Gholamreza Hojjati

Curriculum Vitae

Professor of Applied Mathematics-Numerical Analysis at the University of Tabriz

Personal Details

Gender	Male
Date of birth	15th August, 1973
Place of birth	Maragheh, Iran
Present Citizenship	Iranian

Education

2000–2004 **PhD in Applied Mathematics**, *University of Tabriz*, Tabriz, *GPA – 19.37*.
First rank holder among Applied Mathematics PhD students starting University of Tabriz together

1995–1997 **Masters of Applied Mathematics**, *Tarbiat Modares University (T.M.U)*, Tehran, *GPA – 19.00*.
First rank holder in the entrance examination

1991–1995 **Bachelor of Mathematics Education**, *University of Tabriz*, Tabriz, *GPA – 18.14*.
First rank holder among Mathematics BSc students starting University of Tabriz together

Masters Thesis

Title	*Matrix free method for the solution of stiff systems of ODEs*
Supervisor	Prof. S.M. Hosseini

PhD Thesis

Title	*The modification of advanced numerical methods for stiff IVPs*
Supervisor	Prof. M.Y. Rahimi

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Teaching Experience

2000–Present Advanced Numerical Analysis, Numerical solution of ODEs, Differential Algebraic Equation, Numerical Computations, Numerical Linear Algebra, Math. 1, Math. 2 (Multivariable Calculus) and Differential Equations at the University of Tabriz

Present Research/Professional Speciality

- Numerical methods for ordinary differential equations
- Efficient solution of stiff differential equations
- Numerical methods for Volterra integral equations
- Numerical methods for Volterra integro–differential equations
- Oscillatory Hamiltonian problems
- Numerical methods for differential-algebraic equations (Reading)

Editorial Positions

- Member of editorial board, Iranian Journal of Numerical Analysis and Optimization
- Member of editorial board, Computational Methods for Differential Equations
- Member of editorial board, Journal of Mathematical Modeling
- Member of editorial board, Journal of Advanced Mathematical Modeling

Referee Activities

- SIAM Journal on Numerical Analysis
- Applied Numerical Mathematics, (Elsevier)
- Journal of Computaional and Applied Mathematics, (Elsevier)
- CALCOLO, (Springer)
- Numerical Algorithms, (Springer)
- Applied Mathematics and Computations, (Elsevier)
- Bulletin of the Iranian Mathematical Society, (Springer)
- Advances in Difference Equations, (Springer)
- Computaional and Applied Mathematics, (Springer)
- ...

Visiting Positions

2004 Research opportunity under the supervision of Professor John C. Butcher, The University of Auckland, Auckland, New Zealand.

2005 Research opportunity, The Abdus Salam International Center of Theoretical Physics, ICTP, Trieste, Italy.

Workshops & Conferences

2021 Conference on the Numerical Solution of Differential and Differential-Algebraic Equations (NUMDIFF-16), Sep. 2021, Halle, Germany.

2019 International Conference on Recent Advances in Applied Mathematics, ICRAAM, Feb. 2019, Lahore, Pakistan.

2019 8th International eurasian conference on mathematical sciences and applications, IECMSA, Aug. 2019, Baku, Azerbaijan.

2018 Conference on the Numerical Solution of Differential and Differential-Algebraic Equations (NUMDIFF-15), Sep. 2018, Halle, Germany.

2017 International Conference on Computational Methods and Function Theory, July 2017, Lublin, Poland.

2016 International Conference on Mathematical Methods and Models in Biosciences, June 2016, Blagoevgrad, Bulgaria.

2015 International conference on scientific computation and differential equations (SciCADE 2015), Sep. 2015, University of Potsdam, Potsdam, Germany.

2013 International conference on scientific computation and differential equations (SciCADE 2013), Sep. 2013, University of Valladolid, Spain.

2011 International conference on scientific computation and differential equations (SciCADE 2011), Aug. 2011, University of Toronto, Canada.

2010 Conference in Numerical Analysis (NumAn 2010), Sep. 2010, Chania, Crete, Greece.

2009 9th International Conference on Numerical Analysis and Applied Mathematics, Sep. 2009, (ICNAAM 2009), Sep. 2009, Rethymno, Crete, Greece.

2008 5th European congress of mathematics, July 2008, Amsterdam, The Netherlands.

