

Abbas Salemi Parizi

Professor

Applied Math. Department
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Personal Information

Birth records: 1963, Karaj, Iran.

Research Interest: Matrix Analysis, Numerical Linear Algebra, and Data Science.

Links: Home page, Google Scholar

Educations

1984-1988 **BS**, Dept. of Mathematics, Shahid Bahonar University of Kerman, Iran.

1988-1990 **MSC**, Dept. of Mathematics, Shahid Bahonar University of Kerman, Iran.

1990-1994 **Ph.D.**, Dept. of Mathematics, Shahid Bahonar University of Kerman, Iran.

Sabbatical leaves

2022-2023 University of Washington, Seattle, September 2022-January 2023, USA.

2017 University of Washington, Seattle, January-September 2017, USA.

2006-2007 College of William and Mary, Virginia, , September, 2016- August, 2017, USA.

2001-2002 University of Toronto, Toronto, September, 2021-August, 2022, Canada.

1993 International Center for Theoretical Physics, Summer, 1993, Trieste, Italy.

Administration Duties

2024-Now **Member**, Executive Council of the Iranian Mathematical Society.

2022-Now **Member**, Iranian Academy of Science .

2021-Now **Member**, Board of Trustees, Mehdi Radjabalipour Prize.

2018-2022 **Director**, Mahani Mathematical Research Center.

2018-2023 **Member**, SBUK University Promotion committee.

2012-2018 **Member**, Executive Council of the Iranian Mathematical Society.

2010-2021 **Member**, Board of Trustees, Abbas Riazi Kermani Prize.

2006-2010 **Member**, Center of Excellence in Linear Algebra and Optimization.

2004-2006 **Chair**, Department of Mathematics, Shahid Bahonar University of Kerman.

1997-2004 **Assistant Dean**, Faculty of Math. and Comput., Shahid Bahonar University.

1995-1997 **Dean**, Faculty of Science, Vali-Asr University of Rafsanjan.

1991-1995 **Chair**, Department of Mathematics, Vali-Asr University of Rafsanjan.

Editorial Board

- 2013–2016 **Editor-in-Chief**, *Bulletin of the Iranian Mathematical Society*.
2014–Now **Editor**, *Wavelets and Linear Algebra*.
2012–Now **Editor**, *Journal of Mahani Mathematical Research*.
2010–Now **Editor**, *Bulletin of the Iranian Mathematical Society*.

Organization of Conference/Seminars/ Workshops

- 2021 **Secretary, Scientific Committee**, 52nd Annual Iranian Mathematics Conference, Shahiade Bahonar University of Kerman, Iran, 30 August- 2 September 2021.
- 2020 **Secretary**, 10th Seminar on Linear Algebra and Its Applications, Shahiade Bahonar University of Kerman, Iran, 16-19 August 2020.
- 2010 **Secretary**, Workshop on Numerical Linear Algebra and Its Applications, Shahiade Bahonar University of Kerman, Iran, 4-5 May 2010.
- 2004 **Secretary**, Third Seminar on Linear Algebra and Its Applications, Shahiade Bahonar University of Kerman, Iran, 27-29 December 2004.
- 2004 **Secretary**, Operator Inequalities Workshop, Shahiade Bahonar University of Kerman, Iran, 25-26 December 2004.

Teaching Materials

- Under graduate Mathematical Analysis, Linear Algebra, Numerical Linear Algebra, Matrix Theory, Discrete Mathematics, Topology, Complex Functions, Calculus, Differential equations.
- Post graduate Advanced Linear Algebra, Matrix Analysis, Numerical Linear Algebra, Real Analysis, Operator Theory, Functional Analysis, Matrix Inequalities, Numerical Range, Quantum Computing, Spectral Graph Theory, Matrix methods in Data mining and pattern recognition. Mathematical Foundation of Data Science, Matrix methods in Machine Learning.
- Fall 2025 Current semester: Advanced Real Analysis, Mathematical Foundation of Data Science

