

Mohammad Reza Eslahchi

CONTACT

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CURRENT POSITION

September 2007-Now **Associate Professor of Mathematics, Optimization**
Tarbiat Modares University, Tehran, Iran.

ADMINISTRATIVE EXPERIENCES

2008-Now **Vice Chancellor for Students Affairs,**
Tarbiat Modares University, Tehran, Iran.

2010-2014 **Head,** Department of Applied Mathematics,
Tarbiat Modares University, Tehran, Iran.

2007-2008 **Dean,** Faculty of Mathematical Science,
Tarbiat Modares University, Tehran, Iran.

EDUCATION

- 2002-2007 **Received Ph.D. in Applied Mathematics, Numerical Analysis**
Amirkabir University of Technology (AUT), Iran.
Supervisor: Dr. Mehdi Dehghan
- 1998-2000 **Received M.Sc. in Applied Mathematics, Optimization**
Sharif University of Technology (SUT), Iran.
Supervisor: Dr. Nezam Mahdavi-Amiri
- 1993-1998 **Received B.Sc. in Mathematics in Computer Science**
Amirkabir University of Technology (AUT), Iran.

RESEARCH INTEREST

- Numerical Analysis
- Approximation Theory
- Optimization
- Best Approximation
- Matrix Computation
- Functions of Matrices
- Image Processing
- Modelling
- Computer Programming

HONOR AND AWARDS

- Granted distinguished talent in Ph.D.
- Ranked 7th in the 1997 nationwide university entrance exam for mathematics graduate studies, Iran.
- Best student of Iran universities, 2007.

- Ranked 1st among Ph.D. students in applied mathematics at AUT, 2007.
- Ranked 1st among graduated M.Sc. students in applied mathematics at SUT, 2000.
- Ranked 1st among B.Sc. students in mathematics in computer science at AUT, 1998.

PUBLICATIONS

2017

- 1 H Khosravian-Arab, M Dehghan, MR Eslahchi, Fractional spectral and pseudo-spectral methods in unbounded domains: Theory and applications, *Journal of Computational Physics*.
- 2 H Khosravian-Arab, M Dehghan, MR Eslahchi, Generalized Bessel functions: Theory and their applications, *Mathematical Methods in the Applied Sciences*.
- 3 S Esmaili, MR Eslahchi, Optimal Control for a Parabolic–Hyperbolic Free Boundary Problem Modeling the Growth of Tumor with Drug Application, *Journal of Optimization Theory and Applications*.
- 4 H Khosravian-Arab, M Dehghan, MR Eslahchi, Generalized Bessel functions: Theory and their applications, *Mathematical Methods in the Applied Sciences*.
- 5 M Parvizi, MR Eslahchi, A numerical method based on extended Raviart–Thomas (ER-T) mixed finite element method for solving damped Boussinesq equation, *Mathematical Methods in the Applied Sciences*.
- 6 H Khosravian-Arab, M Dehghan, MR Eslahchi, A new approach to improve the order of approximation of the

Bernstein operators: theory and applications, Numerical Algorithms.

- 7 S Esmaili, MR Eslahchi, Application of collocation method for solving a parabolic-hyperbolic free boundary problem which models the growth of tumor with drug application, Mathematical Methods in the Applied Sciences.

2016

- 8 S Esmaili, MR Eslahchi, A modified spectral method for solving operator equations, Journal of Computational and Applied Mathematics.
- 9 MR Eslahchi, M Masjed-Jamei, On q-interpolation formulae and their applications, Electronic Transactions on Numerical Analysis.

2015

- 10 MR Eslahchi, M Masjed-Jamei, Some applications of a hypergeometric identity, Mathematical Sciences.
- 11 H Khosravian-Arab, M Dehghan, MR Eslahchi, Fractional Sturm–Liouville boundary value problems in unbounded domains: Theory and applications, Journal of Computational Physics.
- 12 MR Eslahchi, M Dehghan, S Amani, Chebyshev polynomials and best approximation of some classes of functions, Journal of Numerical Mathematics.
- 13 M Parvizi, MR Eslahchi, M Dehghan, Numerical solution of fractional advection-diffusion equation with a nonlinear source term, Numerical Algorithms.

- 14 M Parvizi, MR Eslahchi, The convergence and stability analysis of the Jacobi collocation method for solving nonlinear fractional differential equations with integral boundary conditions, *Mathematical Methods in the Applied Sciences*.

2014

- 15 A Kayedi-Bardeh, MR Eslahchi, M Dehghan, A method for obtaining the operational matrix of fractional Jacobi functions and applications, *Journal of Vibration and Control*.
- 16 MR Eslahchi, M Dehghan, M Parvizi, Application of the collocation method for solving nonlinear fractional integro-differential equations, *Journal of Computational and Applied Mathematics*.