2007 International Conference on Dynamical Methods and Mathematical Modelling, Sep. 2007, Valladolid, Spain.

Publications

Journal articles:

1. M. Sharifi, A. Abdi, **G. Hojjati**, On the construction of diagonally implicit two–step peer methods with RK stability, *Appl. Numer. Math.* 198 (2024) 138–147.
2. M. Eghbaljoo, **G. Hojjati**, A. Abdi, Adaptive second derivative multistep methods for solving stiff chemical problems, *J. Math. Chem.* to appear.
3. A. Moradi, A. Abdi, **G. Hojjati**, Strong stability preserving second derivative general linear methods based on Taylor series conditions for discontinuous Galerkin discretizations, *J. Sci. Comput.* 98 (2024) 20:1–21.
4. A. Moradi, A. Abdi, **G. Hojjati**, RK-stable second derivative multistage methods with strong stability preserving based on Taylor series conditions, *Comp. Appl. Math.* 42 (2023) 193–220.
5. R. Akbari, **G. Hojjati**, A. Abdi, Algebraic stability and irreducibility of second derivative methods, *Appl. Numer. Math.* 191 (2023) 45–54.
6. P. Khakzad, A. Moradi, **G. Hojjati**, M. Mehdizadeh Khalsaraei, A. Shokri, Strong stability preserving integrating factor general linear methods, *Comp. Appl. Math.* 42 (2023) 214–236.

7. A. Abdi, **G. Hojjati**, Z. Jackiewicz, H. Podhaisky, On the implementation of explicit two-step peer methods with Runge–Kutta stability, *Appl. Numer. Math.* 186 (2023) 213–227.
8. M. Sharifi, A. Abdi, M. Braś, **G. Hojjati**, High order oecond derivative diagonally implicit multistage integration methods for ODEs, *Math. Model. Anal.* 28 (2023) 53–70.
9. A. Moradi, A. Abdi, **G. Hojjati**, High order explicit second derivative methods with strong stability properties based on Taylor series conditions,*ANZIAM J.* 64 (2022) 264–291 .
10. S. Fazeli, **G. Hojjati**, A class of two-step collocation methods for Volterra integro-differential equations,
11. A. Moradi, A. Abdi, **G. Hojjati**, Implicit–explicit second derivative general linear methods with strong stability preserving explicit part, *Appl. Numer. Math.* 181 (2022) 23–45.
12. P. Ramazani, A. Abdi, **G. Hojjati**, A. Moradi, Explicit Nordsieck second derivative general linear methods for ODEs, *ANZIAM J.* 64 (2022) 69–88 .
13. A. Moradi, A. Abdi, **G. Hojjati**, Strong stability preserving implicit and implicit–explicit second derivative general linear methods with RK stability, *Comp. Appl. Math.* 41 (2022) 135: 1–23.
14. A. Abdi, **G. Hojjati**, L. Taheri Koltape, Extended SDBDF-type methods based on linear barycentric rational interpolants for ODEs, *Bull. Iranian Math. Soc.* Accepted.
15. T. Majidi, A. Abdi, **G. Hojjati**, Generalized second derivative linear multistep methods for ordinary differential equations, *Numer. Algor.* 91 (2022) 227–250.
16. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit second derivative general linear methods, *Numer. Algor.* 90 (2022) 833–850.
17. **G. Hojjati**, L. Taheri Koltape, On the stability functions of second derivative implicit advanced-step point methods, *J. Math. Model.* 10 (2022) 203–212.
18. B. Talebi, A. Abdi, **G. Hojjati**, Composite symmetric second derivative general linear methods for Hamiltonian systems, *Calcolo* 59 (2022) 17:1–24.
19. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit general linear methods, *Numer. Algor.* 89 (2022) 1075–1093.
20. A. Jalilian, A. Abdi, **G. Hojjati**, Variable stepsize SDIMSIMs for ordinary differential equations, *Appl. Numer. Math.* 168 (2021) 115–126.
21. A.Y.J. Almasoodi, A. Abdi, **G. Hojjati**, A GLMs-based difference-quadrature scheme for Volterra integro-differential equations, *Appl. Numer. Math.* 163 (2021) 292–302.
22. Z. Esmaeelzadeh, A. Abdi, **G. Hojjati**, EBDF-type methods based on the linear barycentric rational interpolants for stiff IVPs, *J. Appl. Math. Comp.* 66 (2021) 835–851.
23. A. Abdi, **G. Hojjati**, Second derivative backward differentiation formulae for ODEs based on barycentric rational interpolants, *Numer. Algor.* 87 (2021) 1577–1591.
24. A. Abdi, **G. Hojjati**, M. Sharifi, Implicit-explicit second derivative diagonally implicit multistage integration methods, *Comp. Appl. Math.* 39 (2020) 228: 1–15.
25. S. Fazeli, **G. Hojjati**, Second derivative two-step collocation methods for ordinary differential equations, *Appl. Numer. Math.* 156 (2020) 514–527.
26. A. Abdi, **G. Hojjati**, Projection of Second Derivative Methods for Ordinary Differential Equations with Invariants, *Bull. Iranian Math. Soc.* 46 (2020) 99–113.