Publications

- 2026 **Further characterizations of W-weighted core-EP matrices**, (joint E. Kheirandish, Qing-Wen Wang), Journal of Computational and Applied Mathematics, 472, 116788.
- 2025 **Bilinear Self-Representation for Unsupervised Feature Selection with Structure Learning**, (joint H. Naser-Asadi, F. Kyanfar and F. Saberi-Movahed), Neurocomputing, 625,129557.
- 2025 **A modified block Hessenberg method for low-rank tensor Sylvester equations**, (joint E. Kheirandish, N. Thome), Journal of Computational and Applied Mathematics, 456, 116209.
- 2024 **Alternative Arnoldi process for ill-conditioned tensor equations with application to image restoration**, (joint M. Bagheri, A. Tajadini, and F. Kyanfar), Computational and Applied Mathematics, Vol. 43, No. 375; <https://doi.org/10.1007/s40314-024-02886-1>.
- 2024 **Properties of core-EP matrices and binary relationships**, (joint E. Kheirandish, N. Thome), Computational and Applied Mathematics, Vol. 43, No. 316; <https://doi.org/10.1007/s40314-024-02836-x>.
- 2023 **An equivalent condition for linear preservers of multivariate group majorization on matrices**, (joint M. Soleymani), Wavelets and Linear Algebra, Vol 10, No. 2, 71- 80.
- 2023 **Generalized bilateral inverses of tensors via Einstein product with applications to singular tensor equations**, (joint E. Kheirandish), Computational and Applied Mathematics, <https://doi.org/10.1007/s40314-023-02483-8>. 42; 343.
- 2023 **Generalized bilateral inverses**, (joint E. Kheirandish), Journal of Computational and Applied Mathematics, <https://doi.org/10.1016/j.cam.2023.115137>. 428; 115137
- 2023 **A new simultaneously compact finite difference scheme for high-dimensional time-dependent PDEs**, (joint R. Doostaki and M.M. Hosseini), Mathematics and Computers in Simulation, Vol 212, 504-523.
- 2022 **Estimation of the regression function by Legendre wavelets**, (joint M. Hamzehnejad and M.M. Hosseini), Iranian Journal of Numerical Analysis and Optimization, Vol. 12, No. 3, 497-512.
- 2022 **An improved upper bound for ultraspherical coefficients**, (joint M. Hamzehnejad and M.M. Hosseini), Journal of Mathematical Modeling, Vol. 10, No. 3, 421-431.
- 2022 **Error analysis and Kronecker implementation of Chebyshev spectral collocation method for solving linear PDEs**, (joint M. Razavi and M.M. Hosseini), Computational methods for differential equations, Vol. 10, No. 4, 914-927.

