Masoumeh Azghani

BIOGRAPHY
Place of birth: Tabriz, Iran.
Date of Birth: 23 June 1987.

CONTACT
Address: Electrical Engineering department, Sahand University of Technology, Tabriz, Iran
Email: mazghani@sut.ac.ir

EDUCATION
Sharif University of technology
Ph.D (with distinction), Sparse Signal Processing (2011-2014). GPA(18.37/20)
Thesis advisor: Prof. Farokh Marvasti
Thesis title: Efficient iterative sparse recovery techniques
Tabriz University
Msc. (with distinction), signal and Image Processing (2009-2011). GPA (18.98/20)
Thesis title: Video compression using compressed sensing theory
Bsc., electrical engineering (2005-2009) .GPA (17. 8/20)
Thesis title: motion detection in digital images

POSITIONS

Professor, Sahand University of Technology, Tabriz, Iran (March 2025-present)
Associate Professor, Sahand University of Technology, Tabriz, Iran (Dec 2019-March 2025)
Assistant Professor, Sahand University of Technology, Tabriz, Iran (Sep 2015-Dec 2019)
Visiting researcher, Institute for Inforcom. Research (I2R), A*Star, Singapore (Feb-Sep 2015).
Researcher, Multi-media Lab, Advanced Communication Research Institute (ACRI), Sharif University of Technology, Tehran, Iran (2011-2015).

HONORS
1st Rank in M.Sc., Electrical Engineering Department, Tabriz University, 2011.
2nd Rank in B.Sc., Electrical Engineering. Department, Tabriz University, 2009.
Ranked **11** in the Nationwide PhD Entrance Exam, Electrical Engineering (2011).
Ranked **49** in the Nationwide M.Sc. Entrance Exam, Electrical Engineering (2009).
Ranked **18** in Iranian Olympiad in Electrical Engineering (2008).
Ranked **665** in nationwide university Entrance Exam among more than 400,000 participants, Iran (2005).

RESEARCH INTERESTS

Array signal processing, (DOA estimation), massive MIMO systems, Radar systems, MIMO Radar, Cognitive MIMO Radar
Deep Learning and its applications in various fields
Wireless communications, (Channel equalization, beam forming, interference management, channel estimation, wireless information power transfer, cognitive radio systems, spectrum sensing, wireless localization)
Wireless sensor networks (distributed regression, sensor localization, adaptive graph signal estimation)
Compressed sensing, Sparse Signal Processing, Statistical Signal Processing, Dictionary Learning, Graph Signal Processing, Adaptive Signal Processing, Blind Source Separation.
 Image processing (object tracking, motion detection, super-resolution, forgery detection, compressed video sensing)
Biomedical imaging (microwave imaging)

PUBLICATIONS
Journal:

- **[1]** F. Moradlou, M. Safari, **M. Azghani, "** Inertial algorithms for equilibrium problems with applications to compressed sensing and image reconstruction, " Computational and Applied Mathematics, 2025.
- **[2]** O. A. Ghasemi, **M. Azghani**, M. C. Amirani , "The design of an RIS-assisted FDMA wireless sensor network for sum throughput maximization, " Computer Networks, 2025.
- **[3]** AAA. Kozehkonan, **M. Azghani** , "Secure multi tag multi antenna monostatic backscatter system based on time division multiple access, " AEU-International Journal of Electronics and Communications, 2025.
- **[4]** N Sadeghi, M Azghani, SA Mortazavi, "Joint Pilot Optimization and Channel Estimation Using Deep Learning in Massive," Digital Signal Processing, 2025.
- **[5]** V. Ansarian Nezhad, **M. Azghani**, and F. Marvasti "Compressed video sensing based on deep generative adversarial network" Circuits, Systems, and Signal Processing, vol. 43, 2024.
- **[6]** N. Maleki, **M. Azghani,** and N. Sadeghi, "Distributed adaptive thresholding graph recursive least squares algorithm" Circuits, Systems, and Signal Processing, vol. 43, 2024.
- **[7]** N. Sadeghi, and **M. Azghani**, "Deep learning based channel estimation in PLC systems " Annals of Telecommunications (2024): 1-10.

