ABBAS SAADATMANDI

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EDUCATION

Ph.D. Numerical Analysis, Amirkabir University of Technology, 2004

M.Sc. Numerical Analisis, Amirkabir University of Technology, 2000

B.Sc. Applied Mathematics , Sharif University of Technology, 1997

RESEARCH INTERESTS

Numerical Analysis, Spectral methods, Numerical methods for Differential and Integral equations, Fractional Differential equations, Sinc methods.

AWARDS AND HONORS

- **Leading researcher in the University of Kashan, 2010, 2012, 2014, 2016,2020**
- **The world top one percent highly-cited scientists, 2015, 2017, 2018, 2019, 2020**

PUBLICATIONS

Journal Papers

[1]: *M. Dehghan, A. Saadatmandi,* Bounds for solutions of a six-point partial-difference scheme, *Computers and Mathematics with Applications*, 47 (2004) 83-89.**

[2]: *A. Saadatmandi , M. Razzaghi,* A Tau method approach for the diffusion equation with nonlocal boundary conditions, *International Journal of Computer Mathematics*, 81(11) (2004) 1427-1432.**

[3]: *A. Saadatmandi, M. Razzaghi and M. Dehghan*, Sinc-Collocation methods for the solution of Hallen's integral equation, *Journal of Electromagn. Waves and Appl.,* 19(2) (2005) 245-256.**

[4]: *A. Saadatmandi, M. Razzaghi and M. Dehghan,* Sinc-Galerkin solution for nonlinear two-point boundary value problems with applications to Chemical reactor theory, *Mathematical and Computer Modelling*, 42 (2005) 1237-1244.**

[5]: *A. Saadatmandi, M. Razzaghi and M. Dehghan,* Hartley series approximations for the parabolicequations, *International Journal of Computer Mathematics*, 82(9) (2005) 1149–1156.

[6]: *A . Saadatmandi, M. Dehghan, A. Campo,* The Legendre-Tau technique for the determination of a source parameter in a semi linear parabolic equation, *Mathematical Problems in Engineering*,** Vol **2006 (2006) Article ID 70151, 1-11.**

[7]: *A. Saadatmandi, M. Razzaghi,* The numerical solution of third-order boundary value problems using Sinc-Collocation method, *Communications in numerical methods in engineering*, 23 (2007) 681–689.**

[8]: *A. Saadatmandi , M. Dehghan,* Numerical solution of the one-dimensional wave equation with an integral condition, *Numerical Methods for Partial Differential Equations,* 23 (2007) 282–292.

[9]: *M. Dehghan, A. Saadatmandi,* A Tau method for the one-dimensional parabolic inverse problem subject to temperature over specification, *Computers and Mathematics with Applications*, 52 (2006) 933–940.

[10]: *A. Saadatmandi , J. Askari farsangi*, Chebyshev finite difference method for a nonlinear system of second-order boundary value problems*, Applied Mathematics and Computation,* 192 (2007) 586–591.

[11]: *M. Dehghan , A. Saadatmandi*, Chebyshev finite difference method for Fredholm integro-differential equation*, International Journal of Computer Mathematics*, 85(1) (2008) 123–130.

[12]: *M. Dehghan , A. Saadatmandi*, The numerical solution of a nonlinear system of second-order boundary value problems using Sinc-collocation method*, Mathematical and Computer Modelling,* 46 (2007) 1434–1441.

[13]: *A. Saadatmandi, M. Dehghan,* Numerical solution of a mathematical model for capillary formation in tumor angiogenesis via the tau method, *Communications in numerical methods in engineering*,24 (2008) 1467–1474.

[14]: *A. Saadatmandi, M. Dehghan, A. Eftekhari,* Application of He's homotopy perturbation method for nonlinear system of second-order boundary value problems*, Nonlinear Analysis: Real World Applications,* 10 (2009) 1912–1922.

[15]: *A. Saadatmandi, M. Dehghan,* The numerical solution of problems in calculus of variation using Chebyshev finite difference method*, Physics Letters A*, 372 (2008) 4037–4040.

[16]: *A. Saadatmandi, M. Dehghan,* A collocation method for solving Abel's integral equations of first and second kinds, *Zeitschrift für Naturforschung A*., 63 (2008) 752-756.

[17]: *A. Saadatmandi, M. Dehghan,* Computation of two time-dependent coefficients in a parabolic partial differential equation subject to additional specifications, *International Journal of Computer Mathematics,* 87 (2010) 997-1008.

[18]: *M. Dehghan, A. Saadatmandi*, Variational iteration method for solving the wave equation subject to an integral conservation condition,*chaos Solitons & Fractals*, 41 (2009) 1448–1453.

