004) 15-34.
- [30] M. T. Darvishi and F. Ghoreishi, Multidomain and preconditioning Schemes for Computing Higher Derivatives. *Far East J. Math. Sci. (FJMS)*, 1, 2 (1999) 297-316.
- [31] M. T. Darvishi and F. Ghoreishi, Error Reduction for Higher Derivatives of Chebyshev Collocation Method Using Preconditioning and Domain Decomposition., *Korean J. Comput. Appl. Math.* 6, 2 (1999) 421-435.

Refereed National and International Conference Proceedings:

- [32] M. Hosseini, F. Ghoreishi, A Preconditioned Pseudospectral Method for Fredholm Integro Differential Equations, *Modelling 2005, The Third IMACS Conference on Mathematical Modelling and Computational Methods in Applied Sciences and Engineering*, Czech Republic, 4-8 July 2005.
- [33] F. Ghoreishi, Efficient Preconditioning of the Pseudospectral Method for Nonlinear Two Dimensional Heat Equations, *8th International Seminar of Differential Equations, Dynamical Systems and Their Applications*, Isfahan University of Technology, Isfahan, Iran, (deds8) July, 2008.
- [34] P. Mokhtary and F. Ghoreishi, Numerical solution of Fractional Integro Differential Equations by Galerkin Method with an error estimation, *40th Annual Iranian Mathematics Conference*, Tehran, Iran, Sharif univ, (AIMC40) 2009.
- [35] F. Ghoreishi and E. Farahbakhsh, New Birkhoff-Type Quadrature formula for the third kind integral equations on unbounded domain, *5th Iranian conference on applied mathematics*, 8-10 Sep. 2013.

- [36] F. Ghoreishi and E. Farahbakhsh, Laguerre Collocation Method for the Third Kind Integral Equations on Unbounded Domains, 10th Seminar on Diff. Equ. Dyn. Sys. 6-7 Nov. 2013.
- [37] A. Baseri and F. Ghoreishi, Spline collocation method for stochastic differential Equations, 5th Iranian conferene on applied mathematics, 8-10 Sep. 2013.
- [38] F. Ghoreishi and M. Neemati, Spectral Collocation Method for Numerical Solution of Functional Eigenvalue Ordinary and Partial Differential Equations, 8th Seminar on Diff. Equ. Dyn. Sys. 6-7 Nov. 2013.

Submitted Papers:

- [1] With H. Ranjbar, On the convergence rates of a convolution quadrature rule for highly oscillatory integrals, 2021.
- [2] With C. Goli Keshavarzi, Numerical Approximation of Two dimensional Burgers Equation, 2021.
- [3] With H. Ranjbar, Numerical solution of Highly oscillatory Integral Equations.
- [4] With R. Ghaffari, New Multistep methods for numerical approximation of FDEs.

Research Projects:

- Title: Numerical solution of fractional differential equations, K. N. Toosi University of Technology (2008 /7 -2009/3).
- Title: Radial basis function for numerical solution of fractional differential equations, K. N. Toosi University of Technology (2009 /7 -2010/3).
- Title: Numerical solution of algebraic differential equations, K. N. Toosi University of Technology (2010/4 -2011/2).
- Title: Numerical analysis of fuzzy integral equations, K. N. Toosi University of Technology (2011/4 -2012/3).
- Title: Stochastic differential equations, by using spectral collocation methods, K. N. Toosi University of Technology (2012/4 -2013/2).
- Title: Spline collocation methods for Stochastic differential equations, K. N. Toosi University of Technology (2013/6 -2014/3).
- Title: Some preconditioners in radial basis function methods, K. N. Toosi University of Technology (2014/5 -2015/3).
- Title: Application of discontinuous Galerkin method for numerical solution of partial differential equations, K. N. Toosi University of Technology (2015/7 -2016/3).
- Title: Reduced order methods for partial differential equations, K. N. Toosi University of Technology (2016/4 -2017/3).
- Title: Numerical solution of the equations governing the electroosmotic current in the microchannel, K. N. Toosi University of Technology (2017/5 -2018/3).
- Title: Numerical methods for the propagation of electromagnetic waves equations, K. N. Toosi University of Technology (2018/6 -2019/3).
- Title: Numerical solution of Fredholm optimal control equations, K. N. Toosi University of Technology (2019/5 -2020/3).
- Title: Investigations on a finite class of q-orthogonal polynomials, K. N. Toosi University of Technology (2020/4 -2021/3).

Organizing Workshops:

Workshop on Integral Equations and Matrix Theory: Symbolic-Numeric Treatments (WIEMT2017), K.N.Toosi Univ. of Tech., Tehran, Iran (Scientific Committee member).

