

Ali Akbar Arefijamaal

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Curriculum Vitae

Scientific Interests:

I am Ali Akbar, a Persian mathematician, born in 1971 in Mashhad, Iran. My research interests and experiences consist of a wide range between pure mathematics (Abstract Harmonic Analysis, Representation & Operator Theory) and applied mathematics (Mathematical Physics & Coherent States).

I am particularly interested in frame theory (Gabor & wavelet frames, p-frames, g-frames, K-frames, fusion frames). My approaches are concentrated on the duality of a wide range of frames.

I have employed as an academic staff in the Hakim Sabzevari University since 1997.

Education

1995	B.Sc. , Pure Mathematics, Birjand University, Birjand, Iran, 1995
1997	M.Sc. , Pure Mathematics, (Differential equations) Sharif University of Technology, Tehran, Iran, 1997 Supervisor: Prof. Mahmood Hesaraki.
2006	Mathematical Analysis (Harmonic and Wavelet Analysis) Ferdowsi University of Mashhad, Mashhad, Iran, Supervisor: Prof. Rajab Ali Kamyabi-Gol.

Visited Institute and Research Centers.

2004	The center of excellence in analysis on algebraic structures. Ferdowsi University of Mashhad
2005	Department of mathematics and statistics, Concordia University, Montreal, Canada
2011	Numerical harmonic analysis group (NuHAG), University of Vienna, Vienna, Austria Acoustics Research Institute (OeAW), Vienna University of Technology, Vienna, Austria
2019	

Supervision

2016	Fahimeh Arabyani, "On the duality of wavelet and Fusion frames"
2017	Mitra Shamsabadi, "Fusion frames and K-frames, their multipliers and Gram matrices"
2019	Atefe Razghandi, "Duality of continuous frames, representation frames and wave packet frames"
2020(now)	Elaheh Agheshte Moghaddam, "Weaving Frames and their duality"

Publications

A: Scientific Papers Published in Journals

- 1- **A. A. Arefijamaal**, A. Safapour, and R. A. Kamyabi-Gol, A property of the Haar measure of some special LCA, J. Sci. Islam. Repub. Iran 17(3), (2006) 245-248.
- 2- **A. A. Arefijamaal** and R. A. Kamyabi-Gol, A Characterization of square integrable representations associated with CWT, J. Sci. Islam. Repub. Iran 18 (2), (2007) 159-166.
- 3- **A. A. Arefijamaal** and R. A. Kamyabi-Gol, On the square integrability of quasi regular representation on semidirect product groups, J. Geom. Anal. 19 (3), (2009) 541-552.
- 4- **A. A. Arefijamaal** and R.A. Kamyabi-Gol, On construction of coherent states associated with semidirect products, Int. J. Wavelets Multires. Inform. Proc. 6 (5), (2008) 749-759.
- 5- **A. A. Arefijamaal**, On construction of coherent states associated with homogeneous spaces, Turk. J. Math. 34, (2010) 515-521.
- 6- A. Ghiami Bajgirani, M. B. Sharifi, M. F. Maghrebi and **A. A. Arefijamaal**, Applying Fourier and wavelet transform to extract instantaneous unit hydrograph. Iran-Water Resou. Rese. 6 (2), (2010) 27-35.
- 7- A. Ghiami Bajgirani, M. B. Sharifi, M. F. Maghrebi and **A. A. Arefijamaal**, Using of spectral estimations for determinations of smoothed unit hydrograph. J. Civil Engineering, 21(2), (2010) 101-110.
- 8- **A. A. Arefijamaal** and N. Tavallaei, Continuous frame wavelets, Acta Mathematica Scientia. 32B(2), (2012) 807–812.
- 9- **A. A. Arefijamaal** and Gh. Sadeghi, von Neumann-Schatten frames in separable Banach spaces, Mediterranean J. of Mathematics 9, (2012) 525-535.
- 10- **A. A. Arefijamaal** and Gh. Sadeghi, Approximation of reconstruction formula for continuous wavelet and Weyl-Heisenberg frames, Journal of Nonlinear Analysis and Application, vol 2012, (2012) 1-11.
- 11- **A. A. Arefijamaal** and S. Ghasemi, On characterization and stability of alternate dual of g-frames, Turk. J. Math. 37, (2013) 71-79.
- 12- **A. A. Arefijamaal**, The continuous Zak transform and generalized Gabor frames, Mediterr. J. Math. 10, (2013) 353-365.
- 13- **A. A. Arefijamaal** and Gh. Sadeghi, Frames in 2-inner product spaces, **Iranian Journal of Mathematical Sciences and Informatics** 8(2), (2013) 123-130.
- 14- **A. A. Arefijamaal**, R.A. Kamyabi-Gol, R. Raisi Tousi and N. Tavallaei, A new approach to continuous Riesz bases, J. Sci. I. R. Iran 24(1), (2013) 63-69.
- 15- **A. A. Arefijamaal**, L. Mohammadkhani, On dual of p-frames, Involve, 6(3), (2013) 301- 309.

