***Research interests***

* Audio/speech signal processing
* Automatic speech recognition
* Robust speech recognition
* Speech enhancement
* Speaker adaptation in speech recognition
* Speaker/language recognition
* Audio/speech source localization/tracking/separation
* Audio and speech watermarking
* Image processing
* Digital and microprocessor-based systems

***Supervised Theses and Dissertations***

Ph.D.

* Speech recognition based on sparse representation and manifold learning – (Student: H. Ghaheri - Currently being undertaken).
* Speech noise reduction using sparse representation - (Student: S. Mavaddaty - Currently being undertaken).
* Use of missing data theorem for robust speech recognition with emphasis on classifier improvement (Student: K. Kafoori - Currently being undertaken).
* Use of compressive sampling methods for robust speech recognition (Student: S. Ahmadi – Currently being undertaken).
* Quality and intelligibility improvement of speech signal in non-stationary environments (Student: N. Faraji), Oct. 2013.
* Improvement of the underdetermined source separation methods for accurate sound source localization (Student: A. Pourmohammad), Jan. 2012.
* Robust speech recognition based on spectral compensation and feature normalization (Student: S. Seyedin), Oct. 2010.
* Improvement of hidden Markov model-based acoustic modeling (Student: J. Kabudian - consulting advisor), July 2010.
* Phonetic pronunciation variation modeling to generate a dynamic adaptive lexicon for CSR (Student: B. Vazirnezhad - consulting advisor), Sep. 2008.
* A Front-end for Improved Robustness in Automatic Speech Recognition (Student: G. Farahani), Dec. 2006.
* Prosody in Persian language and its use in speech recognition (Student: D. Gharavian), Nov. 2004.

M.Sc.

