



Amin RAFIEI

Curriculum Vitae

"When one door closes, another opens; but we often look so long and so regretfully upon the closed door that we do not see the one which has opened for us" - Alexander Graham Bell

Personal Information

Date of birth September 8, 1978

Place of birth Ahvaz, Iran

Education

2005–2009 **Ph.D.**, *Ferdowsi University of Mashhad, Iran, Department of Mathematics.*

- Title of Thesis: RIF-Ns and SAINV-Ns preconditioners
- Supervisor: Prof. Faezeh Toutounian

2002–2004 **M.Sc.**, *Ferdowsi University of Mashhad, Iran, Department of Mathematics.*

- Title of Thesis: Krylov subspace methods to solve large sparse Sylvester equation
- Supervisor: Prof. Faezeh Toutounian

1998–2002 **B.Sc.**, *Vali Asr University of Rafsanjan, Iran, Department of Mathematics.*

Research Interests

- Parallel, Scientific and CUDA Computing
- Numerical Linear Algebra
- Preconditioning Techniques
- Iterative Methods

Academic Positions

09/2009-08/2019 **Assistant Professor**, *Hakim Sabzevari University, Sabzevar, Iran.*

09/2019-Present **Associate Professor**, *Hakim Sabzevari University, Sabzevar, Iran.*

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Visiting Positions

- 2017 **Invited Professor**, *Laboratoire Analyse, Geometrie et Applications*, Paris 13 University, France.
○ Amount of fund: 4030€

Research Grants

- 2007-2008 **Exchange Ph.D. student**, *Institute Computational Mathematics*, Technische Universität Braunschweig, Germany.
○ Supervisor: Prof. Matthias Bollhoefer
○ Amount of fund: 10.800€
- 2015 **Abel Visiting Scholarship**, *Institute Computational Mathematics*, Technische Universität Braunschweig, Germany.
○ Supervisor: Prof. Matthias Bollhoefer
○ Amount of fund: 5000\$ + 1500€
- 2017-2018 **Postdoc Researcher**, *INRIA research centre of Paris*, France.
○ Supervisor: Prof. Laura Grigori
○ Amount of fund: 10.200€

Honors

- 2002 **Top-ranked B.Sc. student**, *Vali Asr University of Rafsanjan*, Iran.
2002 **Second rank**, *Entrance Examination of M.Sc. level in Iran*.
2004 **Top-ranked M.Sc. student**, *Ferdowsi University of Mashhad*, Iran.
2004 **10th rank**, *International Scientific Olympiad of University Students held in Iran*.
2005 **Highest ranked**, *Entrance Examination of Ph.D. degree*, Ferdowsi University of Mashhad, Iran.

Teaching Experiences

Undergraduate Courses

- 2009-Present ○ Numerical analysis 1 and 2
○ Calculus 1, 2 and 3
○ Linear algebra
○ Numerical Linear Algebra

Graduate Courses

- 2009-Present ○ Numerical Methods in Linear Algebra
○ Advanced Numerical Computations
○ Advances in Numerical Analysis
○ Introduction to Parallel Computing
○ Introduction to Integral Equations
○ Approximation Theory

Students

Supervisor of M.Sc. students:

- 2010-2011 **Fatemeh Shahlaei**.

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2011-2012 **Elham Moradian.**
2011-2012 **Azam Zare.**
2010-2013 **Mohammad Hossein Norouzi.**
2012-2013 **Toktam Hossein Nezhad.**
2012-2013 **Shayesteh Tavassoli.**
2013-2014 **Mahdi Mohseni.**
2014-2015 **Fatemeh Hasan Abadi.**
2014-2015 **Fatemeh Rezaei Fazel.**
2015-2016 **Haniyeh Fereydoonfar.**
2015-2016 **Motahareh Ravanan.**
2015-2016 **Soroor Matoori.**
2015-2016 **Zeynab Borhani.**
2016-2017 **Samaneh HosseiniSani.**
2016-2017 **Leila Kakhki Beydokhti.**
2016-2017 **Haniyeh Radjabi.**
2016-2017 **Somayyeh HokmAbadi.**
2016-2017 **Javad Sharif Pirani.**
2017-2018 **Zohreh Shahr Aeni.**
2016-2018 **Masoumeh Yadegari.**
2018-2019 **Akram Mohammadian.**

Advisor of M.Sc. students:

2010 **Mohsen Mosayyebi.**
2010 **Akram Nosratipour.**
2011 **Salimeh Khani.**
2011 **Effat Razeghi.**
2012 **Parvin Baghaei Shahraki.**
2012 **Raheleh Hasan Abadi.**
2013 **Elaheh Hashem Abadi.**
2013 **Majid AboutalenZadeh.**
2013 **Hamid Abbasi.**
2016 **Amineh Izi.**
2016 **Zeynab Barmalzan.**
2016 **Elham Akraminia.**
2016 **Somayyeh PourSedigh.**
2016 **Mostafa Mousavi Moghaddam.**
2016 **Zeynab Beyranvand.**
2016 **Afsaneh Abedini.**
2017 **Mohammad Javad Maleki.**
2017 **Elham Tashakkori.**

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2017 **Ehsan AhmadZadeh.**
2017 **Bahareh Koushki.**
2018 **Elham Sanchouli.**
2018 **Fatemeh Anaraki.**
2018 **Mahboubeh Bakhsh Ali.**
2018 **Ahmad Ramshini.**
2019 **Reza Boroghani.**

Journal Papers

1. Azizizadeh, N., Tajaddini, A., **Rafiei, A.**, *Implicitly restarted global Krylov subspace methods for matrix equations $AXB = C$* , Mathematical Sciences, (2023), <https://doi.org/10.1007/s40096-023-00516-1>.
2. **Rafiei, A.**, Tolve Haghghi, B., *Computing a block incomplete LU preconditioner as the by-product of block left-looking A-biconjugation process*, Journal of New Researches in Mathematics, in Persian, 5(18), 49-64 (2019)
3. **Rafiei, A.**, Bollhoefer, M., Benkhaldoun, F., *A block version of left-looking AINV preconditioner with one by one or two by two block pivots*. Applied Mathematics and Computations, 350, 366-385 (2019) (ISI)
4. **Rafiei, A.**, Bollhöfer, M., *Complete pivoting strategy for the IUL preconditioner obtained from Backward Factored APproximate INVerse process*. Bulletin of the Iranian Mathematical Society, 43(5), 1417 – 1456 (2017) (ISI)
5. Khojasteh, D., **Rafiei, A.**, Roohani, H., *ILU Preconditioning Based on the FAPINV Algorithm*. Opuscula Mathematica, 5(2), 235-250 (2015).
6. **Rafiei, A.**, Tolve, B., Bollhoefer, M., *Complete Pivoting strategy for the Left-looking Robust Incomplete Factorization preconditioner*. Computers and Mathematics with applications, 67(11), 2055–2070 (2014).(ISI)
7. **Rafiei, A.**, *Left-looking version of AINV preconditioner with complete pivoting strategy*. Linear Algebra and its Applications, 445, 103–126 (2014). (ISI)
8. **Rafiei, A.**, *ILU and IUL factorizations obtained from Forward and Backward Factored APproximate INVerse algorithm*, Bulletin of the Iranian Mathematical Society, 40(5), 1327–1346 (2014). (ISI)
9. **Rafiei, A.**, *A complete pivoting strategy for the right-looking Robust Incomplete Factorization preconditioner*. Computers and Mathematics with applications, 64, 2682–2694 (2012). (ISI)
10. **Rafiei, A.**, Shahlaei, F., *Different versions of ILU and IUL Factorizations obtained from Forward and Backward Factored Approximate Inverse Processes- Part I*. Advances in Numerical Analysis, Volume 2011, Article ID: 703435, 9 pages.
11. **Rafiei, A.**, *A hybrid preconditioner to solve nonsymmetric linear system of equations*, Journal of Advanced Research in Scientific Computing, 3(4), 57–97 (2011).
12. **Rafiei, A.**, Bollhöfer, M.: *Robust Incomplete Factorization for Nonsymmetric matrices*. Numerische Mathematik, 118(2), 247–269 (2011). (ISI)
13. **Rafiei, A.**, Toutounian, F.: *Breakdown-free version of ILU factorization for nonsymmetric positive definite matrices*. Journal of Computational and Applied Mathematics, 230, 699–705 (2009). (ISI)
14. **Rafiei, A.**, Toutounian, F.: *New breakdown-free variant of AINV method for nonsymmetric positive definite matrices*. Journal of Computational and Applied Mathematics, 219(1), 72–80
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(2008). (ISI)