- 16- **A. A. Arefijamaal** , E. Zekae, Signal processing by alternate dual Gabor frames, App. Comput. Harmon. Anal. 35, (2013) 535-540.
- 17 - **A. A. Arefijamaal** and Arash Ghaani Farashahi, Zak transform for semidirect product of locally compact groups, Anal. Math. Phys. 3, (2013) 263-276.
- 18- **A. A. Arefijamaal** , Stability of Alternate dual frames, Romanian J. Math. Computer Science, 3(2), (2013) 140-145.
- 19- Gh. Sadeghi, **A. Arefijamaal**, E. Zekae, Construction of all topologies and algebras on finite sets, Acta Universitatis Apulensis, 41, (2015) 1-9.
- 20- **A. A. Arefijamaal**, M. Mohammadzadeh Karizaki, A generalization of the Calderon admissibility condition, Eur. J. Pure Appl. Math. 8(3), (2015) 368-374.
- 21- **A. Arefijamaal**, Fahimeh Arabyani, A Tensor Product Approach to the Abstract Partial Fourier Transforms over Semi-direct Product Groups, Sahand Communications in Mathematical Analysis, 2, (2015) 78-31.
- 22- **A. Arefijamaal**, E. Zekae, Image processing by alternate dual Gabor frames, Bull. Iranian Math. Soc., 42.(2016) 1305-1314 .
- 23- **A. A. Arefijamaal**, Gh. Sadeghi, von Neumann-Schatten dual frames and their perturbations, Results. Math., 69, (2016) 431–441.
- 24- F. Arabyani Neyshaburi, **A. Arefijamaal**, Some constructions of K-frames and their duals, Rocky Mountain. J. Math. 47(6), (2017) 1749-1764.
- 25- E. Osgooei and **A. A. Arefijamaal**, Compares and contrasts between duals of fusion and discrete frames, Sahand Communications in Mathematical Analysis, 8(1), (2017) 83-96.
- 26- **A. A. Arefijamaal**, Mitra Shamsabadi, The invertibility of fusion frame multipliers. Linear Multilinear Algebra, 65(5), (2017) 1062–1072.
- 27- **A. A. Arefijamaal**, F. Arabyani Neyshaburi, Some properties of dual and approximate dual of fusion frames, Turkish J. Math. 41(5), (2017) 1191-1203.
- 28- **A. A. Arefijamaal**, Fahimeh Arabyani and Mitra Shamsabadi, On the duality of frames and fusion frames, Hacet. J. Math. 47 (1) (2018), 47 – 56.
- 29- **A. A. Arefijamaal**, Fahimeh Arabyani and Samaneh Matindoost, Construction dual wavelet frame pairs and signal recovery, SeMA, 76, (2019) 27-36.
- 30- F. Arabyani Neyshaburi, **A. Arefijamaal**, Characterization and construction of K-fusion frames and their duals in Hilbert spaces, Results Math. (2018) 73: 47.
- 31- Fahimeh Arabyani, **A. A. Arefijamaal and Ghadir Sadeghi**, Extreme points and identification of optimal alternate dual frames. Linear Algebra and its Applications 549 (2018) 123–135.