- 2022 **Global-DGMRES method for matrix equation $AXB=C$** , (joint M. Safarzadeh and H. Sadeghi Goughery), International Journal of Computer Mathematics , Vol. 99 No. 5, 1005-1021.
- 2021 **Some inequalities related to 4-convex functions**, (joint Sh. Mohtashami and M. Soleymani), Wavelets and Linear Algebra, Vol. 8 No.1, (2021) 17- 26..
- 2021 **On Hermitian Positive Definite Solutions of a Nonlinear Matrix Equation**, (joint M. Masoudi), Journal of Fixed Point Theory and Applications, <https://doi.org/10.1007/s11784-021-00867-z>.
- 2021 **DISCERN: Diversity-based Selection of Centroids for k-Estimation and Rapid Non-stochastic Clustering**, (joint A. Hassani, A. Iranmanesh and M. Eftekhari), International Journal of Machine Learning and Cybernetics, Vol 12 (2021) 635–649.
- 2020 **Perturbation bounds for matrix functions**, (joint M. Masoudi), Mathematical Inequalities and Applications, Vol. 23, No. 3, (2020), 1105–1115.
- 2020 **Polynomial numerical hulls of the direct sum of two Jordan blocks**, (joint S. Karami), Linear Algebra and its Applications, Vol 585 (2020) 209-226.
- 2019 **On spectral radius of graphs with pendant paths** , (joint H. Passbani), Linear Algebra and its Applications, Vol. 571, (2019), 26-40.
- 2019 **Linear preservers of circulant majorization on rectangular matrices**, (joint Sh. Mohtashami and M. Soleymani), Linear and Multilinear Algebra, Vol. 67, No. 8, (2019), 1554–1560.
- 2018 **On the Convergence Rate of DGMRES** , (joint A. Greenbaum and F. Kyangfar), Linear Algebra and its Applications, Vol. 552, (2018), 219-238.
- 2018 **On a new generalized inverse of matrices**, (joint M. Mehdipour), Linear and Multilinear Algebra, 66 No. 5, (2018), 1046-1053.
- 2018 **DGMRES and index numerical range of matrices**, (joint M. Safarzadeh), Journal of Computational and Applied Mathematics, 335 (2018) 349–360.
- 2017 **Hermitian positive definite solutions of the matrix equation $X^s + A^*X - tA = Q$** , (joint M. Mohseni Moghadam, M. Masoudi), J. Korean Math. Soc., 54 No. 6, (2017), 1667–1682.
- 2016 **Quantum error-correction for a sub-group of the Pauli group using higher-rank numerical range**, (joint Sayyed Ahmad Mousavi), Linear and Multilinear Algebra, Vol. 64-1 (2016), 68-77.
- 2016 **An orthogonality in normed linear spaces based on angular distance inequality**, (joint F. Dadipour, F. Sadeghi), Aequat. Math., Vol.90 No. 2 (2016) 281-297.
- 2015 **Joint higher rankk numerical range of Pauli group**, (joint S.A. Mousavi), Linear and Multilinear Algebra, Vol. 63-3 (2015), 439-454..
- 2015 **Characterizations of inner product spaces involving homogeneity of isosceles orthogonality**, Archiv der Mathematik, (joint F. Dadipour, F. Sadeghi), Vol. 104, 5, (2015), 431-439.

- 2015 **Polynomial numerical hulls of the direct sum of a normal matrix and a Jordan block**, *Linear Algebra and its Applications*, (joint S. Karami), Vol. 465 (2015), 143-160.
- 2014 **Complete stagnation of GMRES for normal matrices**, *Computational and Applied Mathematics*, (joint F. Kyanfar and M. Mohseni Moghadam), Vol. 263 (2014), 417-422.
- 2014 **On revising of the modified young inequality**, *Ann. Funct. Anal.*, (joint A. Sheikh Hosseini), Vol. 5 No.1 (2014), 70-76.
- 2013 **Matrix Young numerical radius Inequalities**, *Mathematical Inequalities and Applications*, (joint A. Sheikh Hosseini), Vol. 16 No. 3 (2013), 783-791.
- 2013 **Some results on the polynomial numerical hulls of matrices**, *Bulletin of the Iranian Mathematical Society*, (joint H.R. Afshin and M.A. Mehrjoofard), Vol. 39 No. 3 (2013) , 569-578.
- 2012 **On linear preservers of lgw-majorization on $M_{n,m}$** , *Bulletin of the Malaysian Mathematical Science Society* , (joint A. Armandnejad), Vol. 35 No. 3 (2012), 755-764.
- 2012 **Higher rank numerical hulls of matrices**, *Operator and Matrices*, Vol. 6 No. 1 (2012), 79-84.
- 2011 **Polynomial numerical hulls of matrix polynomials II**, *Linear and Multilinear Algebra*, (Joint Gh.R. Aghamollaei), Vol. 59 No. 3 (2011), 291-302.
- 2011 **Linear Preservers of majorization**, *Iranian Journal of Mathematical Sciences and Informatics*, (Joint F. Khalooei), Volume 6, Number 2 (2011), 43-50.
- 2011 **Total decomposition and block numerical ranges**, *Banach J. Math. Anal.*, Vol. 5 No. 1 (2011), 51-55.
- 2011 **Polynomial inverse images and polynomial numerical hulls of normal matrices**, *Operators and Matrices*, (joint H.R. Afshin and M.A. Mehrjoofard), Vol.5 No.1 (2011),89-96.
- 2009 **Polynomial numerical hulls of order 3**, *Electronic journal of Linear Algebra*, (joint H.R. Afshin and M.A. Mehrjoofard), 18 (2009),253-263.
- 2009 **Quadratic forms on S^1 generated by a matrix**, *International Journal on Applied Mathematics*, (Joint Gh.R. Aghamollaei), vol. 22, No. 1 (2009), 129-137.
- 2009 **The structure of linear preservers of left matrix majorization**, *Electronic Journal of Linear Algebra*, (Joint F. Khalooei), 18 (2009), 88-97.
- 2008 **Polynomial numerical hulls of matrices**, *Linear Algebra and its Applications*, (joint Ch. Davis, Chi-Kwong Li), 428 (2008), 137-153.