2013

- 17 S Aryanmehr, M Dehghan, MR Eslahchi, The weighted $(0, 1, \dots, m-2, m)$ -interpolation technique based on the roots of the classical orthogonal polynomials and application in deriving new quadrature rules, *Acta Mathematica Hungarica*.
- 18 MR Eslahchi, M Parvizi, Application of Collocation Method in Finding Roots, *Iranian Journal of Mathematical Sciences and Informatics*.
- 19 M Dehghan, S Aryanmehr, MR Eslahchi, A technique for the numerical solution of initial-value problems based on a class of Birkhoff-type interpolation method, *Journal of Computational and Applied Mathematics*.

2012

- 20 MR Eslahchi, S Amani, The best uniform polynomial approximation of two classes of rational functions, *Iranian Journal of Mathematical Sciences and Informatics*.
- 21 MR Eslahchi, M Dehghan, S Ahmadi_Asl, The general Jacobi matrix method for solving some nonlinear ordinary differential equations, *Applied Mathematical Modelling*.

- 22 MR Eslahchi, M Dehghan, S Amani, The third and fourth kinds of Chebyshev polynomials and best uniform approximation, *Mathematical and Computer Modelling*.

2011

- 23 MR Eslahchi, M Dehghan, Application of Taylor series in obtaining the orthogonal operational matrix, *Computers & Mathematics with Applications*.

2010

- 24 M Dehghan, MR Eslahchi, Best uniform polynomial approximation of some rational functions, *Computers & mathematics with applications*.

2009

- 25 MR Eslahchi, M Dehghan, The best uniform polynomial approximation to class of the form, *Nonlinear Analysis: Theory, Methods & Applications*.
- 26 MR Eslahchi, M Dehghan, Quadrature rules using an arbitrary fixed order of derivatives, *Computers & Mathematics with Applications*.

2006

- 27 SM Hashemiparast, M Masjed-Jamei, MR Eslahchi, M Dehghan, The second kind Chebyshev–Newton–Cotes quadrature rule (open type) and its numerical improvement, *Applied mathematics and computation*.
- 28 SM Hashemiparast, MR Eslahchi, M Dehghan, A note on equal coefficient quadrature rules, *Applied mathematics and computation*.
- 29 M Dehghan, M Masjed-Jamei, MR Eslahchi, Weighted quadrature rules with weight function, *Applied mathematics and computation*.
- 30 SM Hashemiparast, MR Eslahchi, M Dehghan, Numerical integration using the derivatives, *Applied mathematics and computation*.
- 31 E Babolian, M Dehghan, MR Eslahchi, Application of Gauss quadrature rule in finding bounds for solution of linear systems of equations, *Applied mathematics and computation*.

- 32 M Masjed-Jamei, MR Eslahchi, M Dehghan, A statistical approach for economization of the polynomial functions, *International Journal of Computer Mathematics*.
- 33 SM Hashemiparast, MR Eslahchi, M Dehghan, Minimizing the error function of Gauss–Jacobi quadrature rule with respect to parameters α and β , *Applied mathematics and computation*.
- 34 SM Hashemiparast, MR Eslahchi, M Dehghan, Determination of nodes in numerical integration rules using difference equation, *Applied mathematics and computation*.
- 35 M Dehghan, M Masjed-Jamei, MR Eslahchi, On numerical improvement of open Newton–Cotes quadrature rules, *Applied mathematics and computation*.
- 36 SM Hashemiparast, MR Eslahchi, M Dehghan, M Masjed-Jamei, The first kind Chebyshev–Newton–Cotes quadrature rules (semi-open type) and its numerical improvement, *Applied mathematics and computation*.
- 37 E Babolian, M Masjed-Jamei, MR Eslahchi, M Dehghan, On numerical integration methods with T-distribution weight function, *Applied mathematics and computation*.
- 38 M Masjed-Jamei, SM Hashemiparast, MR Eslahchi, M Dehghan, The first kind Chebyshe Lobatto quadrature rule and its numerical improvement, *Applied Mathematics and Computation*.
- 39 M Masjed-Jamei, SM Hashemiparast, MR Eslahchi, M Dehghan, The second kind Chebyshev quadrature rules of semi-open type and its numerical improvement, *Applied mathematics and computation*.

2005

- 40 M Masjed-Jamei, SM Hashemiparast, MR Eslahchi, M Dehghan, The first kind Chebyshev–Lobatto quadrature rule and its numerical improvement, *Applied mathematics and computation*.
- 41 MR Eslahchi, M Dehghan, M Masjed-Jamei, The equal coefficients quadrature rules and their numerical improvement, *Applied mathematics and computation*.