* Text-dependent voice conversion based on machine learning approaches (Nasiri), Feb. 2016.
* Segmentation and object recognition in color images degraded by noise (Rajabi), Jan. 2016.
* Design and Implementation of an Automatic classification system based on evolutionary approaches (Soltani), Aug. 2015.
* Identification of acoustic events in closed environments for monitoring applications (Alavinejad), Jun. 2015.
* Speech intelligibility improvement in noisy environments (Eideli), Feb. 2015.
* Steganography of data in speech signal (Salehifar - e-learning), Jan. 2015.
* Speech enhancement by means of speech dereverberation in reverberant enclosures (Maraghi), Oct. 2014.
* Signal Dereverberation using an iterative approach (Saleminejad - e-learning), Oct. 2014
* Joint DOA and TDOA Estimation for 3D Sound Source Localization of Reflective Surface (Mahmoodi), Dec. 2013.
* Blind source separation in determined and underdetermined scenarios in time-frequency domain by clustering observation vectors (Rafiee), Oct. 2013.
* Moving Object Tracking Using Camera Network (Motaman), July 2013.
* Improving the Efficiency of Automatic Spoken Language Identification Methods (Partovi), June 2013.
* Emotion Classification Based on Speech Features (Hosseini), Feb. 2013.
* Improving Robustness of Speech Recognition to Environmental Noises Using Spectral Processing (Amualyan), Feb. 2013.
* Combination of Multiple Spectral Statistical Features for Improved Voice Activity Detection under Noisy Environmental Conditions (Khaksar Haghani), Feb. 2012.
* Robust Speech Recognition based on Time-Frequency Approaches (Riazati), Jan. 2012.
* Blind Source Separation of Convolutive Mixtures for localization applications (Ghaffarzadegan), Jan. 2012.
* Digital audio watermarking robust to intentional and non-intentional attacks (Nariman-nejad), Feb. 2011.
* Speech Watermarking With Feature-Based Embedding (Zamanbin), June 2011.
* On the use of phase in robust speech recognition (Loveimi), 2010.
* Design and implementation of an automatic acoustic scene recognition system (Karbassi), 2010.
* Design, statistical evaluation and implementation of robust multimedia watermarking systems (Khademi), 2009.
* Spoken language identification using statistical methods (Ziaei), 2009.
* Robust speech recognition using sub-band processing (Yeganeh), 2009.
* Speech noise reduction using Singular Value Decomposition (Nazari), 2009.
* Voice source localization and separation (Maleki), 2009.
* Speaker adaptation via speaker clustering in speech recognition systems (Hazrati), 2008.
* Improvement in speech/music discrimination methods using LDA (Sajjadi), 2008.
* Voice activity detection in noisy environments using combination of multiple features (Soleimani), 2008.
* Who really speaks when? Speaker segmentation and identification in a multi-speaker environment using novel algorithms (MirRezaei), 2008.
* Independent component analysis and its use in improving Farsi speech recognition (Faraji), 2007.
* Feature-based noise-robust automatic speech recognition (Golshan), 2007.
* Design and simulation of a robust speech recognition system based on robust features, 2007 (Shariati, advisor).
* Distortion cancellation in speech signals (Shokri), 2006.
* Speaker clustering and segmentation in a multi-speaker environment (Ardakanian), 2006.
* Voice activity detection in noisy environments (Esmaeili - co-supervisor), 2006.
* Noise-robust front-end for speech recognition (Bassiri), 2005.
* Voice interface for the use of computer by the handicapped (Olya - co-supervisor), 2004.
* Persian text-independent speaker identification using Gaussian Mixture Models (Khayatzadeh), 2003.
* Robust continuous Persian speech recognition using model-based techniques (Bahrololum), 2003.
* Speaker Adaptation for continuous Persian speech recognition (Sharifian), 2003.
* Design and implementation of a robust speech recognizer in different environments, 2002 (Eshghi - advisor).
* Improved acoustic modeling in continuous Persian speech recognition (Shams), 2002.
* Statistical language modeling for continuous Persian speech recognition (Habibi), 2002.
* Improvements to isolated-word Persian speech recognizer (MirHosseini), 2001.
* PLC-based sequential control system design for Ray power plant; Turbine start section (Yaghubi - co-supervisor), 2001.
* PLC-based sequential control system design for Ray power plant; Synchronization and loading section (Shojaei - co-supervisor), 2001.
* Hybrid HMM/ANN Persian continuous speech recognition (Taheri), 2001.
* Continuous density HMM-based continuous Persian speech recognition (Parvizi), 2001.
* Farsi word segmentation using micro-prosodic features, 2001 (Dehghan - advisor).
* Alignment and labeling of continuous Persian speech using continuous density HMMs (Shirzad), 1999.
* Isolated speaker-independent Persian speech recognition based on continuous density HMMs, (Rostamzadeh), 1997.

***Patents***

* M. Karbasi, S.M. Ahadi and M. Bahmanian, “Automatic Recognition of Environmental Sounds using Dynamic Audio Features,” Iranian patent No. 73307, Jan. 7, 2012.
* S.M. Ahadi, G. Farahani and M.M. Homayounpour, "Noise Subtraction Algorithm in Autocorrelation Domain," Iranian patent No. 42009, Aug. 15, 2007.

***Publications***

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* + - *Pulse and Digital Circuits* (In Persian), Tehran: Amirkabir University Publications, 2015.
    - G. Farahani, S.M. Ahadi and M.M. Homayounpour, “*Autocorrelation-based Methods for Noise-Robust Speech Recognition,”* in Robust Speech Recognition and Understanding, M. Grimm and K. Kroschel, Eds., I-Tech Education and Publishing, Vienna, available at <http://www.books.i-techonline.com>
    - *Fundamentals of Microprocessors and Interfacing* (In Persian), 4th Edition, Tehran: Amirkabir University Publications, 2015.
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    - *Fundamentals of Microprocessors and Interfacing* (In Persian), Tehran: Amirkabir University Publications, 2002.

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### S. Mavaddaty, S.M. Ahadi and S. Seyedin, “A novel speech enhancement method by learnable sparse and low-rank decomposition and domain adaptation,” *Speech Communication*, 76 (2016), pp. 42-60.