- 32- E. Osgooei and **A. A. Arefijamaal**, Compares and contrasts between duals of fusion and discrete frames , Sahand Communications in Mathematical Analysis (SCMA) 8(1) (2017), 83-96.
- 33- **A. A. Arefijamaal**, Mitra Shamsabadi, *O*-Cross Gram matrices with respect to *g*-frames. Arab. J. Math. (2019).
- 34- P. Balazs, M. Shamsabadi, **A. A. Arefijamaal**, A. Rahimi, *U*-cross Gram matrices and their invertibility. J. Math. Anal. Appl. 476 (2019), 367–390
- 35- Fahimeh Arabyani, **A. A. Arefijamaal**, Some equalities and inequalities for *K*-fusion frames, Wavelets and Linear algebra, 5(3) 2019, 27-38 (in persian).
- 36- Mitra Shamsabadi, **A. A. Arefijamaal**, On *C*-*D* controlled frames and their duality, Linear Multilinear Algebra, 69(9) (2021), 1761–1770 .
- 37- A. Razghandi **A. A. Arefijamaal**, On the characterization of generalized dual frames, U.P.B. Sci. Bull., Series A, 82(1) (2020), 161-170.
- 38- **A. A. Arefijamaal**, Atefeh Razghandi, Characterization of representation frames based on some dilation groups, Sahand Communications in Mathematical Analysis (SCMA), 17 (3) (2020), 93-106
- 39- **A. A. Arefijamaal**, Atefeh Razghandi, Characterization of alternate duals of continuous frames and representation frames, Results Math. 74(4) :191 (2019), 1-17.
- 40- Fahimeh Arabyani, **A. A. Arefijamaal**, Weaving Hilbert Space Fusion Frames, to appear in Rocky Mountain. J. Math. 51(1) (2021), 55–66.
- 41- **A. A. Arefijamaal**, Atefeh Razghandi, Existence of representation frames based on wave packet groups, Hacet. J. Math. Stat. 49(5) (2020), 1825-1842.
- 42- F. Arabyani, **A. A. Arefijamaal**, Manufacturing pairs of woven frames applying duality principle on Hilbert spaces, Bull. Malays. Math. Sci. Soc. 44(1) (2020), 147--161.
- 43- Mitra Shamsabadi , **A. A. Arefijamaal**, Some results of *K*-frames and their multipliers, Turk. J. Math. 44 (2020), 538 – 552
- 44- M. Shamsabadi, P. Balazs, **A. A. Arefijamaal**, The invertibility of *U*-fusion cross Gram matrices of operators. Mediterr. J. Math. 17(4) , 130 (2020), <https://doi.org/10.1007/s00009-020-01536-0>
- 45- M. Shamsabadi, **A. A. Arefijamaal**, Gh. Sadeghi, Duals and multipliers of *K*-fusion frames, J. Pseudo-Differ. Oper. Appl. 11 (2020), 1621–1633.
- 46- F. Arabyani, **A. A. Arefijamaal**, Gh. Sadeghi, Numerically and Spectrally Optimal Dual Frames in Hilbert Spaces. Linear Algebra and its Applications 604 (2020), 52–71.
- 47- M. Shamsabadi, **A. A. Arefijamaal**, Some results on *U*-cross Gram matrices by using *K*-frames, Afrika Matematika, 31 (2020), 1349–1358.

- 48- M. Mahmoudieh, Gh. Abbaspour Tabadkan, **A. A. Arefijamaal**, Sum of K-frames in Hilbert C^* -modules, Filomat 34(6) (2020), 1771–1780.
- 49- E. Agheshteh Moghaddam, **A. A. Arefijamaal**, On Excesses and duality in woven frames, Bull. Malays. Math. Sci. Soc. 44 (5) (2021), 3361--3361.

B: Scientific Papers Submitted in Journals

- 1- E. Agheshteh Moghaddam, **A. A. Arefijamaal**, Woven K-frames, the duality and excess
- 2- **A. A. Arefijamaal**, Atefeh Razghandi, On the duality of weighted controlled continuous Frames
- 3- A. Razghandi **A. A. Arefijamaal**, On the duality of continuous K-g-frames,
- 4- F. Arabyani, **A. A. Arefijamaal**, Optimal reconstruction against erasures by using dual fusion frames.
- 5- H. Javanshiri, M. Abolghasemi, **A. Arefijamaal**, The essence of invertible frame multipliers in scalability,
- 6- P. Balazs, M. Shamsabadi, **A. Arefijamaal**, G. Chardon Representation of Operators Using Fusion Frames.