Conference Papers:

- [1] الهام رضا زاده و فریده قریشی، حل عددی معادلات انتگرال فوق منفرد خطی با استفاده از نظریه پایداري لبایانوف، چهارمین کنفرانس بین المللی ترکیبیات، رمزنگاری، علوم کامپیوتر و محاسبات، داخلی بین المللی، 2019.
- [2] فریده قریشی، روش های شبه طیفی کسری در حل معادلات دیفرانسیل و انتگرال کسری، چهل و نهمین کنفرانس ریاضی ایران، 2018.
- [3] R. Ghaffari and F. Ghoreishi, Reduced finite difference scheme based on a proper orthogonal decomposition technique for fractional sub-diffusion equations, The 49th Annual Iranian Mathematics Conference, 2018. (یکی از سه مقاله برتر انتخاب شده در کنفرانس)
- [4] C.G. Keshavarzi, F. Ghoreishi, Numerical solution of two dimensional Allen-Cahn equation by RBF collocation method, The 49th Annual Iranian Mathematics Conference, 2018.
- [5] C.G. Keshavarzi, F. Ghoreishi, Numerical weather prediction by augmented RBF collocation method, 14th International Seminar on Differential Equations Dynamical Systems and Applications, 2018.
- [6] R. Ghaffari and F. Ghoreishi, Spline method for the variable order time fractional diffusion equations, 13th International Seminar on Differential Equations Dynamical Systems and Applications, 2016.
- [7] P. Mokhtary and F. Ghoreishi, Condition Number Analysis of the Tau Method for FIDE's, 42th Annual Iranian Mathematics Conference, (AIMC42), University of Rafsanjan, Kerman, Iran, 2011.
- [8] S. Pishbin, M. Hadizadeh and F. Ghoreishi, The Numerical Solvability of weakly singular Integral Algebraic Equations of index-1, 42th Annual Iranian Mathematics Conference, AIMC42, University of Rafsanjan, Kerman, Iran, 2011.
- [9] P. Mokhtary and F. Ghoreishi, Orthogonal Collocation Method for Fractional Integro-Differential Equations, AIMC41, University of Urmia, Urmia-Iran, 2010.
- [10] P. Mokhtary and F. Ghoreishi, Numerical solution of Fractional Integro Differential Equations by Galerkin Method with an error estimation, 40th Annual Iranian Mathematics Conference, Tehran, Iran, Sharif univ, (AIMC40) 2009.
- [11] S. Pishbin, M. Hadizadeh and F. Ghoreishi, Matrix Vector Representation of Solution for Integral Algebraic equations, AIMC40, 2009.
- [12] M. Khasi and F. Ghoreishi and M. Hadizadeh, Numerical Solution of State Dependent Delay Integral Equations, Zahedan Univ., 2010.
- [13] S. Pishbin, F. Ghoreishi, on the approximate solution of integral Algebraic equations of index-1, 40th Annual Iranian Mathematics Conference, Tehran, Iran, Sharif Univ, (AIMC40) 2009.

- [14] S. Yazdani, M. Hadizadeh and F. Ghoreishi, Interval Solutions for Dynamical Model of a Chemical Reactor, kashan Univ., 2009.
- [15] F. Ghoreishi, Efficient Preconditioning of the Pseudospectral Method for Nonlinear Two Dimensional Heat Equations, 8th International Seminar of Differential Equations, Dynamical Systems and Their Applications, Isfahan University of Technology, Isfahan, Iran, (deds8) July, 2008.
- [16] F. Abedi, Multidomain Pseudospectral methods for Partial Differential Equations, AIMC38, Sept. 2007.
- [17] S. Karimi, F. Ghoreishi, The Tau Method For Numerical Solution of Delay Differential Equations. AIMC37, 2-5 Sept. 2006, Azarbaijan University ,Iran.
- [18] S. SeyedAlaei, F. Ghoreishi, M. Hadizadeh, Pseudospectral Numerical Solution Of The Nonlinear Two Dimensional Integral Equations, AIMC37, 2-5 Sept. 2006, Azarbaijan University, Iran.
- [19] M. Hosseini, F. Ghoreishi, A Preconditioned Pseudospectral Method for Fredholm Integro Differential Equations, Modelling 2005, The Third IMACS Conference on Mathematical Modelling and Computational Methods in Applied Sciences and Engineering, Czech Republic, 2005.
- [20] M. T. Darvishi, F. Ghoreishi, Preconditioned Multi-domain Schemes for Pseudospectral Differentiation Matrix, Numerical Analysis Conference, University of Imam Hossein, Iran (1998).

Graduate Supervision:

Ph.D. Students :

- [1] **P. Mokhtary**, Spectral Methods for Generalized Multi Order Fractional Differential Equations, (2008 - 2013).
- [2] **S. Pishbin**, Numerical Solution of the Integral Algebraic Equations, 2008 (Joint student with Dr. Hadizadeh) (2008 - 2012).
- [3] **R. Ghaffari**, Reduced order methods in Partial Differential Equations (2015-2019).
- [4] **C. G. Keshavarzi**, Numerical analysis of partial differential equations by using radial basis functions methods with appropriate preconditioner (2015-2020).
- [5] **H. Ranjbar**, Numerical Analysis of Some Highly Oscillatory operators Equations, (2017-2021).
- [6] **Z. Habibi** (2020- Present).
- [7] **Bakhshizadeh** (2021-Present).
- [8] **Ashwagh Alabd Alaziz** (Joint student with Dr. Hadizadeh) (2021 -Present).