27. H. Mahdi, **G. Hojjati**, A. Abdi, Explicit general linear methods with a large stability region for Volterra integro-differential equations, *Math. Model. Anal.* 24 (2019) 478–493.

28. A. Abdi, **G. Hojjati**, Z. Jackiewicz, H. Mahdi, A new code for Volterra integral equations based on natural Runge–Kutta methods, *Appl. Numer. Math.* 143 (2019) 35–50.

29. H. Mahdi, **G. Hojjati**, A. Abdi, On the numerical stability of the general linear methods for Volterra integro-differential equations, *Appl. Numer. Math.* 142 (2019) 139–150.

30. H. Mahdi, A. Abdi, **G. Hojjati**, Efficient general linear methods for a class of Volterra integro–differential equations, *Appl. Numer. Math.* 127 (2018) 95–109.

31. M. Hosseini Nasab, A. Abdi, **G. Hojjati**, Symmetric second derivative integration methods, *J. Comput. Appl. Math.* 330 (2018) 618–629.

32. N. Barghi Oskouie, **G. Hojjati**, A. Abdi, Efficient second derivative methods with extended stability regions for non-stiff IVPs, *Comp. Appl. Math.* 37 (2018) 2001–2016.

33. N. Yousefzadeh, **G. Hojjati**, A. Abdi, Construction of implicit–explicit second derivative BDF methods, *Bull. Iranian Math. Soc.* 44 (2018) 991–1006.

34. N. Barghi Oskouie, A. Abdi, **G. Hojjati**, Some eficient Nordsieck integration methods for IVPs, *Iranian J. Numer. Anal. Opt.* 8 (2018) 111-128.

35. A. Movahedinejad, **G. Hojjati**, A. Abdi, Construction of Nordsieck second derivative general linear methods with inherent quadratic stability, *Math. Model. Anal.* 22 (2017) 60–77.

36. M. Hosseini Nasab, **G. Hojjati**, A. Abdi, G-symplectic second derivative general linear methods for Hamiltonian problems, *J. Comput. Appl. Math.* 313 (2017) 486–498.

37. M. Hosseini Nasab, **G. Hojjati**, A. Abdi, A Class of Methods with Optimal Stability Properties for the Numerical Solution of IVPs: Construction and Implementation, *International Journal of Computational Methods* 14 (2017) 1–17.

38. A. Movahedinejad, A. Abdi, **G. Hojjati**, A hybrid method with optimal stability properties for the numerical solution of stiff differential systems, *Computational Methods for Differential Equations* 4 (2016) 217–229.

39. A. Movahedinejad, **G. Hojjati**, A. Abdi, Second derivative general linear methods with inherent Runge-Kutta stability, *Numer. Algor.* 73 (2016) 371–389.

40. A. Abdi, F. Fazeli, **G. Hojjati**, Construction of efficient general linear methods for stiff Volterra integral equations, J. Comput. Appl. Math. 292 (2016) 417–429.

41. A. Abdi, **G. Hojjati**, Implementation of Nordsieck second derivative methods for stiff ODEs, *Appl. Numer. Math.* 94 (2015) 241–253.

42. **G. Hojjati**, A class of parallel methods with superfuture points technique for the numerical solution of stiff systems, *J. Modern Meth. Numer. Math.* 6 (2015) 57–63.

43. S. Fazeli, **G. Hojjati**, Numerical solution of Volterra integro-differential equations by superimplicit multistep collocation methods, *Numer. Algor.* 68 (2015) 741–768.