[19]: *A. Saadatmandi, M. Dehghan,* Variational iteration method for solving a generalized pantograph equation, *Computers and Mathematics with Applications*, 58 (2009) 2190–2196.

[20]: *A. Saadatmandi, M. Dehghan,* Numerical solution of hyperbolic telegraph equation using Chebyshev tau method, *Numerical Methods for Partial Differential Equations,* 26 (2010) 239–252.

[21]: *M. Dehghan, J. Manafian , A. Saadatmandi*, Solving Nonlinear Fractional Partial Differential Equations Using the Homotopy Analysis Method, *Numerical Methods for Partial Differential Equations,* 26 (2010) 448–479.

[22]: *A. Saadatmandi , M. Dehghan,* A new operational matrix for solving fractional-order differential equations, *Computers and Mathematics with Applications*, 59 (2010) 1326–1336.

[23]: *A. Saadatmandi , M. Dehghan,* He's Variational Iteration Method for Solving a Partial Differential Equation Arising in Modelling of the Water Waves, *Zeitschrift für Naturforschung A*., 64 (2009) 783-787.

[24]: *A. Saadatmandi , M. Dehghan,* Numerical solution of higher-order linear Fredholm integro-differential-difference equation with variable coefficients, *Computers and Mathematics with Applications*, 59 (2010) 2996 – 3004.

[25]: *M. Dehghan, J. Manafian, A. Saadatmandi,* Analytical treatment of some partial differential equations arising in mathematical physics by using the Exp-function method, *International Journal of Modern Physics B.,* 25 (2011) 2965 – 2981.

[26]: ***M. Dehghan, J. Manafian, A. Saadatmandi,*** **Application of semi- analytic methods for the Fitzhugh-Nagumo equation which models the transmission of nerve impulses,** *Mathematical Methods in Applied Sciences,* **33 (2010) 1384 – 1398.**

[27]: ***M. Dehghan, J. Manafian, A. Saadatmandi*****, The Solution of the Linear Fractional Partial Differential Equations Using the Homotopy Analysis Method,** *Zeitschrift für Naturforschung A.***, 65 (2010) 935–949**.

[28]: ***M. Dehghan, J. Manafian, A. Saadatmandi,*** **Application of the Exp-function method for solving a partial differential equation arising in biology and population genetic,** *International Journal of Numerical Methods for Heat and Fluid Flow,* **21 (2011) 736–753**.

[29]: ***A. Saadatmandi , M. Dehghan,*** **A Legendre collocation method for fractional integro-differential equations ,** *Journal of Vibration and Control,* **17 (2011) 2050-2058.**

[30]: ***A. Saadatmandi , M. Dehghan,*** **A method based on the tau approach for identification of a time-dependent coefficient in the heat equation subject to an extra measurement,** *Journal of Vibration and Control,* **18 (2012) 1125-1132.**

[31]: ***A. Saadatmandi, M. Dehghan,*** **A tau approach for solution of the space fractional diffusion equation,** *Computers and Mathematics with Applications,* **62 (2011) 1135–1142**.

[32]: ***A. Saadatmandi , M. Dehghan,*** **The use of Sinc-collocation method for solving multi-point boundary value problems,** *Communications in Nonlinear Science and Numerical Simulation,* **17 (2012) 593–601**.

[33]: ***A. Saadatmandi, M. Dehghan , M.R. Azizi,*** **The Sinc–Legendre collocation method for a class of fractional convection–diffusion equations with variable coefficients,** *Communications in Nonlinear Science and Numerical Simulation,* **17 (2012) 4125–4136**.

[34]: ***M. Dehghan, J. Manafian, A. Saadatmandi,*** **Application of semi-analytical methods for solving the Rosenau-Hyman equation arising in the pattern formation in liquid drops,** *International Journal of Numerical Methods for Heat & Fluid Flow*, **22(6) (2012) 777–790**.

[35]: ***A. Saadatmandi, M. R. Azizi*****, Chebyshev finite difference method for a Two-Point Boundary Value Problems with Applications to Chemical Reactor Theory**, *Iranian Journal of Mathematical Chemistry***, 3(1) (2012) 1-7.**

[36]: ***S. Yeganeh, Y. Ordokhani, A. Saadatmandi,*** **A Sinc-Collocation Method for Second-Order Boundary Value Problems of Nonlinear Integro-Differential Equation,** *Journal of Information and Computing Science***, 7(2) (2012) 151-160.**

[37]: ***A. Saadatmandi,*** **Numerical study of Second Painlev´e equation,** *Communications in Numerical Analysis***, Volume 2012, Year 2012 Article ID cna-00157, 16 pages.**

