

Hossein Rabbani

Senior Member,
IEEE

Associate Professor
Department of Biomedical Engineering,
Isfahan University of Medical Sciences
&
Medical Image & Signal Processing
Research Centre



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Objective and Fields of Interest

Objective Research in multidimensional signal processing including biosignal analysis and modeling (especially medical image/volume), sparse transforms, noise reduction and estimation problem, image/video restoration, probability models of sparse domain's coefficients.

Fields of interest Biomedical signal analysis and processing including multidimensional data, time-frequency analysis tools including x-lets, denoising, statistical signal processing, applied mathematics (currently I am focusing on Statistical & Mathematical Modeling of Medical Signals and Systems).

Academic Qualifications

2013 –2014 Postdoctoral Research Fellow, Duke Eye Center, Durham, United States.

- Research topic: **“Automatic Analysis of Various Types of Leakages in Fluorescein Angiograms and Optical Coherence Tomography (OCT)”**
- Supervisor: Prof. Sina Farsiu

2011 Postdoctoral Research Scholar, The University of Iowa, Iowa, United States.

- Research topic: **“Optical Coherence Tomography (OCT) Image Analysis”**
- Supervisors: Prof. Milan Sonka & Prof. Michael Abramoff

2007 Visiting Research Scholar, Electrical & Computer Engineering Department, Queen’s University, Kingston, Ontario, Canada.

- Research topic: **“Statistical modeling of sparse domain’s coefficients and its application to medical image/volume denoising”**
- Supervisor: Prof. Saeed Gazor.

2002 – 2008

Doctoral Researches, Bioelectronics (1st rank in entrance exam)

Department of Biomedical Engineering (The Center of Excellence on Biomedical Engineering in Iran), **Amirkabir University of Technology** (Tehran Polytechnic), **Tehran, Iran.**

- Dissertation research topic: **“Medical Image/Volume Noise Reduction in Multidimensional Complex Wavelet Transform Domain Using Bivariate Mixture Models”**
- Supervisor: Prof. Mansur Vafadust
- Passed Ph.D. courses: advanced digital signal processing, biomedical signal processing, advanced biomedical signal processing, advanced digital image processing, advanced digital communication, spread spectrum, system identification, advanced neural network.
- Passed the qualifying examination in Sept. 2004.

2000 – 2002

Master of Science, Bioelectronics (3rd rank)

Department of Biomedical Engineering (The Center of Excellence on Biomedical Engineering in Iran), **Amirkabir University of Technology** (Tehran Polytechnic), **Tehran, Iran.**

- Dissertation research topic: **“Video Restoration based on Motion Estimation in Complex Wavelet Domain”**
- Supervisor: Prof. Mansur Vafadust
- Advisor: Prof. Shohreh Kasaei
- Passed M.Sc. courses: digital signal processing, biomedical signal processing, digital image processing, medical imaging systems, stochastic processes, statistical pattern recognition, digital control systems, bioinstrument, and neural network.

1997 – 2000

Bachelor of Science, Communication (1st rank)

Department of Electrical and Computer Engineering, Isfahan University of Technology, Isfahan, Iran.

- Dissertation research topic: **“Designing and Constructing of Laser Communication between Two Computers”**

Work Experience

2003-2016

Teaching

- **Undergraduate level courses**
(B.Sc. students, Amirkabir University of Technology):

- Statistics and probability
 - Analog and digital communication systems
- **Graduate level courses**
(M.Sc. & Ph.D. students, Isfahan University of Medical Sciences):
- Advanced Biomedical Signal Processing
 - Biological Signal & System Modeling
 - Biomedical Signal Processing
 - Digital Image Processing
 - Digital Signal Processing
 - Information Technology in Biomedicine
 - Medical Image Processing & Analysis
 - Neural Networks
 - Pattern Recognition
 - Stochastic Processes
 - Sparse Transforms and Their Applications in Signal Processing
 - System Identification
 - Advanced Biological Signal & System Modeling

Supervising and Advising

- **Supervisor:**

PhD dissertation researches entitled:

- Combination of graph based algorithms and time-frequency methods for processing of OCT's
- Seeking an appropriate feature extraction method for breast cancer recurrence prediction based on microarray gene expression data
- A new model based on multivariable Gaussianization of OCT data

PhD dissertation researches entitled (in progress):

- Automatic diagnosis of Mild Cognitive Impairment (MCI) by dictionary learning -based analysis of EEG signals
- Automatic detection of acute myeloid leukemia in microscopic images using dictionary learning
- Automatic analysis of features of AMD in OCT images using 3D curvelet transform

M.Sc. dissertation researches entitled:

- Image restoration using Gaussian mixture models with neighborhood nonlocal clustering
- Evaluation of the symmetricity of cup to disk ratio in left and right eyes of normal subjects
- Mosaicing macula OCT images and OCT optical disk