C. Scientific Paper Presented in Conferences

1. **A. A. Arefijamaal**, “Admissible and Weakly Admissible Groups”, Millennum University, Dhaka, Bangladesh ,2005.
2. **A. A. Arefijamaal**, “Coherent states from a general semi direct product group”, 16th Seminar on Math. Anal. Appl., Ferdowsi University, Mashhad, Iran, 5 Feb. 2007.
3. **A. A. Arefijamaal**, “Wavelets and Reconstruction of Images”, Workshop of wavelets and applications, Ferdowsi University, Mashhad, Iran, 22 Feb. 2007.
4. **A. A. Arefijamaal**, “Wavelets in Matlab”, Applications of wavelets in Statistics, Ferdowsi University, Mashhad, Iran, 1 March. 2007.
5. **A. A. Arefijamaal**, “On construction of coherent states associated with homogenous spaces”, 2nd International Conference on Mathematics & Statistics, Athens, Greece, 16 June 2008.
6. **A. A. Arefijamaal**, “Generalized continuous wavelet transform”, 39th annual Iranian mathematics conference, Shahid Bahonar university of Kermane, Kerman, Iran, 25 Aug. 2008.
7. **A. A. Arefijamaal**, Z. Molaa akbari and N. Ramezanzade “Perturbation of discrete and continuous frames”, 40th annual Iranian mathematics conference, Sharif University of Technology, Tehran, Iran, 20 Aug. 2009.
8. **A. A. Arefijamaal**, “A Generalization of Calderon admissibility condition”, Workshop of matrix analysis, frames and wavelets theory, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran, , 2 Feb. 2010.
9. **A. A. Arefijamaal**, “Edge detections using tight wavelet frames”, Third international conference of mathematics, Aleppo University, Syria, 15 Dec 2010.
10. **A. A. Arefijamaal**, “Using Continuous Zak Transform to Construct Generalized Gabor Frames for $L^2(G)$ ”, From abstract to computational harmonic analysis, Vienna University, Stroble, Austria, 13 June 2011.
11. **A. A. Arefijamaal**, L. Mohammadkhani “On the dual of p-frames”, 42th annual Iranian mathematics conference, Vali-e-Asr University of Rafsanjan, Rafsanjan , Iran, 6 Sep. 2011.
12. **A. A. Arefijamaal**, E. Zekae “Signal and image processing by alternate dual Gabor frames,” Seminar on Banach spaces and Banach algebras, Damghan University, Damghan, Iran, 23 Jan. 2011.

13. **A. A. Arefijamaal**, E. Zekae “An infinite number of dual Gabor frames and some applications,” 1st Seminar on Harmonic analysis and applications, Isfahan University of Technology, Isfahan, Iran, 23 Jan. 2013.
14. **A. A. Arefijamaal** “Some results on semidirect product groups,” 3th Seminar Wavelets and its applications, Ferdowsi University, Mashhad, Iran, 2 May. 2013.
15. **A. A. Arefijamaal**, F. Arabyani “On the dual of some semidirect product groups”, 44th annual Iranian mathematics conference, Ferdowsi University of Mashhad, Mashhad, Iran, 27-30 Aug. 2013.
16. F. Arabyani **A. A. Arefijamaal**, M. Mohsenipour, Gh. Sadeghi “Continuous frame associated with vector measures”, 44th annual Iranian mathematics conference, Ferdowsi University of Mashhad, Mashhad, Iran, 27-30 Aug. 2013.
17. **A. A. Arefijamaal**, F. Arabyani, “Opposite relationships between a frame and its dual frame”, International conference on advances in applied mathematics and mathematical physics, Yildiz Technical University, Istanbul, Turkey, 19-21 Aug. 2014.
18. **A. A. Arefijamaal**, F. Arabyani, “On the duality of wavelet frame”, 45th annual Iranian mathematics conference, Semnan University, Semnan, Iran, 26-29 Aug. 2014.
19. **A. A. Arefijamaal**, F. Arabyani, “Constructing dual and approximate dual fusion frames”, 46th annual Iranian mathematics conference, Yazd University, Yazd, Iran, 25-28 Aug. 2015.
20. **A. A. Arefijamaal**, M. Shamsabadi, “Fusion Riesz Bases”, 46th annual Iranian mathematics conference, Yazd University, Yazd, Iran, 25-28 Aug. 2015.
21. M. Shamsabadi, **A. A. Arefijamaal**, “Fusion frame multipliers,” 4st Seminar on Harmonic analysis and applications, Kharazmi University, Tehran, Iran, 20-21 Jan. 2016.
22. **A. A. Arefijamaal**, F. Arabyani, “Stability of approximate dual fusion frames in Hilbert spaces,” 4st Seminar on Harmonic analysis and applications, Kharazmi University, Tehran, Iran, 20-21 Jan. 2016.
23. A. Razghandi, **A. A. Arefijamaal**, “On the continuous wave packet frames,” 5st Seminar on Harmonic analysis and applications, Ferdowsi University of Mashhad, Mashhad, Iran, 18-19 Jan. 2017.
24. M. Shamsabadi, **A. A. Arefijamaal**, “U-cross Gram matrixes and their associated reconstructions,” 5st Seminar on Harmonic analysis and applications, Ferdowsi University of Mashhad, Mashhad, Iran, 18-19 Jan. 2017.
25. A. Razghandi, **A. A. Arefijamaal**, “On the duality of continuous frames based on wave packet groups,” 6st Seminar on Harmonic analysis and applications, Hakim Sabzevari University, Sabzevar, Iran, Jan 31 - Feb 1, 2018.
26. F. Arabyani, **A. A. Arefijamaal**, “An introduction to weaving Hilbert space frames,” The 4th Seminar on Operator Theory and its Applications 7-8 March 2018, University of Bojnord, Iran.
27. F. Arabyani, **A. A. Arefijamaal**, Gh. Sadeghi “Optimal dual frames in Hilbert spaces,” 7st Seminar on Harmonic analysis and applications, Shahid Beheshti University, Tehran, Iran, Jan 17 - 18, 2019.
28. A. Razghandi, **A. A. Arefijamaal**, “On the representation frames and duality,” 7st Seminar on Harmonic analysis and applications, Shahid Beheshti University, Tehran, Iran, Jan 17 - 18, 2019.

