

Curriculum Vitae

Amir Haghighi

Department of Mathematics,
Faculty of Sciences,
Razi University, Kermanshah, Iran

Email: **a.haghighi@razi.ac.ir**
Fax: **+988334274569**
Phone: **+988334274569**

Personal

Gender: **Male**, Birth date: **15st August, 1984**
Age: **42**, Birthplace: **Kermanshah, Iran**
Present citizenship: **Iranian**

Education

1998-2001	High School Diplomas;
2001-2005	B.Sc. Applied Mathematics, Razi University, Kermanshah, Iran;
2005-2008	M.Sc in Applied Mathematics, Sharif University of Technology, Tehran, Iran;
2008- 2013	Ph.D. Student in Applied Mathematics, Tarbiat Modares University, Tehran, Iran
2013- Present	Assistant professor of applied mathematics, Razi University, Kermanshah, Iran

Distinctions:

- **2004** Member of Mathematics Olympiad team of Iran at International Mathematical Olympiad In Tehran University;
- **2005** 5th Rank in M.Sc mathematic exam in Iran;
- **2008** First Rank Student in Ph.D. Entry exam of Applied Mathematics at Tarbiat Modares University.

M.Sc Thesis:

A new trust region method for unconstrained optimization (2006-2008).

Supervisor: Professor Nezam Mahdavi-Amiri

Ph.D. Dissertation:

An Analysis of Mean Square Stability of a Class of Runge-Kutta Methods for Solving Stochastic Differential Systems (2008-2013).

Supervisor: Professor Seyed Mohammad Hosseini

Research area:

- Numerical analysis, Scientific computations;
- Ordinary differential Equations (ODEs) and Numerical methods for ordinary differential equations;
- Stochastic differential Equations (SDEs) and some Numerical methods for stochastic differential equations;
 1. An analysis of stability of Runge-Kutta methods for SDE systems (Ph.D. Dissertation);
 2. Stiff stochastic differential equations and numerical method for solving these equations;
 3. Stochastic systems with non-globally Lipschitz coefficients.
 4. Stochastic differential equations.
 5. Truncated methods for SDEs with super-linear and irregular the coefficients, including piecewise continuous coefficients, Hölder coefficients, and concave diffusion coefficients.

Teaching experience:

- 2013 - present Razi University, Kermanshah, Iran.

Students Graduated:

Ph.D Degree:

Mohsen, Avaji, Stability Analysis of Runge-Kutta Methods for the Solution of Index 1 Stochastic Differential-Algebraic Equations, 2020.

M.S. Degree:

- Maryamsadat Sajadi, Split-Step Adams-Moulton Mistein methods foe systems of stiff stochastic differential equations. 2015.
- Elham veisi, Strong first order methods with adaptive time-stepping for solving stochastic differential equations.
- Fariba Azami, Novel methods for boundary value problems with Dirichlet and Neumann conditions, 2016.
- Zahra Bashiri, Numerical methods for linear and nonlocal boundary value problems, 2016.
- Bahare Geravand, Solutions of some initial and boundary value problems by spectral and collocation methods, 2017.
- Latif Thamer, Solutions of some initial and boundary value problems by spectral and collocation methods, 2018.
- Ladan Salimi, Implementation of multiple watermarking technique using frequency transforms and artificial neural network, 2018.
- Afshar Havasi, Numerical methods for approximation of the solutions of some kinds of fractional PDEs by Chebyshev polynomials, 2019.
- Fatemeh Maleki, Rational spectral methods for third-order singularly perturbed problems, 2019.
- Mahdie Moradi, Numerical methods for approximation of the solution of the fractional initial value problems by Legendre fractional functions, 2019.
- Leila Parvadideh, A new Spectral-Collocation method for solving generalized fractional integro-differential equations, 2020.
- Ronak Kasani, Numerical solutions of nonlinear fractional differential equations by alternative Legendre polynomials, 2021.
- Arman Alimohamadi, Collocation methods for solving initial and boundary value problems with fractional derivatives, 2020.