44. S. Fazeli, **G. Hojjati**, S. Shahmorad, Multistep collocation and iterated multistep collocation methods for solving two-dimensional Volterra integral equations, *J. Modern Meth. Numer. Math.* 6 (2015) 1–21.

45. A. Abdi, **G. Hojjati**, High order second derivative methods with Runge–Kutta stability for the numerical solution of stiff ODEs, *Iranian J. Numer. Anal. Opt.* 5 (2015) 1–10.

46. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Perturbed second derivative multistep methods, *J. Numer. Math.* 23 (2015) 235–245.

47. S. Ashrafi, M. Alineia, H. Kheiri, **G. Hojjati**, Spectral Collocation Method for the Numerical Solution of the Gardner and Huxley Equations, *Int. J. Nonlinear Science* 18 (2014) 71–77.

48. **G. Hojjati**, A. Abdi, F. Mirzaee, S. Bimesl, Numerical solution of stiff systems of differential equations arising from chemical reactions, *Iranian J. Numer. Anal. Opt.* 4 (2014) 25–39.

49. A. Abdi, M. Braś, **G. Hojjati**, On the construction of second derivative diagonally implicit multistage integration methods for ODEs, *Appl. Numer. Math.* 76 (2014) 1–18.

50. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Sequential second derivative general linear methods for stiff systems, *Bull. Iranian Math. Soc.* 40 (2014) 83–100.

51. B. Shiri, S. Shahmorad, **G. Hojjati**, Convergence analysis of piecewise continuous collocation methods for higher index integral algebraic equations of the hessenberg type, *Int. J. Appl. Math. Comput. Sci.* 23 (2013) 341–355.

52. S. Fazeli, **G. Hojjati**, H. Kheiri, A piecewise approximation for linear two dimensional Volterra integral equation by Chebyshev polynomials, *Int. J. Nonlinear Science* 16 (2013) 255–261.

53. **G. Hojjati**, H. Kheiri, S. Irandoust, Solving painleve equation of type 1 using homotopy Padè method, *Adv. studi. Contem. Math.* 23 (2013) 253–259.

54. S. Fazeli, **G. Hojjati**, S. Shahmorad, Multistep Hermite collocation methods for solving Volterra Integral Equations, *Numer. Algor.* 60 (2012) 27–50.

55. M. Mehdizadeh, N. Nasehi, **G. Hojjati**, A class of second derivative multistep methods for stiff systems, *Acta Universitatis Apulensis* 30 (2012) 171–188.

56. S. Fazeli, **G. Hojjati**, S. Shahmorad, Super implicit multistep collocation methods for nonlinear Volterra integral equations, *Math. Comput. Model.* 55 (2012) 590–607.

57. A. K. Ezzeddine, **G. Hojjati**, Hybrid extended backward differentiation formulas for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.

58. A. Abdi, **G. Hojjati**, Maximal order for second derivative general linear methods with Runge-Kutta stability, *Appl. Numer. Math.* 61 (2011) 1046–1058.

59. A. K. Ezzeddine, **G. Hojjati**, Third derivative multistep methods for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.

60. M. Falati, **G. Hojjati**, Integration of chemical stiff ODEs using exponential propagation method, *J. Math. Chemistry* 49 (2011) 2210–2230.

61. A. Abdi, **G. Hojjati**, An extension of general linear methods, *Numer. Algor.* 57 (2011) 149–167.

62. A. Shokri, M. Rahimi, S. Shahmorad, **G. Hojjati**, A new two-step hybrid Obrechkoff method for the numerical integration of second-order IVPs, *J. Comput. Appl. Math.* 235 (2011) 1706–1712.

63. S. Fazeli, H. Kheiri, **G. Hojjati**, Homotopy analysis and homotopy Pade methods for mixed Volterra-Fredholm integral equations, *Adv. studi. Contem. Math.* 20 (2010) 547–556.