[38]: ***D. Baleanu, A. Saadatmandi, A. Kadem, M. Dehghan*****, The fractional linear systems of equations within an operational approach,** *Journal of Computational and Nonlinear Dynamics***, 8 (2) (2013) , art. no. 021011.**

[39]: ***S. Yeganeh, A. Saadatmandi , F. Soltanian, M. Dehghan,*** **The numerical solution of differential-algebraic equations by sinc-collocation method,** *Computational & Applied Mathematics***, 32 (2013) 343-354.**

[40]: **E.** ***Babolian, A. Eftekhari, A. Saadatmandi*****, A Sinc–Galerkin approximate solution of the reaction–diffusion process in an immobilized biocatalyst pellet,** *MATCH Communications in Mathematical and in*

Computer Chemistry, ***71 (3) (2014) 681-697.***

[41]: *A. Saadatmandi*, Bernstein operational matrix of fractional derivatives and its applications, *Applied Mathematical Modelling*, ***38 (2014) 1365-1372.***

[42]: *E. Babolian, A. Eftekhari, A. Saadatmandi,* A Sinc–Galerkin technique for the numerical solution of a class of singular boundary value problems, *Computational & Applied Mathematics*, ***34 (2015) 45-63*.**

[43]: *A. Saadatmandi, F. Mashhadi-Fini,* A pseudospectral method for nonlinear Duffing equation involving both integral and non-integral forcing terms , *Mathematical Methods in the Applied Sciences*, **38 (2015) 1265-1272.**

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[47]: *A. Saadatmandi, Z. Sanatkar,* An approximate solution of the MHD flows of UCM fluids over porous stretching sheets by rational Legendre collocation method, *International Journal of Numerical Methods for Heat and Fluid Flow*, **26 (2016) 2218-2234.**

[48]: *A. Saadatmandi, A. Asadi, A. Eftekhari,* Collocation method using quintic B-spline and Sinc functions for solving a model of squeezing flow between two infinite plates, *International Journal of Computer Mathematics,* **93 (2016) 1921-1936.**

[49]: *A. Saadatmandi, Z. Akbari,* Transformed Hermite functions on a finite interval and their applications to a class of singular boundary value problems, *Computational & Applied Mathematics*, **36 (2017) 1085-1098.**

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[51]: *A. Saadatmandi, S. Yeganeh,* New approach for the Duffing equation involving both integral and non-integral forcing terms, *UPB Scientific Bulletin, Series A*, **79 (2017) 43-52.**

[52]: *A. Saadatmandi, Z. Sanatkar, S.P. Toufighi,* Computational methods for solving the steady flow of a third grade fluid in a porous half space, *Applied Mathematics and Computation*, **298 (2017) 133-140.**

[53]: *M. A. Darani, A. Saadatmandi,* The operational matrix of fractional derivative of the fractional-order Chebyshev functions and its applications, *Computational Methods for Differential Equations,* **5 (2017) 67-87**.

[54]: *A. Saadatmandi,* Hartley series direct method for variational problems, *Mathematics Interdisciplinary Research,* **2 (2017) 23-31.**

[55]: *A. Saadatmandi, S. Fayyaz,*, Numerical Study of Oxygen and Carbon Substrate Concentrations in Excess Sludge Production Using Sinc-Collocation Method, *MATCH Communications in Mathematical and in Computer Chemistry,* **80 (2018) 355-368.**

[56]: *A. Saadatmandi, A. Khani, M.R . Azizi,*, A sinc-Gauss-Jacobi collocation method for solving Volterra's population growth model with fractional order, *Tbilisi Mathematical Journal,* 11 (2018) 123-137.**

[57]: *A. Saadatmandi, Z. Sanatkar,* Collocation method based on rational Legendre functions for solving the magneto-hydrodynamic flow over a nonlinear stretching sheet, *Applied Mathematics and Computation*, 323 (2018) 193-203.

[58]: *A. Saadatmandi, M. Bisheh-Niasar, M. Akrami-Arani,* A new family of high-order difference schemes for the solution of second order boundary value problems , *Iranian Journal of Mathematical Chemistry,* 9 (2018) 187-199.

[59]: *A. Saadatmandi, S. Fayyaz,*, Chebyshev finite difference method for solving a mathematical model arising in wastewater treatment plants,, *Computational Methods for Differential Equations*, 6 (2018) 448-455.

[60]: *A. Saadatmandi, S. Shateri,*, Sinc-collocation method for solving sodium alginate (SA) non-Newtonian nanofluid flow between two vertical flat plates, *Journal of the Brazilian Society of Mechanical Sciences and Engineering,* 41 (2019) 1-12.