### A. Soltani, S.M. Ahadi, N. Faraji, S. Sharifian, “Designing efficient discriminant functions for multi-category classification using evolutionary methods,” *Neurocomputing*, Vol. 173, Part 3, January 2016, pp. 1885-1897.

### K.E. Kafoori and S.M. Ahadi, “Bounded cepstral marginalization of missing data for robust speech recognition,” *Computer Speech and Language*, 36 (2016), pp. 1–23.

### H.R. Tohidypour and S.M. Ahadi, “New features for speech enhancement using bivariate shrinkage based on redundant wavelet filterbanks,” *Computer Speech and Language*, 35 (2016), pp. 93–115.

### S. Mavaddaty, S.M. Ahadi and S. Seyedin, “A Modified Coherence-based Dictionary Learning Method for Speech Enhancement,” *IET Signal Processing,* Vol. 9, No. 7, September 2015, pp. 537–545.

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### S. Seyedin, S.M. Ahadi and S. Gazor, “New Features Using Robust MVDR Spectrum of Filtered Autocorrelation Sequence for Robust Speech Recognition,” Hindawi, *The Scientific World Journal*, Volume 2013.

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### S.M. Ahadi, “On Prior Parameter Estimation for Bayesian Adaptation of Continuous Density Hidden Markov Models”, *Amirkabir Journal of Science and Technology*, Vol.10, No.39, Autumn/Winter 1998/99.

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### E. Rajaby, S.M. Ahadi and H. Aghaeinia, “Entropy-based Fuzzy C-means with Weighted Hue and Intensity for Color Image Segmentation,” in Proc. *International Conference on Signal Processing and Intelligent Systems* (*SPIS 2015*), December 2015, Tehran, Iran.

### E. Eideli, S.M. Ahadi and N. Faraji, “A Novel Speech Intelligibility Improvement Method Using Maximizing Mutual Information Measure,” in Proc. *10th European Congress and Exposition on Noise Control Engineering* (*EuroNoise 2015*), June 2015, Maastricht.

### Z. Hosseini and S.M. Ahadi, “A Front-End for Emotional Speech Classification based on New Sub-Band Filters,” in Proc. *23rd Iranian Conference on Electrical Engineering* (*ICEE* 2015), May 2015, Tehran, Iran.

### E. Partovi, S.M. Ahadi and N. Faraji, “Language Identification Based on Improved Training and Classification,” in Proc. *23rd Iranian Conference on Electrical Engineering* (*ICEE* 2015), May 2015, Tehran, Iran.

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### Z. Hojjati and S.M. Ahadi, “Design and Implementation of a Directional Loudspeaker using DSB Modulation,” in *Proc*. *International Conference on Acoustics and Vibration* (*ISAV* 2013), Tehran Dec. 2013.

### E. Loweimi, S.M. Ahadi, T. Drugman and S. Loveymi, “On the Importance of Pre-emphasis and Window Shape in Phase-Based Speech Recognition,” in *Proc. ISCA Workshop on Non-linear Speech Processing* (*NOLISP*), June 2013, Mons, Belgium.

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### M. Karbasi, S.M. Ahadi and M. Bahmanian, “Environmental Sound Classification using Spectral Dynamic Features,” in *Proc. 8th International Conference on Information, Communications and Signal Processing (ICICS)*, Dec. 2011, Singapore.

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### N. Faraji, S.M. Ahadi, H. Sheikhzadeh, and A. Moghaddamjoo, “A Novel Method for Data Segmentation to Covariance Stationary Regions,” in *Proc. 5th International Symposium on Telecommunications*, Dec. 2010, Tehran.

### N. Faraji, S.M. Ahadi, H. Sheikhzadeh, and A. Moghaddamjoo, “Speech segmentation using a hypothesis test based on Random Matrix Theory,” in *Proc. IEEE International Symposium on Signal Processing and Information Technology (ISSPIT)*, Dec. 2010, Luxor.

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