



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

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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
- Member of editorial board, Sahand Communications in Mathematical Analysis
- Member of editorial board, Canadian Transactions of Mathematical Computing

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 Computations, (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.

Publications

Journal articles:

1. M. Sharifi, A. Abdi, M. Braś, **G. Hojjati**, Second derivative two-step peer methods, *Math. Model. Anal.* 31 (2026) 369–391.
2. S. Rasi Sar, **G. Hojjati**, A. Abdi, M. Sharifi, Explicit two-derivative Runge–Kutta methods with improved linear stability properties for ODEs, *TWMS J. App. Eng. Math.* accepted.
3. P. Khakzad, **G. Hojjati**, A. Abdi, High order strong stability preserving implicit second derivative multistep methods, *Comp. Appl. Math.* 45 (2026) 1–25.
4. **G. Hojjati**, A. Abdi, D. Conte, Second derivative numerical differentiation formulas for stiff systems of ODEs, *Appl. Numer. Math.* 216 (2026) 119–127.
5. M. Sharifi, A. Abdi, M. Braś, **G. Hojjati**, On implicit second derivative two-step peer methods with RK stability for ODEs, *Appl. Numer. Math.* 220 (2026) 329–345.

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6. M. Eghbaljoo, **G. Hojjati**, A. Abdi, P. Khakzad, Explicit two-derivative Runge–Kutta methods coupled with the Richardson extrapolation, *Numer. Anal. Appl.* 18 (2025) 351–366.
7. **G. Hojjati**, S. Fazeli, A. Moradi, On overcoming Dahlquist’s second barrier for α -stable linear multistep methods, *Iran. J. Numer. Anal. Optim.* 15 (2025) 1639–1657.
8. M.F. Yoness Al-Aboud, H. Kheiri, **G. Hojjati**, S. Jawad, Optimal control and global stability of the stomach cancer treatment model in the presence of obesity and psychological scare, *J. Math. Ext.* 19 (2025), 1–32.
9. Z. Ghahremani, A. Abdi, **G. Hojjati**, Efficient numerical methods based on general linear methods for Volterra integral equations, *Appl. Numer. Math.* 216 (2025) 1–16.
10. M. Sharifi, A. Abdi, **G. Hojjati**, Construction of high order implicit-explicit SDIMSIMs for ODEs, *Comp. Appl. Math.* 44 (2025) 1–24.
11. P. Khakzad, A. Moradi, A. Abdi, **G. Hojjati**, Strong stability preserving second derivative multistep methods, *Numer. Algor.* 100 (2025) 109–132.
12. M. Sharifi, A. Abdi, M. Braś, **G. Hojjati**, A class of explicit second derivative general linear methods for non-stiff ODEs, *Math. Model. Anal.* 29 (2024) 621–640.
13. L. Taheri Koltape, **G. Hojjati**, S. Fazeli, A. Abdi, Super implicit two-step collocation methods for ordinary differential equations, *Comp. Appl. Math.* 43 (2024) 1–22.
14. M. Sharifi, A. Abdi, **G. Hojjati**, A. Mousavi, Implicit–explicit two–step peer methods with RK stability for implicit part, *Numer. Algor.* 98 (2025) 2145–2170.
15. 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.
16. M. Eghbaljoo, **G. Hojjati**, A. Abdi, Adaptive second derivative multistep methods for solving stiff chemical problems, *J. Math. Chem.* 62 (2024) 1114–1133.
17. 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.
18. 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.
19. R. Akbari, **G. Hojjati**, A. Abdi, Algebraic stability and irreducibility of second derivative methods, *Appl. Numer. Math.* 191 (2023) 45–54.
20. 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.
21. 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.
22. M. Sharifi, A. Abdi, M. Braś, **G. Hojjati**, High order second derivative diagonally implicit multistage integration methods for ODEs, *Math. Model. Anal.* 28 (2023) 53–70.
23. 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.
24. S. Fazeli, **G. Hojjati**, A class of two-step collocation methods for Volterra integro-differential