[61]: *A. Saadatmandi, Azam Ghasemi-Nasrabady, Ali Eftekhari,* Numerical study of singular fractional Lane–Emden type equations arising in astrophysics, *Journal of Astrophysics and Astronomy,* 40 (2019) 1-12.

[62]: *M. Pourbabaee, A. Saadatmandi*, A novel Legendre operational matrix for distributed order fractional differential equations, *Applied Mathematics and Computation,* 361 (2019) 215-231.

[63]: *M. Bisheh-Niasar, A. Saadatmandi,* Some Novel Newton-Type Methods for Solving Nonlinear Equations, *Boletim da Sociedade Paranaense de Matemática*, 38 (2020) 111-123.

[64]: *A. Saadatmandi, Samiye Akhlaghi,* Using hybrid of block-pulse functions and Bernoulli polynomials to solve fractional Fredholm-Volterra integro-differential equations , *Sains Malaysiana,* 49 (2020) 953-962.

[65]: *N. Moshtaghi, A. Saadatmandi*, Numerical solution for diffusion equations with distributed-order in time based on Sinc-Legendre collocation method, *Applied and Computational Mathematics,* 19 (2020) 317-355.

[66]: *A. Saadatmandi*, *A. Khani, M. R. Azizi* Numerical calculation of fractional derivatives for the Sinc functions via Legendre polynomials, *Mathematics Interdisciplinary Research,* 5 (2020) 71-86.

[67]: *M. Pourbabaee, A. Saadatmandi*, Collocation method based on Chebyshev polynomials for solving distributed order fractional differential equations, *Computational Methods for Differential Equations,* 9 (2020) 853-873.

[68]: *A. Eftekhari*, *A. Saadatmandi,* DE Sinc-collocation method for solving a class of second-order nonlinear BVPs, *Mathematics Interdisciplinary Research,* 6 (2021) 11-22.

[69]: *N. Moshtaghi, A. Saadatmandi,* Polynomial–Sinc collocation method combined with the Legendre–Gauss quadrature rule for numerical solution of distributed order fractional differential equations, *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas,* 115 (2021) 1-23.

[70]: *N. Moshtaghi, A. Saadatmandi,* Numerical solution of time fractional cable equation via the Sinc-Bernoulli collocation method, *Journal of Applied and Computational Mechanics,* 7 (2021) 1916-1924.

[71]: ***M. Pourbabaee, A. Saadatmandi*****, The construction of a new operational matrix of the distributed-order fractional derivative using Chebyshev polynomials and its applications,** *International Journal of Computer Mathematics,* **98 (2021) 2310–2329.**

[72]: ***M. Pourbabaee, A. Saadatmandi*****, A new operational matrix based on Müntz–Legendre polynomials for solving distributed order fractional differential equations,** *Mathematics and Computers in Simulation,* **194 (2022) 210–235.**

[73]: ***S. Alikhani, M. Pourbabaee, M Ghorbani, A. Saadatmandi*****, In Memory of Professor Ali Reza Ashrafi (1964-2023): A Matchless Role Model in Mathematical Chemistry in Iran ,** *Iranian Journal of Mathematical Chemistry,* **14 (2023) 1–6.**

[74]: ***M. Pourbabaee, A. Saadatmandi*****, New operational matrix of Riemann-Liouville fractional derivative of orthonormal Bernoulli polynomials for the numerical solution of some distributed-order time-fractional partial differential equations,** *Journal of Applied Analysis and Computation,* **13 (2023) 3352-3373.**

[75]: ***A. Ghasemi, A. Saadatmandi*****, A new Bernstein-reproducing kernel method for solving forced Duffing equations with integral boundary conditions,** *Computational Methods for Differential Equations ,* **12 (2024) 329-337.**

[76]: ***A. Ghasemi, A. Saadatmandi*****, A Bernoulli-reproducing kernel method for a class of nonlinear singular boundary value problems,** *Journal of Applied Analysis and Computation,* **14 (2024) 3260-3281.**

[77]: ***F. Zakipour, A. Saadatmandi*****, A new Bernoulli–Picard iteration method for nonlinear initial value problems,** *Vietnam Journal of Mathematics,* **(2025) In press.**

[78]: ***F. Zakipour, A. Saadatmandi*****, A novel fractional Bernoulli-Picard iteration method to solve fractional differential equations,** *Journal of Mathematical Modeling,* **13 (2025) 139-152.**

[79]: ***F. Ghandi, M. Davtalab-Olyaie, M. Asgharian, M. A. Begen, A. Saadatmandi*****, Pareto-optimal peer evaluation in context-dependent DEA,** *Operational Research,* **25 (2025) :4.**