Conference Papers

1. **Rafiei, A.**, *A nonsymmetric approximate inverse preconditioner with block structure*. The International Conference on Preconditioning Techniques for Scientific and Industrial Applications, July 31- August 2, 2017. Canada. (Participation cancelled because of a latency in visa application).
2. **Rafiei, A.**, Kakhki Beydokhti, L., *Right-looking approximate*, 47th Annual Iranian Mathematics Conference, August 22-25, 2017, Bu Ali Sina University, Hamedan, Iran.
3. **Rafiei, A.**, Kakhki Beydokhti, L., *A block version of right-looking A-biconjugation process*. 9th Seminar on linear algebra and its applications, July 5-6, 2017, Tabriz University, Iran.
4. **Rafiei, A.**, Hosseini Sani, S., *Left-looking AINV preconditioner in block form*. 9th Seminar on linear algebra and its applications, July 5-6, 2017, Tabriz University, Iran.
5. **Rafiei, A.**, Bollhoefer, M., and Huckle, T., *A block factorization format for the inverse of a nonsymmetric matrix*. 47th Annual Iranian Mathematics Conference, 28-31 August 2016, Kharazmi University, Iran.
6. **Rafiei, A.**, Bollhoefer, M., *Extending the pivoting strategy of Backward IJK version of Gaussian Elimination to an IUL preconditioner*. The International Conference on Preconditioning Techniques for Scientific and Industrial Applications, June 17-19, 2015, Eindhoven, The Netherlands.
7. **Rafiei, A.**, Bollhoefer, M., *Pivoting strategy for the right-looking version of RIF – N_s preconditioner*. GAMM workshop, Applied and Numerical Linear Algebra 2015, July 9-10, 2015, Magdeburg, Germany.
8. **Rafiei, A.**, Rezaei, F., *Complete pivoting strategy to compute the IULBF preconditioner*. 46th Annual Iranian Mathematics Conference, 25-28 August 2015, Yazd University, Iran.
9. **Rafiei, A.**, Mohseni, M. and Rezaei, F., *Pivoting strategy for an ILU preconditioner*. 46th Annual Iranian Mathematics Conference, 25-28 August 2015, Yazd University, Iran.
10. **Rafiei, A.**, *Left-looking version of RIF preconditioner with complete pivoting strategy*, The 7th Seminar on Linear Algebra and its Applications, 26-27th February 2014, Ferdowsi University of Mashhad, Iran.
11. **Rafiei, A.**, Azadi, M., *Solving the Sylvester matrix equation by the Global Transpose-Free Quasi-Minimal Residual Method*, 44th Annual Iranian Mathematics Conference, 27-30 August 2013, Ferdowsi University of Mashhad, Iran. (Accepted as a Poster)
12. **Rafiei, A.**, Moradian, E., *Complete pivoting strategy for the left-looking version of AINV preconditioner*, 44th Annual Iranian Mathematics Conference, 27-30 August 2013, Ferdowsi University of Mashhad, Iran.
13. Zare, A., **Rafiei, A.**, *Right-looking version of robust incomplete factorization preconditioner with pivoting*, 43rd Annual Iranian Mathematics Conference, 27-30 August 2012, University of Tabriz, Iran. (Accepted as a Poster)
14. Shahlaei, F., **Rafiei, A.**, *Different dropping strategies in the ILUFF algorithm*, 42nd Annual Iranian Mathematics Conference, 5-8 September 2011, Vali-e-Asr University of Rafsanjan, Iran.
15. Shahlaei, F., **Rafiei, A.**, *Computing the ILU decomposition as by-product of the Backward Factored AProximate INVerse process*, 6th International Seminar on Linear Algebra and its applications. 5-6 June 2011, Arak University, Iran. (In Persian)
16. **Rafiei, A.**, *Efficient dropping technique for ILU and IUL factorizations obtained as by-products of FFAPINV and BFAPINV algorithms*. International Conference on Preconditioning Techniques For Scientific And Industrial Applications. May 16-18, 2011. Bordeaux, France. (participation cancelled).

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Workshops

- 2014 **Computing packages for Numerical Linear Algebra**, *Shahid Bahonar University of Kerman*, Iran.
- 2014 **Application of Group theory in Cardiography**, *Ferdowsi University of Mashhad*, Iran.
- 2015 **GAMM workshop – applied and numerical linear algebra**, *Max Planck Institute for Dynamics of Complex Technical Systems*, Magdeburg, Germany.
- 2016 **Workshop on optimization and its application in Medicine**, *Institute for Research in Fundamental Sciences*, Tehran, Iran.
- 2016 **Parallel computing workshop**, *Kharazmi University*, Karaj, Iran.
- 2017 **Mathematical Modeling and Scientific Computing**, *Hakim Sabzevari University*, Sabzevar, Iran.

Academic References

- Prof. Matthias Bollhoefer. Technische Universitat Braunschweig, Germany (m.bollhoefer@tu-bs.de)
- Prof. Fred Wubs. University of Groningen, The Netherlands (f.w.wubs@rug.nl)
- Prof. Fayssal Benkhaldoun. Paris 13 University, France. (fayssal@math.univ-paris13.fr)
- Prof. Davoud Khojasteh . Guilan University, Iran. (khojasteh@guilan.ac.ir)

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