- equations, *Appl. Numer. Math.* 181 (2022) 59–75.
25. 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.
 26. P. Ramazani, A. Abdi, **G. Hojjati**, A. Moradi, Explicit Nordsieck second derivative general linear methods for ODEs, *ANZIAM J.* 64 (2022) 69–88 .
 27. 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.
 28. A. Abdi, **G. Hojjati**, L. Taheri Koltape, Extended SDBDF-type methods based on linear barycentric rational interpolants for ODEs, *Bull. Iranian Math. Soc.* 48 (2022), 3255–3268.
 29. T. Majidi, A. Abdi, **G. Hojjati**, Generalized second derivative linear multistep methods for ordinary differential equations, *Numer. Algor.* 91 (2022) 227–250.
 30. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit second derivative general linear methods, *Numer. Algor.* 90 (2022) 833–850.
 31. **G. Hojjati**, L. Taheri Koltape, On the stability functions of second derivative implicit advanced-step point methods, *J. Math. Model.* 10 (2022) 203–212.
 32. B. Talebi, A. Abdi, **G. Hojjati**, Composite symmetric second derivative general linear methods for Hamiltonian systems, *Calcolo* 59 (2022) 17:1–24.
 33. A. Abdi, **G. Hojjati**, G. Izzo, Z. Jackiewicz, Global error estimation for explicit general linear methods, *Numer. Algor.* 89 (2022) 1075–1093.
 34. A. Jalilian, A. Abdi, **G. Hojjati**, Variable stepsize SDMSMs for ordinary differential equations, *Appl. Numer. Math.* 168 (2021) 115–126.
 35. 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.
 36. Z. Esmaealzadeh, 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.
 37. A. Abdi, **G. Hojjati**, Second derivative backward differentiation formulae for ODEs based on barycentric rational interpolants, *Numer. Algor.* 87 (2021) 1577–1591.
 38. A. Abdi, **G. Hojjati**, M. Sharifi, Implicit-explicit second derivative diagonally implicit multistage integration methods, *Comp. Appl. Math.* 39 (2020) 228: 1–15.
 39. S. Fazeli, **G. Hojjati**, Second derivative two-step collocation methods for ordinary differential equations, *Appl. Numer. Math.* 156 (2020) 514–527.
 40. A. Abdi, **G. Hojjati**, Projection of Second Derivative Methods for Ordinary Differential Equations with Invariants, *Bull. Iranian Math. Soc.* 46 (2020) 99–113.
 41. 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.
 42. 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.
 43. 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.
44. 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.
 45. M. Hosseini Nasab, A. Abdi, **G. Hojjati**, Symmetric second derivative integration methods, *J. Comput. Appl. Math.* 330 (2018) 618–629.
 46. 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.
 47. N. Yousefzadeh, **G. Hojjati**, A. Abdi, Construction of implicit–explicit second derivative BDF methods, *Bull. Iranian Math. Soc.* 44 (2018) 991–1006.
 48. N. Barghi Oskouie, A. Abdi, **G. Hojjati**, Some efficient Nordsieck integration methods for IVPs, *Iranian J. Numer. Anal. Opt.* 8 (2018) 111–128.
 49. 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.
 50. 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.
 51. 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.
 52. 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.
 53. A. Movahedinejad, **G. Hojjati**, A. Abdi, Second derivative general linear methods with inherent Runge-Kutta stability, *Numer. Algor.* 73 (2016) 371–389.
 54. 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.
 55. A. Abdi, **G. Hojjati**, Implementation of Nordsieck second derivative methods for stiff ODEs, *Appl. Numer. Math.* 94 (2015) 241–253.
 56. **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.
 57. S. Fazeli, **G. Hojjati**, Numerical solution of Volterra integro-differential equations by superimplicit multistep collocation methods, *Numer. Algor.* 68 (2015) 741–768.
 58. 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.
 59. 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.
 60. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Perturbed second derivative multistep methods, *J. Numer. Math.* 23 (2015) 235–245.
 61. 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.
62. **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.
 63. 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.
 64. A. K. Ezzeddine, **G. Hojjati**, A. Abdi, Sequential second derivative general linear methods for stiff systems, *Bull. Iranian Math. Soc.* 40 (2014) 83–100.
 65. 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.
 66. 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.
 67. **G. Hojjati**, H. Kheiri, S. Irandoust, Solving painleve equation of type 1 using homotopy Padè method, *Adv. studi. Contem. Math.* 23 (2013) 253–259.
 68. S. Fazeli, **G. Hojjati**, S. Shahmorad, Multistep Hermite collocation methods for solving Volterra Integral Equations, *Numer. Algor.* 60 (2012) 27–50.
 69. M. Mehdizadeh, N. Nasehi, **G. Hojjati**, A class of second derivative multistep methods for stiff systems, *Acta Universitatis Apulensis* 30 (2012) 171–188.
 70. S. Fazeli, **G. Hojjati**, S. Shahmorad, Super implicit multistep collocation methods for nonlinear Volterra integral equations, *Math. Comput. Model.* 55 (2012) 590–607.
 71. A. K. Ezzeddine, **G. Hojjati**, Hybrid extended backward differentiation formulas for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.
 72. A. Abdi, **G. Hojjati**, Maximal order for second derivative general linear methods with Runge-Kutta stability, *Appl. Numer. Math.* 61 (2011) 1046–1058.
 73. A. K. Ezzeddine, **G. Hojjati**, Third derivative multistep methods for stiff systems, *Int. J. Nonlinear Science* 12 (2011) 196–204.
 74. M. Falati, **G. Hojjati**, Integration of chemical stiff ODEs using exponential propagation method, *J. Math. Chemistry* 49 (2011) 2210–2230.
 75. A. Abdi, **G. Hojjati**, An extension of general linear methods, *Numer. Algor.* 57 (2011) 149–167.
 76. A. Shokri, M. Rahimi, S. Shahmorad, **G. Hojjati**, A new two-step hybrid Obrechhoff method for the numerical integration of second-order IVPs, *J. Comput. Appl. Math.* 235 (2011) 1706–1712.
 77. 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.
 78. 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.
 79. **G. Hojjati**, M. Rahimi, S. M. Hosseini, New second derivative multistep methods for stiff systems, *Appl. Math. Model.* 30 (2006) 466–476.
 80. J. Butcher, **G. Hojjati**, Second derivative methods with RK stability, *Numer. Algor.* 40 (2005)

415–429.

81. **G. Hojjati**, M. Rahimi, S. M. Hosseini, A-EBDF: An adaptive method for numerical solution of stiff systems of ODEs, *Math. Comput. Simul.* 66 (2004) 33–41.
82. 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, 2023-2026.

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*: Extension on general 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*: Multivalued-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

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- 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
- 2020-2026 **Soheila Rasi Sar**, *Title of thesis:* A class of two-derivative Runge–Kutta methods for the numerical solution of ordinary differential equations

Computer skills

Intermediate Pascal programming, Microsoft Office, Microsoft Windows
Advanced Matlab, Maple, $\text{\LaTeX}$, $\text{\TeX}$, $\text{\X\LaTeX}$, $\text{\X\Persian}$

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 Tarbriz, Tabriz, Iran.
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