- **[8]** N. Kazemi, and **M. Azghani,** "Secure spectrum sharing and power allocation by multi agent reinforcement learning " Digital Signal Processing 146 (2024): 104369.
- **[9]** H. Oliaei, and **M. Azghani**, "Video motion forgery detection using motion residual and object tracking," Multimedia Tools and Applications 83.5 (2024): 12651-12668.
- **[10]** O. Ghasemi Abachian, M. Chehel Amirani, and **M. Azghani**, "Resource and power allocation for sum-throughput maximization in ris-assisted tdma wireless sensor networks," IEEE Internet of Things Journal (2024).
- **[11]** Z. Farzadpour, and **M. Azghani**, "Adaptive thresholding pattern for fingerprint forgery detection." Multimedia Tools and Applications 83.34 (2024): 81665-81683.
- **[12]** F. Rahimpour, and **M. Azghani**, "Semi-blind sparse channel estimation using regularized expectation maximization." Digital Signal Processing 153 (2024): 104630.
- **[13]** R. Sedghi, and **M. Azghani**, "IRS assisted anti jamming and beamforming technique," Physical Communication 67 (2024): 102519.
- **[14]** N. Sadeghi, and **M. Azghani**, "Deep learning-based massive MIMO channel estimation with reduced feedback", Digital Signal Processing 137 (2023): 104009.
- **[15]** N. Saliani, A. Pourziad, **M. Azghani** "Space-Time Electromagnetic Inverse Scattering Tomography of Objects With Affine Deformation," Transactions on Antennas and Propagation, vol.71, 2023.
- **[16]** R. Aghaie Abbasabad, and **M. Azghani**. "Distributed sparsity-based non-linear regression with multiple kernels in wireless sensor networks," Ad Hoc Networks 125 (2022): 102719.
- **[17]** Sadeghi, Nasser, and **M. Azghani**. "Massive MIMO Slow-varying Channel Estimation Using Tensor Sparsity," International Journal of Information and Communication Technology Research 13.1 (2021): 25-31.
- **[18]** Maleki, Nafiseh, and **M. Azghani**. "Sparse mixed norm adaptive filtering technique." Circuits, Systems, and Signal Processing 39 (2020): 5758-5775.
- **[19]** Sadeghi, Nasser, and **M. Azghani**. "Multi-user massive MIMO channel estimation using joint sparsity and non-ideal feedback modeling." Digital Signal Processing 100 (2020): 102640.
- **[20]** S. Abtahi, **M. Azghani**, F. Marvasti, "An Adaptive Iterative Thresholding Algorithm for Distributed MIMO Radars", IEEE Transactions on Aerospace and Electronic Systems, Vo. 55, No. 2, April 2019.
- **[21] M.Azghani**, S.Abtahi, F.Marvasti, "Simultaneous Block Iterative Method with Adaptive Thresholding for Cooperative Spectrum Sensing", IEEE Transactions on Vehicular Technology, Vo.64, No. 6, June 2019.