- 2007 **G-majorization and linear preservers of gs-Majorization**, *Journal of DSGT*, (joint A. Armandnejad), vol. 2 (2007), 165-168.
- 2007 **Polynomial numerical hulls of matrix polynomials**, *Linear and Multilinear Algebra*, (joint Gh. Aghamolaei), Vol. 55, No. 3 (2007), 219-228.
- 2007 **Analysis of symmetric matrix valued functions**, *Numerical Functional Analysis and Optimization*, (joint H. Mohebi), Vol. 28, No. 5-6 (2007), 691-715.
- 2006 **The structure of linear preservers of gs-majorization**, *Bulletin of the Iranian Mathematical Society*, (joint A. Armandnejad), Vol. 32 No. 2 (2006), 31-42.
- 2004 **On polynomial numerical hulls of normal matrices**, *Linear Algebra and its Applications*, (joint Ch. Davis), 383 (2004), 151-161.
- 2004 **Shell of quadratic numerical range**, *Far East Journal of Mathematical Sciences*, (joint H.R. Afshin), Vol. 12, No. 1 (2004), 83-87.
- 2003 **Quadratic numerical range of block operator matrices**, *Far East Journal of Mathematical Sciences*, (joint H.R. Afshin), Vol. 10, No. 1 (2003), 99-103.
- 2000 **Differentiable eigenvalues of the perturbed quadratic matrix functions**, *Mathematische Nachrichten*, 217 (2000), 141-146.
- 1996 **On eigenvalues of quadratic matrix polynomials and their perturbations**, *SIAM Journal on Matrix Analysis*, (joint M. Radjabalipour), Vol. 17, No. 3 (1996) 563-569.
- 1995 **On eigenvalues of perturbed quadratic matrix polynomials**, *Integral Equations and Operator Theory*, (joint M. Radjabalipour), Vol. 22 (1995) 242-247.

--- Expository papers

- 2012 **In presence of the professor (in Persian)**, Anthology of articles in honor of the prestigious scholar Professor Mehdi Radjabalipour, Iranian Academy of Science, (2012) 21-25.
- 2010 **New Approach to Mathematical Analysis (in Persian)**, (Joint F. Fatehi), Newsletter of the Iranian Mathematical Society, vol.32 No 3-4, (2010), 6-7.
- 2010 **Walter Rudin (in Persian)**, *Newsletter of the Iranian Mathematical Society*, vol.32 No 1, (2010), 6.
- 2009 **Linear Algebra in Iran**, (joint M. Radjabalipour), Proceeding of the 5th Seminar on Linear Algebra and its Applications, 28-30 Oct. 2009, Babolsar.

Graduated Ph.D. students

- 2025 **B. Khozaie**, *Spectral Clustering of Graphs and Applications*, (joint M. Eftekhari and T. Sistani).
- 2025 **M. Bagheri**, *Tensor Krylov subspace methods for solving large tensor equations*, (joint A. Tajaddini and F. Kyanfar).
- 2024 **E. Kheirandish**, *Generalized inverse and iterative methods*.
- 2022 **M. Hamehnejad**, *Volatility modeling using theory of wavelets*, (joint M.M. Hosseini).
- 2022 **M. Razavi**, *Estimating of option price in financial markets by spectral methods*, (joint M.M. Hosseini).
- 2019 **H. Passbani**, *On spectra of trees and their applications*.
- 2019 **Sh. Mohtashami**, *Group majorizations and their linear preservers*, (joint M. Soleymani).
- 2017 **M. Mehdipour**, *Generalized inverse of matrices and its parallel sum*.
- 2017 **M. Safarzadeh**, *Krylov methods and their relation to polynomial numerical hulls of matrices*.
- 2015 **F. Sadeghi**, *Orthogonality of vectors and matrices in normed linear spaces*.
- 2015 **S. Karami Zarandi**, *Polynomial numerical hulls of matrices and iterative methods for solving linear systems*.
- 2014 **S.A. Mousavi**, *Quantum error correction and joint higher rank numerical range*.
- 2013 **A. Sheikh Hosseini**, *Matrix Young Inequalities*.
- 2009 **F. Khalooei**, *Linear Preservers of left matrix majorization*.
- 2006 **A. Armandnejad**, *G-stochastic matrices and linear preservers of G-majorization*.
- 2006 **Gh.R. Aghamollaei**, *Polynomial numerical hulls of matrix polynomials*.
- 2003 **H.R. Afshin**, *On numerical range and polynomial numerical hulls of matrices and operators*.

