



# 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 Iranian  
Citizenship

### **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

*Faculty of Mathematical Sciences, University of Tabriz, 29 Bahman St., Tabriz, Iran*

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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

## Referee Activities

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

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## 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.

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## Publications

### **Journal articles:**

1. A. Moradi, A. Abdi, **G. Hojjati**, High order explicit second derivative methods with strong stability properties based on Taylor series conditions, *ANZIAM J.* Accepted.
2. S. Fazeli, **G. Hojjati**, A class of two-step collocation methods for Volterra integro-differential equations, *Appl. Numer. Math.* 181 (2022) 59–75.
3. 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.
4. P. Ramazani, A. Abdi, **G. Hojjati**, A. Moradi, Explicit Nordsieck second derivative general linear methods for ODEs, *ANZIAM J.* 64 (2022) 69–88 .
5. 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.
6. A. Abdi, **G. Hojjati**, L. Taheri Kolape, Extended SDBDF-type methods based on linear barycen-

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- tric rational interpolants for ODEs, *Bull. Iranian Math. Soc.* Accepted.
7. T. Majidi, A. Abdi, **G. Hojjati**, Generalized second derivative linear multistep methods for ordinary differential equations, *Numer. Algor.* 91 (2022) 227–250.
  8. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit second derivative general linear methods, *Numer. Algor.* 90 (2022) 833–850.
  9. **G. Hojjati**, L. Taheri Koltape, On the stability functions of second derivative implicit advanced-step point methods, *J. Math. Model.* 10 (2022) 203–212.
  10. B. Talebi, A. Abdi, **G. Hojjati**, Composite symmetric second derivative general linear methods for Hamiltonian systems, *Calcolo* 59 (2022) 17:1–24.
  11. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit general linear methods, *Numer. Algor.* 89 (2022) 1075–1093.
  12. A. Jalilian, A. Abdi, **G. Hojjati**, Variable stepsize SDIMSIMs for ordinary differential equations, *Appl. Numer. Math.* 168 (2021) 115–126.
  13. 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.
  14. 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.
  15. A. Abdi, **G. Hojjati**, Second derivative backward differentiation formulae for ODEs based on barycentric rational interpolants, *Numer. Algor.* 87 (2021) 1577–1591.
  16. A. Abdi, **G. Hojjati**, M. Sharifi, Implicit-explicit second derivative diagonally implicit multistage integration methods, *Comp. Appl. Math.* 39 (2020) 228: 1–15.
  17. S. Fazeli, **G. Hojjati**, Second derivative two-step collocation methods for ordinary differential equations, *Appl. Numer. Math.* 156 (2020) 514–527.
  18. A. Abdi, **G. Hojjati**, Projection of Second Derivative Methods for Ordinary Differential Equations with Invariants, *Bull. Iranian Math. Soc.* 46 (2020) 99–113.
  19. 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.
  20. 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.
  21. 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.
  22. 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.
  23. M. Hosseini Nasab, A. Abdi, **G. Hojjati**, Symmetric second derivative integration methods, *J. Comput. Appl. Math.* 330 (2018) 618–629.
  24. 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.
  25. N. Yousefzadeh, **G. Hojjati**, A. Abdi, Construction of implicit–explicit second derivative BDF

- methods, *Bull. Iranian Math. Soc.* 44 (2018) 991–1006.
26. N. Barghi Oskouie, A. Abdi, **G. Hojjati**, Some efficient Nordsieck integration methods for IVPs, *Iranian J. Numer. Anal. Opt.* 8 (2018) 111–128.
  27. 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.
  28. 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.
  29. 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.
  30. 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.
  31. A. Movahedinejad, **G. Hojjati**, A. Abdi, Second derivative general linear methods with inherent Runge–Kutta stability, *Numer. Algor.* 73 (2016) 371–389.
  32. 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.
  33. A. Abdi, **G. Hojjati**, Implementation of Nordsieck second derivative methods for stiff ODEs, *Appl. Numer. Math.* 94 (2015) 241–253.
  34. **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.
  35. S. Fazeli, **G. Hojjati**, Numerical solution of Volterra integro-differential equations by superimplicit multistep collocation methods, *Numer. Algor.* 68 (2015) 741–768.
  36. 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.
  37. 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.
  38. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Perturbed second derivative multistep methods, *J. Numer. Math.* 23 (2015) 235–245.
  39. 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.
  40. **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.
  41. A. Abdi, M. Braš, **G. Hojjati**, On the construction of second derivative diagonally implicit multistage integration methods for ODEs, *Appl. Numer. Math.* 76 (2014) 1–18.
  42. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Sequential second derivative general linear methods for stiff systems, *Bull. Iranian Math. Soc.* 40 (2014) 83–100.
  43. 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.
44. 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.
  45. **G. Hojjati**, H. Kheiri, S. Irandoust, Solving painleve equation of type 1 using homotopy Padè method, *Adv. studi. Contem. Math.* 23 (2013) 253–259.
  46. S. Fazeli, **G. Hojjati**, S. Shahmorad, Multistep Hermite collocation methods for solving Volterra Integral Equations, *Numer. Algor.* 60 (2012) 27–50.
  47. M. Mehdizadeh, N. Nasehi, **G. Hojjati**, A class of second derivative multistep methods for stiff systems, *Acta Universitatis Apulensis* 30 (2012) 171–188.
  48. S. Fazeli, **G. Hojjati**, S. Shahmorad, Super implicit multistep collocation methods for nonlinear Volterra integral equations, *Math. Comput. Model.* 55 (2012) 590–607.
  49. A. K. Ezzeddine, **G. Hojjati**, Hybrid extended backward differentiation formulas for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.
  50. A. Abdi, **G. Hojjati**, Maximal order for second derivative general linear methods with Runge-Kutta stability, *Appl. Numer. Math.* 61 (2011) 1046–1058.
  51. A. K. Ezzeddine, **G. Hojjati**, Third derivative multistep methods for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.
  52. M. Falati, **G. Hojjati**, Integration of chemical stiff ODEs using exponential propagation method, *J. Math. Chemistry* 49 (2011) 2210–2230.
  53. A. Abdi, **G. Hojjati**, An extension of general linear methods, *Numer. Algor.* 57 (2011) 149–167.
  54. 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.
  55. 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.
  56. 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.
  57. **G. Hojjati**, M. Rahimi, S. M. Hosseni, New second derivative multistep methods for stiff systems, *Appl. Math. Model.* 30 (2006) 466–476.
  58. J. Butcher, **G. Hojjati**, Second derivative methods with RK stability, *Numer. Algor.* 40 (2005) 415–429.
  59. **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.
  60. 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.

### **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-algebraic
- 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

## Computer skills

- Intermediate Pascal programming, Microsoft Office, Microsoft Windows  
Advanced Matlab, Maple, L<sup>A</sup>T<sub>E</sub>X, F<sup>T</sup>L<sup>A</sup>T<sub>E</sub>X, X<sub>E</sub>L<sup>A</sup>T<sub>E</sub>X, X<sub>E</sub>Persian

## 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 Tabriz, Tabriz, Iran.  
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