- **[22]** F. Afkhaminia, **M.Azghani**, "2-D Off-grid DOA Estimation Using Joint Sparsity", IET Radar, Sonar & Navigation, Vol. 13, No. 9, August 2019.
- **[23]** N.Sadeghi, **M.Azghani**, "Semi-Blind Channel Estimation based on subspace modeling for Multi-user Massive MIMO system", Journal of Nonlinear Systems in Electrical Engineering, Vol. 5, No. 2, 2018.
- **[24] M.Azghani**, A.Esmaeili, K.Behdin, and F.Marvasti, "Missing Low-Rank and Sparse Decomposition based on Smoothed Nuclear Norm", recently published in IEEE Transactions on Circuits and Systems for Video Technology.
- **[25]** Sedghi, Rana, and **M. Azghani**. "Interference suppression in heterogeneous massive MIMO systems with imperfect CSI." Telecommunication Systems 81.2 (2022): 323-332.
- **[26]** Sadeghi, Nasser, and **M. Azghani**. "Multi-user massive MIMO channel estimation using joint sparsity and non-ideal feedback modeling." Digital Signal Processing 100 (2020): 102640.
- **[27]** Afkhaminia, Fatemeh, and **M. Azghani**. "Sparsity-based DOA estimation of 2-D rectangular array in the presence of gain and phase uncertainty." Circuits, Systems, and Signal Processing 40.10 (2021): 5014-5032.
- **[28]** N. Maleki and **M. Azghani**, "Sparse Quasi-Newton Least Mean Mixed Norm Adaptive Filtering technique" under revision in IET Signal Processing.
- **[29]**] Hajialilu, Somayeh Fatan, **M. Azghani**, and Neda Kazemi. "Image copy-move forgery detection using sparse recovery and keypoint matching." IET Image Processing 14.12 (2020): 2799-2807.
- **[30] M. Azghani**, A. Ghorbani, and F. Marvasti. "Blind Iterative Non-linear Distortion Compensation Based on Thresholding." IEEE Transactions on Circuits and Systems II: Express Briefs, Vo. 64, No. 7, 2017.
- **[31] M.Azghani**, M.Karimi, F.Marvasti, "Multi-Hypothesis Compressed Video Sensing Technique" in IEEE Transactions on Circuits and Systems for Video Technology, Vo. 26, No. 4, 2016.
- **[32] M. Azghani** and F. Marvasti, "L2-Regularized Iterative Weighted Algorithm for Inverse Scattering," in IEEE Transactions on Antennas and Propagation, vol. 64, no. 6, pp. 2293-2300, June 2016.
- **[33] M.Azghani**, P.Kosmas, F.Marvasti, "Microwave Medical Imaging Based on Sparsity and an Iterative Method with Adaptive Thresholding," IEEE Transactions on Medical Imaging, vol.34, no.2, pp.357-365, Feb. 2015.
- **[34] M.Azghani**, P.Kosmas, F.Marvasti, "Fast Microwave Medical Imaging Based on Iterative Smoothed Adaptive Thresholding," Antennas and Wireless Propagation Letters, IEEE, vol.14, no., pp.438-441, 2015.

- **[35]** M. H. Khoozani, F. Marvasti, **M. Azghani**, M. Ghassemian, "Finding sub-optimum signature matrices for overloaded code division multiple access systems," IET Communications, vol.7, no.4, pp.295, 306, March 5 2013.

Book chapter:

- **[1]** M.Azghani, F.Marvasti," Sparse Signal Processing," published in the Applied and Numerical Harmonic Analysis Series (Springer-Verlag) under the title "New Perspectives on Approximation and Sampling Theory", 2014.

Conference:
- **[1]** Dust, Mohammad Rahbari, and **M. Azghani.** "Infrared Small Target Detection Based on Directional Mean Difference and Compactness." 2022 30th International Conference on Electrical Engineering (ICEE). IEEE, 2022.
- **[2]** Ghaderi, Elahe, and **M.Azghani.** "Improved Homtpopy Technique for MIMO signal Detection." 2022 30th International Conference on Electrical Engineering (ICEE). IEEE, 2022.
- **[3]** Sadeghi, Nasser, and **M. Azghani**. "Channel estimation using block sparse joint orthogonal matching pursuit in massive MIMO systems." 2021 26th International Computer Conference, Computer Society of Iran (CSICC). IEEE, 2021.
- **[4]** E. Mikaeli, A. Aghagolzadeh, **M. Azghani**, Single Image Super Resolution via Adaptive Group-Based Sparse Domain Selection, Iranian Conference on Electrical Engineering (ICEE), IEEE 2018/5/8.
- **[5]** A. Abtahi, **M. Azghani**, J. Tayefi and F. Marvasti, "Iterative block-sparse recovery method for distributed MIMO radar," Iran Workshop on Communication and Information Theory (IWCIT), Tehran, 2016, pp. 1-4.
- **[6]** **M.Azghani**, F.afkhaminia, "Sparsity-based Direction of Arrival Estimation in the Presence of Gain/Phase Uncertainty" presented in EUSIPCO, KOS 2017 (**invited talk**).
- **[7]** **M. Azghani**, F. Marvasti. "Iterative Least Squares Algorithm for Inverse Problem in Microwave Medical Imaging." EUSIPCO, Budapest, 2016. (**invited talk**)
- **[8]** **M. Azghani**, S. Sun, "Low-rank Block sparse decomposition algorithm for anomaly detection in networks," Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA), Hong Kong, 2015, pp. 807-810. (**invited talk**)