Graduated M.Sc. Students

- 2025 **N. Rezanejad**, *Dimensionality Reduction Methods*, (joint F. Saberi-Movahed).
- 2020 **M. Abolhassani**, *High-order Majorization*.
- 2019 **Z. Farahmand**, *Trumping And Power Majorization*.
- 2017 **A. Jafari**, *Stagnation of the Drazin Generalized Minimal Residual Method*.
- 2016 **A. Jalalabadi**, *Crouzeix's conjecture and GMRES method*.
- 2015 **H.Ghasemi**, *On the properties of accretive-dissipative matrices*.
- 2015 **M. Samareh-Jahani**, *Bounds on energy and Laplacian energy of a graph*.
- 2014 **H. Selahshour**, *Spectral radius of a graph and applications*.

- 2013 **N. Hava**, *Positive definite solutions of matrix equations.*
- 2013 **M. Taheri**, *Totally nonnegative matrices.*
- 2013 **M. Mirzaee**, *Majorization inequalities.*
- 2012 **M. Zaree**, *Ratio field of values.*
- 2012 **S. Hashemi**, *Polynomial numerical hulls and projection methods.*
- 2011 **M. Mehdipour**, *Young and Heinz inequalities for matrices.*
- 2011 **M. Eskafian**, *Indefinite higher rank numerical range.*
- 2011 **R. keshvarzi**, *Numerical range of rectangular matrices.*
- 2010 **V. Dehghani**, *Entrywise functions of Matrices.*
- 2010 **F. Sadeghi**, *Orthogonality of vectors and matrices in normed linear spaces.*
- 2010 **M. Soleymani**, *Matrix Version of the Young Inequality.*
- 2009 **S. A. Mousavi**, *Quantum Computing and Higher rank Numerical Range.*
- 2009 **S. Ghani pour**, *Higher Rank Numerical Range of Matrices.*
- 2008 **N. Anjomshoaa**, *Higher Rank Numerical Range of Matrices.*
- 2006 **Sh. Rezagholi**, *Polynomial numerical hulls of matrices and matrix polynomials.*
- 2006 **T. Mohammadi**, *Majorization of vectors and Matrices.*
- 2004 **M. Safarzadeh**, *Polynomial numerical hulls of Toeplitz matrices.*
- 2004 **kh. Riahi**, *Norm Bounds for summation of two normal matrices.*
- 2003 **F. Kavari**, *Homotopy continuation methods for solving polynomial systems.*
- 2003 **M. Fazlollahi**, *mth numerical range of operators.*
- 2001 **Gh. Aghamollaei**, *numerical range of matrix polynomials.*
- 2000 **H. Habibi**, *Jordan matrices and theirs numerical ranges.*
- 2000 **M. Teymournia**, *Finite automata generating real functions.*
- 1999 **E. Hashemi**, *Spectral components of selfadjoint block operator matrices.*
- 1999 **J. Jesmani**, *Essential spectrum and extremal principles of operators.*
- 1999 **F. Khaleei**, *Quadratic matrix polynomials with a parameter.*
- 1998 **H. R. Rezazadeh**, *Classification of the singularities for time optimal systems.*
- 1998 **A. Janat-Alipour**, *Spectral decomposition of nonselfadjoint b-operator matrices.*
- 1997 **H. Adeli**, *Derivative of eigenpairs of Matrix functions.*

Selected Seminars, Conferences, Workshops and Lectures

- 2025 **The Sixth Public Lecture of the Soft Computing Laboratory**, 1 June, 2025, Graduate University of Advanced Technology, Kerman, Iran.
- 2025 **Union of Educational and Scientific Associations of Iranian Mathematics Teachers**, 13 January, 2025, Online.
- 2025 **Colloquium lectures**, 13 April , 2025, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran.