[80]: ***M. Pourbabaee, A. Saadatmandi*****, A numerical schemes based on Vieta-Lucas polynomials for evaluating the approximate solution of some types of fractional optimal control problems,** *Iranian Journal of Science and Technology, Transactions of Electrical Engineering,* **49 (2025) 873-895.**

Conference Papers

[1]: ***A . Saadatmandi*** **, M. Dehghan,** Bounded solutions of a partial difference equation, *30th Iranian International Conference on Mathematics, Ardabil, Iran, 1999.*

[2]: ***A . Saadatmandi*** **, S.Yeganeh,** The sinc-collocation method for solving a problem arising in Chemical reactor theory, *43th Annual Iranian Mathematics Conference, University of Tabriz, Tabriz, Iran, 2012.*

[3]: N. Nafar, ***A. Saadatmandi*****,** Projected differential transform method for solving Burgers' equation, *4th Conference on Mathematical Analysis and its Applications, Khansar,Iran, 2013.*

[4]: E. Babolian, A. Eftekhari, *A. Saadatmandi*, A sinc-collocation method for solving a nonlinear system of second order boundary value problems, *44th Annual Iranian Mathematics Conference, Mashhad, Iran , 2013.*

[5]: *A. Saadatmandi*, Computational method for variational problems, *The Second Conference on Computational Group Theory, Computational Number Theory and Applications, Kashan, Iran, 2015.*

[6]: A. Eftekhari, *A. Saadatmandi*, Application of Double Exponential sinc-collocation method for solving multi-point boundary value problem for optimal bridge design, *International Conference on Architecture and Mathematics, Kashan, Iran, 2017.*

[7]: A. Eftekhari, ***A. Saadatmandi***, DE sinc collocation method for solving the Bagley-Torvik equation with variable coefficients , *48th Annual Iranian Mathematics Conference, Hamedan, Iran , 2017.*

[**8]: *M. Pourbabaee*, *A. Saadatmandi***, Numerical solution of a singular boundary value problem arising in the theory of shallow membrane caps via Sinc-collocation method, , *49th Annual Iranian Mathematics Conference, Tehran, Iran , 2018.*

[**9]: *N. Moshtaghi*, *A. Saadatmandi***, Sinc-collocation method for approximate solution of the model of beam-type nano-scale electrostatic actuators, *49th Annual Iranian Mathematics Conference, Tehran, Iran , 2018.*

[**10]: *M. Pourbabaee*, *A. Saadatmandi***, Numerical solution of fractional pantograph differential equation using Chebyshev polynomials , *۵۰th Annual Iranian Mathematics Conference, Shiraz, Iran , 2020*. (**Farsi**)

[**11]: *M. Pourbabaee*, *A. Saadatmandi***, Collocation method based on Legendre polynomials for solving distributed order fractional differential equations, *۵1st Annual Iranian Mathematics Conference, Kashan, Iran , 2021*. (**Farsi**)

[**12]: *M. Pourbabaee*, *A. Saadatmandi***, Numerical solution of the distributed-order diffusion-wave equations based on Legendreoperational matrix, *۵1st Annual Iranian Mathematics Conference, Kashan, Iran , 2021*. (**Farsi**)

Books

Calculus 1 (Farsi), Amirkabir University of Technology (Tafresh Branch), 2006

Introduction to Numerical Analysis (Farsi), University of Tabriz,2015

INVITED REVIEWER FOR JOURNALS

- Reviewer for international journals including

Applications and Applied Mathematic
Applied Mathematical Modelling
Applied Numerical Mathematics
Bulletin of the Iranian Mathematical Society
Communications in Numerical Analysis
Computational Methods for Differential Equations
Computers and Mathematics with Applications
International Journal of Computer Mathematics
International Journal of Control
International Journal of Nonlinear Science
Inverse Problems in Science & Engineering
Iranian Journal of Mathematical Chemistry
Iranian Journal of Numerical Analysis and Optimization
Iranian Journal of Science and Technology
Journal of Computational and Applied Mathematics
Mathematical Communications
Mathematical Methods in the Applied Sciences
Numerical Algorithms
Scientia Iranica, ….

GRADUATE AND UNDERGRADUATE COURSES

- **Numerical Analysis I, II, Numerical Computing, Calculus I, II, Ordinary Differential Equations,**
- **Linear Algebra, Mathematics Engineering, Advanced Numerical Analysis, Numerical Linear Algebra**
- **Integral Equations, Numerical Solutions of PDE, Numerical Solutions of ODE, Approximation Theory,**
- **Fractional calculus**