29. M. Shamsabadi **A. A. Arefijamaal**, P. Balazs, "The invertibility of U-fusion cross Gram matrices of operators," 14th **International Conference on Mathematical and Numerical Aspects of Wave Propagation**, University of Technology, Vienna, Austria, 25. - 30. August 2019.

30. P. Balazs, M. Shamsabadi **A. A. Arefijamaal**, "U-cross Gram matrices and their invertibility," 14th **International Conference on Mathematical and Numerical Aspects of Wave Propagation**, Vienna University of Technology, Vienna, Austria, 25. - 30. August 2019.

31- E. Agheshteh Moghaddam, **A. A. Arefijamaal**, "Woven Frames and Their Duality," 6st Seminar on Functional Analysis and its Applications, University of Isfahan, January 27-28, 2021.

D. Books

1. **A. A. Arefijamaal**, "Advance Math Software; Mathcad", Negin Kavir, Sabzevar, 2002. (in Persian).
2. M. Janfada **and A. A. Arefijamaal**, Real Analysis With An Introduction To Wavelets And Applications, by D. Hong, J. Wang and R. Gardner. 2010. (Translated to Persian)

Masters Students Advised

- 1- S. Mohammadi, "Frames and exponential frames", 2008.
- 2- M. Mohammadzade, "Characterization of admissible subgroups of $GL(n, \mathbb{R})$ associated to CWT", 2008.
- 3- J. Farrokhi, "Gabor frames and relation to qualitative uncertainty principle", 2009.
- 4- Z. Bazobandi, "Continuous wavelet transform and square integrable representations", 2008.
- 5- L. Limoei, "Orthonormal wavelets and tight frames with arbitrary real dilations", 2009.
- 6- Z. Mollaakbari, "Continuous frames", 2009.
- 7- N. Ramezanzade, "Perturbations in frames", 2009.
- 8- M. Damanpak, "Wavelet frames and wavelet frame sets", 2010.
- 9- M. Shamsabadi, "A non-MRA C^r frame wavelet", 2010.
- 10- N. Farmanbar, "On the dimension functions of MRA tight frame wavelets", 2010.
- 11- M. Akbari, "Compactness and edge detection of image by frames and wavelets", 2010.
- 12- F. Ensan, "Approximation of the inverse frame operator", 2010.
- 13- M. Mohammadkhani, "p-frames in separable Banach spaces", 2011.
- 14- S. Ghasemi, "G-frames and G-Riesz", 2011.
- 15- M. Shayan, "Characterization of alternative dual for Gabor frames", 2012.
- 16- E. Haghighatjoo, "On the duals of wavelet frames", 2012.
- 17- E. Hoseinpour, "On the dual and perturbation of fusion frames", 2013.
- 18- M. Roodsarabi, "Explicitly given pairs of dual Gabor frames", 2013.
- 19- H. Zakei, "Lp-conjecture on locally compact group and homogenous spaces", 2013.
- 20- M. Ghoddosi, "On some identities and inequalities for frames in Hilbert spaces", 2014.
- 21- M. Seyyedi, "On the duality principle of frames in Hilbert space", 2014.
- 22- H. Ebrahiminejad, "Sampling theory in terms of Riesz and wavelet bases", 2015.
- 23- Esmaeel Zekaei, "Wavelets on graphs via spectral graph theory", 2015.
- 24- A. Zahedi, "Framelet-based image inpainting and data recovery", 2016.
- 25- F. Attaran, "On existence and construction finite tight frames", 2016.
- 26- A. Delavari, "Generalized Fourier Transform to Some Non-Abelian Locally Compact Groups", 2018.
- 27- A. Langari, "Function Approximation on locally compact group with positive definite functions", 2018.
- 28- H. Delfaraz, "On the excesses of some kinds of frames", 2019.
- 29- F. Akheshmeh, "A characterization of Gabor frame operators", 2019.