- **[9] M.Azghani** and F.Marvasti, "Microwave Imaging Based on Compressed Sensing," invited to give a **keynote speach** in URSI AT-RASC 2015.
- **[10] M.Azghani**, P.Kosams, F.Marvasti," Iterative Thresholding Techniques for Breast Tumor Microwave imaging," presented in European Conference on Antennas and Propagation 2014. (**invited talk)**
- **[11] M. Azghani**, F. Marvasti, "Iterative methods for random sampling recovery and compressed sensing recovery," presented in sampTA, Eurasip 2013.
- **[12] M. Azghani**, F. Marvasti, "Towards Optimization of Toeplitz Matrices for Compressed Sensing," presented in IWCIT, IEEE 2013.
- **[13]** F. Marvasti, **M. Azghani**, P. Imani, P. Pakrouh, S. J. Heydari, A. Golmohammadi, A. Kazerouni, M. M Khalili, "Sparse signal processing using iterative method with adaptive thresholding (IMAT), " 19th International Conference on Telecommunications (ICT), 2012. (**invited talk**)
- **[14] M. Azghani**, F. Marvasti, "Progressive Sparse Image Sensing using Iterative Methods," international symposium on telecommunications (IST) 2012.
- **[15]** S. Fattahi, **M. Azghani**, and F. Marvasti, "An Algorithm for Detecting the Exact Regions of Moving Objects in Video Frames," accepted in international symposium on telecommunications (IST) 2014.
- **[16] M. Azghani**, A. Aghagolzadeh, M. Aghagolzadeh, "compressed video sensing using adaptive sampling rate," 5th international symposium on telecommunications (IST) 2010.
- **[17] M. Azghani**, A. Aghagolzadeh, S. Ghaemi, M. kouzegar, "Intelligent modified mean shift tracking using genetic algorithm," 5th international symposium on telecommunications (IST) 2010.

Research and Industrial Projects:
- Three confidential projects (completed), to be announced upon request.
- Two confidential projects (ongoing), to be announced upon request.
- "Energy and bandwidth saving and increasing efficiency in wireless networks using compressed sensing" completed with Iran National Science Foundation (INSF).
- "Massive MIMO systems for 5G communication systems" on going with Niroo Research Institute (NRI).
- "Analog to Digital Converter using random sampling", completed with Sharif University of technology research and technology division.

- "Linear and Nonlinear distortion compensation" completed with Sahand University of technology research and technology division.
- "Massive MIMO channel estimation" completed with Sahand University of technology research and technology division.