64. M. Mehdizadeh Khalsarayi, M. Rahimi, **G. Hojjati**, The new class of super-implicit second derivative multistep methods for stiff systems, *J. Appl. Func. Anal.* 4 (2009) 492–500.
65. **G. Hojjati**, M. Rahimi, S. M. Hosseni, New second derivative multistep methods for stiff systems, *Appl. Math. Model.* 30 (2006) 466–476.
66. J. Butcher, **G. Hojjati**, Second derivative methods with RK stability, *Numer. Algor.* 40 (2005) 415–429.
67. **G. Hojjati**, M. Rahimi, S. M. Hosseni, A-EBDF: An adaptive method for numerical solution of stiff systems of ODEs, *Math. Comput. Simul.* 66 (2004) 33–41.
68. S. M. Hosseini, **G. Hojjati**, Matrix free MEBDF method for the solution of stiff systems of ODEs, *Math. Comput. Model.* 29 (1999) 67–77.

Books:

1. G. Hojjati, H. Kheiri, A. Rahimi, S. Shahmorad, *Approximation Theory*, University of Maragheh Press, 2010 (Translation).
2. H. Kheiri, G. Hojjati, *Numerical Solution of Ordinary Differential Equations*, University of Tabriz Press, 2014 (Translation).
3. G. Hojjati, A. Abdi, *Numerical Methods for Ordinary Differential Equations*, University of Tabriz Press, 2021.

Visitors

2017 *Dr. Leila Ranjbari*, Postdoctoral researcher, 2017-2018.
2020 *Dr. Afsaneh Moradi*, Postdoctoral researcher, 2020-2022.
2023 *Dr. Pari Khakzad*, Postdoctoral researcher, 2023-2024.

PhD Students

2008-2012 **Somayyeh Fazeli**, *Title of thesis:* Multistep collocation methods for numerical solution of Volterra integral equations
2008-2012 **Ali Abdi**, *Title of thesis:* Extention on generel linear methods
2008-2013 **Babak Shiri**, *Title of thesis:* Numerical solution of a class of integral-algebrai
2010-2013 **Ali Karam Ezzeddine**, *Title of thesis:* Extension of stability region of numerical methods for solving IVPs
2013-2016 **Akram Movahedinejad**, *Title of thesis:* Multivalue–multistage methods with inherent stability property
2013-2017 **Masoumeh Hosseini Nasab**, *Title of thesis:* Efficient numerical methods preserving geometric structure for solving ordinary differential equations

2012-2017 **Nazila Yousefzadeh**, *Title of thesis:* Implicit-Explicit second derivative linear methods for the numerical solution of initial value problems

2013-2018 **Nasrin Barghi Oskouie**, *Title of thesis:* Construction and Implementation of SGLMs with the maximum area of stability region

2016-2019 **Hassan Mahdi**, *Title of thesis:* General linear methods for Volterra integro-differential equations

2017-2021 **Arash Jalilian**, *Title of thesis:* Variable stepsize second derivative general linear methods for ordinary differential equations

2018-2021 **Abdullah Almasoodi**, *Title of thesis:* Multi-stage Multi-value methods for solving Volterra integro-differential equations

2019-2022 **Paria Ramazani**, *Title of thesis:* On the construction of explicit Nordsieck second derivative general linear methods with inherent stability property

2018-2022 **Tahere Majidi**, *Title of thesis:* Generalized second derivative linear multistep methods

2017-2023 **Rana Akbari**, *Title of thesis:* Irreducible second derivative general linear methods

Computer skills

Intermediate Pascal programming, Microsoft Office, Microsoft Windows

Advanced Matlab, Maple, LaTeX, FTeX, XeLaTeX, XePersian

Languages

Turkish **Native**

Persian **Native**

English **Advanced**

References

These persons are familiar with my professional qualifications and my character:

- **Prof. J.C. Butcher**, Emeritus professor of Mathematics, Department of Mathematics, The University of Auckland, Auckland, New Zealand.
  E-mail: butcher@math.auckland.ac.nz
- **Prof. Z. Jackiewicz**, Professor of Applied Mathematics, School of Mathematical & Statistical Sciences, Arizona State University, Tempe, United States of America.
  Email: jackiewicz@asu.edu
- **Prof. S.M. Hosseini**, Professor of Applied Mathematics, Faculty of Mathematics, University of Tarbiat Modares, Tehran, Iran.
  Email: hossei_m@modares.ac.ir
- **Prof. M.Y. Rahimi**, Professor of Applied Mathematics, Faculty of Mathematical Sciences, University of Tarbriz, Tabriz, Iran.
  Email: ahimi@tabrizu.ac.ir