- 42 M Dehghan, M Masjed-Jamei, MR Eslahchi, The semi-open Newton–Cotes quadrature rule and its numerical improvement, Applied mathematics and computation.
- 43 MR Eslahchi, M Dehghan, M Masjed-Jamei, The first kind Chebyshev–Newton–Cotes quadrature rules (closed type) and its numerical improvement, Applied mathematics and computation.
- 44 M Dehghan, M Masjed-Jamei, MR Eslahchi, On numerical improvement of the second kind of Gauss–Chebyshev quadrature rules, Applied mathematics and computation.
- 45 M Masjed-Jamei, MR Eslahchi, M Dehghan, On numerical improvement of Gauss–Radau quadrature rules, Applied mathematics and computation.
- 46 M Dehghan, M Masjed-Jamei, MR Eslahchi, On numerical improvement of closed Newton–Cotes quadrature rules, Applied Mathematics and Computation.
- 47 MR Eslahchi, M Dehghan, M Masjed-Jamei, On numerical improvement of the first kind Gauss–Chebyshev quadrature rules, Applied Mathematics and Computation.
- 48 MR Eslahchi, M Masjed-Jamei, E Babolian, On numerical improvement of Gauss–Lobatto quadrature rules, Applied Mathematics and Computation.
- 49 E Babolian, M Masjed-Jamei, MR Eslahchi, On numerical improvement of Gauss–Legendre quadrature rules, Applied Mathematics and Computation.

HOT PAPERS

- 1 MR Eslahchi, M Dehghan, M Parvizi, Application of the collocation method for solving nonlinear fractional integro-differential equations, Journal of Computational and Applied Mathematics.

CONFERENCES

- 1 On Numerical Solution of Some ill-Condition Nonlinear Systems, International Conference on Numerical Analysis and Applied Mathematics 2004 (ICNAAM), with S. M. Hashemiparast and M. Masjed-Jamei (AMS Conference).
- 2 Numerical solution of linear integral equations using modified Gauss-Legendre quadrature rules, International Conference on Numerical Analysis and Applied Mathematics 2005 (ICNAAM), with S. M. Hashemiparast and M. Masjed-Jamei (AMS Conference).

STUDENTS

Post-Doctorial

- Dr. S. Esmaili, Solving mathematical models and study its optimal control problems, 1396 (2017).

Ph.D.

- S. Esmaili, Solving some operator equations using analytical and numerical methods and their applications, 1395 (2016).
- M. Parvizi, Solving differential operators using multilevel approaches with applications, 1392 (2014).
- F. Kazemi, Regularization models based on fractional order derivatives in image processing, 1392 (2014).

M.Sc.

- F. Hajimohamadi, The best approximation of functions of matrices, 2016.

- S. Ahmadi Asl, Jacobi collocation method for MHD plane and axisymmetric flow near a stagnation point, 2011.
- M. Asghari, On pal (Birkhoff) interpolation and its development with applications, 2011.
- M.R. Ganj Khanloo, Radial basis functions with emphasis on RBF-QR method, 2013.
- M. Kavoosi, Approxiation of rational Bezier and B-spline curves and its application in geometric design, 2015.
- M. Pakbaz Anjendani, Application of Jacobi matrix method for solving high order linear differenc equations, 2012.
- M. Parvizi, Application of spectral methods for solving fractional differential equations (partial and ordinary), 2013.
- N. Rashidi, The use of preconditioned iterative methods for solving nonsingular linear systems, 2015.
- M. Shafa, Solution of the optimal control prolems governed by PDEs by numerical methods, 2014.
- A. Kayedi, Numerical solution of fractional differential and integro-differential equations by using spectral methods based on operational matrices, 2013.
- S. Amani, Best uniform approximation of some classes of rational functions, 2011.
- Z. Gharibi, The study of conforming finite element method and its application in solving ordinary-fractional partial differential equations, 2016.
- M. Javanmard, Application of radial basis functions (RBFs) for numerical solution of differential equations, 2014.
- Z. Moallemi, Employing the spectral methods for solving ordinary and partial differential equations by mapped basic functions, 2014.
- N. Namaki, Application of partial differential equations in image processing, 2017.
- E. Khalili, The Study of Vandermonde and Vandermonde-like matrices with the ill-posed approach, 2017.

- E. Jafari, The study of the kernel-based methods and their applications, 2017.
- S. Khormaeipour, Application of Iterative Methods for Solving Linear Saddle Point Systems, 2017.
- E. Majd, study of the hypergeometric functions with matrix approach, 2017.

COMPLETED RESEARCH PROJECTS

- 1 Application of Gaussian quadrature's in computing of matrix inverse and optimization problems, Kharazmi University, 2007.
- 2 Development ranking of Golestan province cities using fuzzy logic, Ministry of Interior, 2008.
- 3 Application of Taylor series in obtaining operational matrices, National Elite Foundation, 2012.
- 4 Implementing and fault tolerating SAR image formation algorithms, Iran Electronic Sanaie, 2016.
- 5 Introducing a new iterative method to solve ordinary differential equations and its applications, Iran National Science Foundation, 2017.

TEACHING EXPERIENCE

- Approximation theory
- Matrix computation
- Fourier analysis
- Optimization
- Calculus of variation and optimal control
- Advances operational research
- Numerical linear algebra
- Numerical computation

COMPUTER SKILLS

- Programming skills with Pascal and C++.
- Proficient programming skills in Maple, Matlab, Latex and Microsoft Office.

MEMBERSHIP

- National Elites Foundation.
- Organization for Students of Exceptional Talents in AUT.
- Iranian Mathematics Society.