- 2024 **Mahani Mathematical Research Center**, 6 October, 2024, Shahid Bahonar University of Kerman, Iran.
- 2023 12th—**Algebra day**, 26 October, 2023, Isfahan Mathematics House, Iran.
- 2023 12th **Seminar on Linear Algebra and its Applications**, July 18-19, 2023, Tabriz, Iran.
- 2019 5th **Seminar on Operator Theory and Its Applications**, March 13-14, 2019, Zanzan, Iran.
- 2018 **International Conference on Matrix Inequalities and Matrix Equations (MIME2018)**, June, 8-11, 2018, Shanghai, China.
- 2017 **Korea-China International conference on Matrix Theory and applications**, December, 14-17, 2017, Suwon, South Korea.
- 2017 **Crouzeix's conjecture**, July 31 to August 4, 2017, American Institute of Mathematics, San Jose, California, USA.
- 2017 **International Linear Algebra Society (ILAS) meeting**, July 24-28, 2017, Iowa State University, Ames, Iowa, USA.
- 2017 **Spring Western AMS Sectional Meeting**, April 22-23, 2017, Washington state University, WA, USA.
- 2017 **University of Washington**, February, 23, 2017, University of Washington, Seattle, WA, USA.
- 2014 3th—**Algebra day**, 30 October, 2014, Isfahan Mathematics House, Iran.
- 2014 **12th Workshop on Numerical Ranges and Radii**, 28 July-1 August, 2014, Sanya, China.
- 2014 **Workshop on Matrices and Operators**, 24-27 July, 2014, Hainan, China.
- 2013 **Workshop on Matrix Geometries and Applications**, 1-12 July, 2013, Trieste, Italy.
- 2012 **Matrices and Operators Conference**, 27-30, Dec., 2012, Bangalore, India.
- 2012 **11th Workshop on Numerical Ranges and Radii**, 9-12 July, 2012, Kaohsiung, Taiwan.
- 2011 **6th Linear Algebra Workshop**, May 25-June 1, 2011, Kranjska Gora, Slovenia.
- 2009 **Summer School and Advanced Workshop on Trends and developments in Linear Algebra** June-10 July, 2009, Trieste, Italy.
- 2008 **5th Linear Algebra Workshop**, 27 May-5 June, 2008, Kranjska Gora, Slovenia.
- 2007 **South Eastern Analysis Meeting**, 9-11 March, 2007, Richmond, USA.
- 2006 **International Workshop on Matrix Analysis**, 15-17 Dec., 2006, Florida, USA.
- 2006 **College of William and Mary**, 17, November, 2006, Williamsburg, USA.
- 2006 **8th Workshop on Numerical Ranges and Radii**, 15-16 July, 2006, Bremen, Germany.
- 2006 **International Linear Algebra Society (ILAS) meeting**, 18-21, July, 2006, Amsterdam, Netherland.

- 2005 **4th Linear Algebra Workshop** , 16-24 May, 2005, Bled, Slovenia.
- 2003 **MASSEE Conference** , 15-21 September, 2003, Sofia, Bulgaria.
- 2002 **6th Workshop on Numerical Ranges and Radii**, 10-13 June, 2002, AI., USA.
- 2001 **University of Toronto**, 14 November, 2001, Toronto, Canada, (colloquium.
- 2001 **Technische Universität Vienna**, 15 June, 2001, Vienna, Austria.
- 2000 **5th Workshop on Numerical Ranges and Radii**, 26-28 June, 2000, Nafplio, Greece.
- 1995 **Third International Congress on Industrial and Applied Mathematics**, 3-7 July, 1995, Hamburg, Germany.