M.Sc. Students:

- [1] **S. Barzegar**, (In Progress), Efficient collocation methods for Volterra Integral equations with highly oscillatory kernels.
- [2] **Z. Meshkat**, (In Progress), High-order numerical methods for fractional derivatives

- and related time fractional partial differential equations. (Joint student with Dr. Amir Aslani) (2008 - 2012).
- [3] **P. Mahmoudi**, (In Progress), Oscillation-preserving Legendre-Galerkin methods for second kind integral equations with highly oscillatory kernels.
 - [4] **R. Lotfi**, (2022), A finite class of q-orthogonal polynomials corresponding to Inverse gamma distribution.
 - [5] **M. Monazzam**, (2022), Solving nonlinear time-dependent partial equations using radial basis functions.
 - [6] **M. Golestani**, (2021), The convergence of collocation method in continuous piecewise polynomials spaces for weakly singular Volterra-integral equations.
 - [7] **M. Barmayeh Var**, (2020), extrapolation methods for the numerical solution of nonlinear Fredholm integral equations.
 - [8] **H. Sadeghi**, (2019), Convergence and stability of block boundary value methods applied to nonlinear fractional differential equations.
 - [9] **E. Baji**, (2019), Super-convergence of the discontinuous Galerkin method for second-order nonlinear ordinary differential equations with initial values.
 - [10] **E. Rezazadeh**, (2019), Numerical solution of linear and nonlinear hyper-singular Integral equations.
 - [11] **S. Sanjabian**, (2018), Fractional pseudo-Spectral methods in solving fractional differential equations.
 - [12] **Z. Tabaei**, (2018), Analytical and Computational Methods for a Class of Singular Nonlinear Integral Equations.
 - [13] **F. Bagheri**, (2017), Special orthogonal decomposition methods in numerical solution of partial differential equations.
 - [14] **L. Fathali Nejad**, (2017), A new finite difference method for the Burgers equation on unbounded domains.
 - [15] **N. Shiri**, (2017), Numerical solution of a system of polynomial and poly-analytical equations.
 - [16] **M. Khodadadi**, (2016), Numerical solution of nonlinear systems of equations by application to nonlinear partial differential equations.
 - [17] **N. Ramedani Bandpei**, (2015), Application of some effective numerical methods in stochastic differential equations.
 - [18] **M. Kamankesh**, (2015), Discontinuous Galerkin method in partial fractional differential Equations.
 - [19] **S. Saghafi**, (2015), Numerical solution of partial differential equations of fractional order by using radial basis functions .
 - [20] **B. Mirzaei Khandabi**, (2015), Rang-Kutta-Nistrom methods for ordinary second-order differential equations applied in multi-structural systems.
 - [21] **A. Joundarmian**, (2015), Spectral methods for solving Volterra-Type Integro-differential equations.
 - [22] **M. Salehi**, (2015), Some numerical methods for solving parabolic equations governing the propagation of electromagnetic waves.
 - [23] **S. Gebleh Soha**, (2015), Boundary Elements Method - Completely Discrete Finite Elements for the Nonlinear Class of Parabolic-Elliptic Problem.
 - [24] **S. Aboulhasani**, (2014), Some numerical methods for solving differential diffraction problems in two-dimensional space.
 - [25] **S. Bagherzadegan**, (2014), Numerical solution of operator equations using pad approximations.
 - [26] **A. Baseri**, (2013), Numerical analysis of random differential equations.
 - [27] **S. YarAhmadi**, (2013), Numerical solution of the equations governing the electroosmotic current in the microchannel.
 - [28] **M. Neemati**, (2013), Numerical analysis of eigenvalue problems in ordinary differential equations.
 - [29] **M. Babaeizadeh**, (2013), Applications of radial basis functions in approximation of differential equations.
 - [30] **S. Aghchi**, (2013), Numerical solution of Fredholm optimal control equations.

- [31] **S. Golalizadeh**, (2012), Numerical methods in integral equations of the third Type.
- [32] **Z. Ghorbani Vahid**, (2012), Quasi-spectral method in solving fractional optimal control problems.
- [33] **M. Karimi Ghahroudi**, (2012), Numerical analysis of differential equations and fuzzy integrals.
- [34] **F. Ghanbari**, (2012), Spectral methods in numerical analysis of algebraic differential equations.
- [35] **H. Arab**, (2012), Spectral methods in numerical solution of optimal control problems.
- [36] **F. Goudarzi**, (2012), Numerical solution of operational equations using verified methods.
- [37] **A. Ziaei**, (2011), Numerical solution of fuzzy operator equations by spectral Methods.
- [38] **M. Zamani**, (2011), Analytical and numerical study of some economic models using integral equations.
- [39] **L. Mohammadi**, (2010), Pseudo-Spectral effective techniques in spectral methods.
- [40] **B. Asadian**, (2010), Application of special functions in solving operational Equations.
- [41] **B. Fakhre Kazemi**, (2010), Numerical solution of fractional differential equations of multiple degrees by radial basis functions.
- [42] **M. Khasi**, (2009), Investigation of analytical and numerical methods of delayed integral equations.