- Hadis Movafaghnejat, Explicit Runge-Kutta methods for stiff problems with a Gap in their eigenvalue spectrum, 2021.
- Shante Zaynab, Design and implementation of fuzzy soft expert system for heart disease diagnosis, 2017.(Advisor)
- Hora Fazel, Evaluation of Texture Features for Broken Bone Recognition, 2017.(Advisor)
- Mohsen Sharifi, Investigating the Influence of Personality on Pair Programming Using Fuzzy Cognitive Maps, 2016.(Advisor)

Publications:

1. A. Haghighi, S. M. Hosseini, On the stability of some second order numerical methods for weak approximation of Itô SDEs, *Numer. Algorithms* **57** (2011) 101–124.
2. A. Haghighi, S. M. Hosseini, A class of split-step balanced methods for stiff stochastic differential equations, *Numer. Algorithms* **61**(1) (2012) 141–162.
3. A. Haghighi, S. M. Hosseini, Analysis of asymptotic mean-square stability of a class of Runge–Kutta schemes for linear systems of stochastic differential equations, *Math. Comput. Simul.* **105** (2014) 17–48.
4. A. Haghighi, S. M. Hosseini, A. Rößler, Diagonally drift-implicit Runge–Kutta methods of strong order one for stiff stochastic differential systems, *J. Comput. Appl. Math.* **293** (2016) 82–93.
5. A. Haghighi, A. Rößler, Split-step double balanced approximation methods for stiff stochastic differential equations, *Int. J. Appl. Comput. Math.* **96**(5) (2019) 1–18.
6. M. Avaji, A. Jodayree Akbarfam, A. Haghighi, Stability analysis of high order Runge–Kutta methods for index 1 stochastic differential-algebraic equations with scalar noise, *Appl. Math. Comput.* **362** (2019) 124544.
7. A. Haghighi, New S-ROCK methods for stochastic differential equations with commutative noise, *IJNAO* **9**(1) (2019) 105–126.
8. L. Salimi, A. Haghighi, A. Fathi, A novel watermarking method based on differential evolutionary algorithm and wavelet transform, *Multimed. Tools Appl.* **79**(17) (2020) 11357–11374.
9. L. Salimi, A. Haghighi, An optimized alpha-blending watermarking technique in DWT domain for digital color images, *Wavelets and Linear Algebra* **7**(3) (2021) 51–78.

10. A. Haghighi, An explicit two-stage truncated Runge–Kutta method for nonlinear stochastic differential equations, *Math. Sci.* (2023).
11. A. Haghighi, A truncated split-step forward Euler–Maruyama-based method for stochastic systems with non-globally Lipschitz coefficients, *Iran. J. Sci.* **47** (2023) 137–153.
12. A. Haghighi, Modified Runge–Kutta method with convergence analysis for nonlinear stochastic differential equations with Hölder continuous diffusion coefficient, *IJNAO* **13** (2023) 285–316.
13. A. Haghighi, A modified split-step truncated Euler–Maruyama method for SDEs with non-globally Lipschitz continuous coefficients, *Comput. Methods Differ. Equ.* **11**(3) (2023) 522–534.
14. A. Haghighi, An explicit split-step truncated Milstein method for stochastic differential equations, *Comput. Methods Differ. Equ.* **11**(4) (2023).
15. A. Haghighi, Convergence of a partially truncated Euler–Maruyama method for SDEs with super-linear piecewise continuous drift and Hölder diffusion coefficients, *Numer. Algorithms* **99**(4) (2025) 1697–1742.
16. A. Haghighi, Mean-square convergence of an explicit derivative-free truncated method for SDEs with highly nonlinear coefficients, *J. Comput. Appl. Math.* **460** (2025) 116416.
17. A. Haghighi, N. Nyamoradi, Dynamics of a stochastic epidemic model for infectious diseases: inclusion of the environmental contamination factor, *J. Appl. Math. Comput.* **71** (Suppl 1) (2025) 1033–1060.
18. A. Haghighi, Convergence of a positivity preserving logarithmic truncated EM method for SDEs with discontinuous drift coefficients, *Appl. Math. Comput.* **510** (2026) 129704.
19. A. Haghighi, A split-step Euler–Maruyama based method with partial truncation coefficients for non-linear SDEs, *submitted*.
20. A. Haghighi, Strong convergence of an explicit truncated quasi-Milstein method for locally Lipschitz SDEs with discontinuous drift coefficients, *submitted*.

Conference and given seminar talk:

- Mean square stability of numerical methods for weak solution of SDEs, **7th International Congress on Industrial and Applied Mathematics, July 18-22, 2011 in Vancouver, BC, Canada.**
- On the mean-square stability of a strong first order S-ROCK method for linear systems of stochastic differential equations, **48th annual iranian mathematics, Agust 15, 2017 in Hamedan, Iran..**

- Numerical solutions of the Cox-Ingersoll-Ross Interest Rate Model, **The 11th International Conference of Iranian Operations Research Society.**
- A Runge-Kutta method for index 1 stochastic differential-algebraic equations with additive noise, **49th annual iranian mathematics, Agust 10, 2018 in Tehran, Iran..**
- On simulation of stochastic marine bacteriophage infection model, **The first international conference on mathematics and its application Agust 10, 2021 in Ahwaz, Iran.**