Supervised Theses

1) Neda Kazemi, PhD thesis on "Secure spectrum sharing using deep learning".
2) Rana Sedghi, PhD thesis on "RIS assisted wireless system".
3) Nasser Sadeghi, PhD thesis on " Deep learning based MIMO channel estimation".
4) Abbasali Atarodi, PhD thesis (ongoing) on "Ambient Backscattering communication.
5) Farhad Mousavi, PhD thesis (ongoing) on " Cell free massive MIMO systems"
6) Mohamad Rahbari doost, PhD thesis (ongoing) on " Joint radar and wireless communication systems".
7) Reza Aghaie Abbasabad, PhD thesis (ongoing).
8) Ali Ahmadian Niazmand, PhD thesis (ongoing).
9) Fatemeh Afkhaminia, Master thesis on *"Direction of Arrival Estimation in Massive MIMO Systems"*.
10) Nasser Sadeghi Alishahi, Master thesis on *"Massive MIMO Channel Estimation"*.
11) Elhameh Mikaili, PhD thesis (coadvised with Prof.Aghagolzadeh) on *"Image* Super-resolution techniques".
12) Leila Gharedaghi, Master Thesis on *"Compressive Spectrum Sensing in Cognitive Radio"*.
13) Somayyeh Fattan, Master Thesis on *"Image Forgery Detection"*.
14) Nafiseh Maleki, Master Thesis on *"Sparse Adapive Filters"*.
15) Abbas ali atarodi, Master Thesis on *"Massive MIMO beamforming"*.
16) Rana Sedghi, Master Thesis on *"Interference mitigation in massive MIMO systems"*.
17) Haydeh Olyaii, Master Thesis on *"Video forgery detection"*.
18) Shamal Khayat, Master Thesis on *"mmwave massive MIMO channel estimation"*.

19) Hadi Hassanalizadeh, Master Thesis on *" Simultaneous Wireless Power Transfer techniques".*

20) Reza Aghaie, Master Thesis on "Distributed nonlinear regression techniques over wireless sensor networks".

21) Hadiss Farzadpoor, Master Thesis on "Fingerprint Forgery Detection".

22) Bakhtiari, Master Thesis on "DOA estimation of L-Shaped antenna arrays"

23) Ali Ahmadian niazmand , Master Thesis on "DSSS signals"

24) Farhad Mousavi , Master Thesis on "Deep learning based audio forgery detection"

25) Ata ebrahimpour, Master Thesis on "Infrared-visual image fusion using deep learning".

26) Fatemeh Rahimpour, Master Thesis on " Semi-blind MIMO channel estimation"

27) Hamed Esfahani, Master Thesis on " Joint TDOA-FDOA estimation"

28) Hanieh Sadid, Master Thesis on" Deep leaning based DOA estimation"

29) Mohammad Rahbaridoost, Master Thesis on "Joint Radar communication systems"

30) Negin fareji, Master Thesis on "Integrated sensing and communications"

31) Franak Mohammadian, Master Thesis on " Orthogonal Time Frequency Modulation".

TEACHING
Main Instructor
Radar Systems
Deep learning
Detection Theory
Blind Source Separation
Cellular Communications
Adaptive Filtering
Stochastic Processes
Convex Optimization
Numerical Optimization
C++ Programming

Signals and Systems
Digital Communications
Laboratory of Digital Communications

REFEREEING
IEEE Transactions on Information Theory
IEEE Transactions on Signal Processing
IEEE Transactions on Wireless Communications
IEEE Transactions on Image Processing
IEEE Journal of Selected Topics in Signal Processing
IEEE signal processing letter
IEEE Electronics Letters
IET Signal Processing
IET Computer Vision
Elsevier signal processing

GRADUATE COURSES
Taken (Sharif University of Technology)
Estimation Theory,
Digital Signal Processing II
Network Information Theory
Space Time Coding
Multiuser Detection
Wireless Communications
Audited (Sharif University of Technology)
Convex Optimization
Blind Source Separation
Data Compression
Adaptive Filtering
Network Information Theory

Taken (Tabriz University)
Information Theory
Advanced Communication
Digital Image Processing,
Coding Theory
Video Coding
Stochastic Processes
Digital Signal Processing
COMPUTING SKILLS

Proficient in MATLAB, C, C++, VHDL, and Python.

REFERENCES

- Farokh Marvasti

Sharif University of Technology, Tehran, Iran Email: fmarvasti@gmail.com

- Ali Aghagolzadeh
  Babol Noshirvani University of Technology, Babol, Iran.