- Designing a dictionary for OCT images based on K-SVD algorithm using texture characteristics of retinal layers for image segmentation
- Automatic segmentation of corneal layer boundaries in OCT images and obtaining 3D maps of the entire thickness of cornea and inner layers
- Automatic detection of leishman bodies in bone marrow samples from patients with visceral leishmaniasis using level set method
- Evaluation of asymmetry of right and left eyes of normal subjects using extracted features from optical coherence tomography (OCT) and color fundus images
- Automatic diagnosis of malaria based on complete circle-ellipse fitting search algorithm
- Automatic segmentation and recognition of lung nodules in thoracic CT images using active contour modeling and convex hull
- Segmentation of enhanced depth imaging optical coherence tomography (EDI-OCT) images using graph cut algorithm based on Gaussian mixture model of wavelet features
- Forming projection images from retinal layers on the 3D optical coherence tomography (OCT) data and fusion of them using curvelet transform to form an optimal projection image
- Evaluation of image pre-compensation methods for enhancing visual efficiency in the presence of higher order ocular optical aberrations
- Extraction of 15-lead ECG signal from vectorcardiogram (VCG) signal using partial linear transformation for providing information from posterior side of the heart
- Detection of foveal avascular zone (FAZ) based on curvelet transform for grading of diabetic retinopathy
- Extraction of nucleolus candidate zone in white blood cells of peripheral blood smear images using curvelet transform
- A comparison between hp version of finite element method with EIDORS for electrical impedance tomography
- A comparison between ECG and VCG signals for detection of ischemia location
- Estimation of somatosensory evoked potentials with multi-adaptive filters
- A contourlet-based watermarking method for medical images
- Automatic detection of diabetic retinopathy by extraction of retinal image features in curvelet domain
- Estimating depth of anesthesia based on wavelet transform and neuro-fuzzy systems
- Microcalcification detection in mammographic images using fractal model in wavelet domain
- Persian script character recognition using PCA

- A comparison between ECG and VCG for detection of ischemia
- Automatic detection and recognition of lung nodule in CT image based on active contour
- Complexity analysis of EEG signals for Mild Cognitive Impairment (MCI) diagnosis (in progress)
- Automatic analysis of tracheal acoustic signals for apnea detection and introducing new clinical indices of depth of sedation (in progress)
- Statistical modeling of 3D OCT data by mixture model (in progress)
- 3D segmentation of proximal enamel lesions in micro-ct images (in progress)

B.Sc. dissertation research entitled:

- Angle detection for biomaterial based on image processing

- **Advisor:** M.Sc. dissertation researches entitled:

- Transform based ellipse detection in microscopic images using elliptical basis functions (in progress)
- Automatic extraction and recognition of myeloma cell in microscopic bone marrow aspiration images
- Extraction of candida fungus from pap smear images based on ridgelet transform for vulvovaginal candidiasis diagnosis
- Extraction of vessels, optic disc and fovea avascular zone from fundus fluorescein angiogram based on Hessian analysis of directional curvelet subbands
- Medical image compression with multi-wavelet
- A new adaptive technique for fast and accurate estimation of SSAEP

Honors

- I was really interested in studying mathematics before entering university and all of my grades in this field were excellent. I participated in the entrance exam of universities.
 - My grades in this exam were:
 - ✓ Mathematics: **98/100**
 - ✓ Physics: **86.7/100**
 - ✓ Chemistry: **91.2/100**
 - I had this opportunity to choose **all of the best universities** in Iran.
- B.Sc. Degree with the honor of the **1st rank** from Isfahan University of Technology.
- M.Sc. Degree with the honor of the **3rd rank** from Amirkabir University of Technology.
- **1st rank** in the Ph.D. entrance exam of Amirkabir University of Technology in bioelectrics.

- **1st rank** in the Ph.D. entrance exam of Isfahan University of Technology in communication engineering.
- **Outstanding selected Ph.D. thesis** by Iranian Society for Biomedical Engineering.
- **The winner of national prize of “Young Assistant Professors”.**
- **IEEE, Elected Senior Member, 2013**

Membership

- ✓ IEEE Senior Member
Signal Processing Society, Engineering in Medicine and Biology Society, Circuits and Systems Society, Computer Society
- ✓ SPIE member

Article Reviewer

- ✓ IEEE Transactions on Image Processing
- ✓ IEEE Transactions on Signal Processing
- ✓ IEEE Transactions on Medical Imaging
- ✓ IEEE Transactions on Biomedical Engineering
- ✓ IEEE Signal Processing Letters
- ✓ IEEE Transactions on Geoscience & Remote Sensing
- ✓ IEEE Transactions on Circuits & Systems for Video Technology
- ✓ IEEE Transactions on Multimedia
- ✓ IEEE Transactions on Systems, Man, and Cybernetics--Part B: Cybernetics
- ✓ IEEE Transactions on Biomedical Circuits and Systems
- ✓ IEEE Journal of Biomedical and Health Informatics
- ✓ IET Image Processing Journal
- ✓ IET Signal Processing Journal
- ✓ IET Computer Vision
- ✓ Pattern Recognition
- ✓ Signal Processing
- ✓ Computers in Biology & Medicine
- ✓ Digital Signal Processing
- ✓ Biomedical Signal Processing & Control
- ✓ Pattern Recognition Letters
- ✓ Ultrasonics
- ✓ Journal of Biophotonics

- ✓ Measurement
- ✓ Computer Methods and Programs in Biomedicine,
- ✓ Journal of Visual Image Communication & Representation
- ✓ Applied Optics
- ✓ Journal of the Optical Society of America A
- ✓ Biomedical Optics Express
- ✓ PLOS ONE
- ✓ The Computer Journal
- ✓ Medical & Biological Engineering & Computing
- ✓ Neural Computing & Applications
- ✓ Journal of Applied Mathematics
- ✓ EURASIP Journal on Image and Video Processing
- ✓ Signal, Image and Video Processing (Springer)
- ✓ Multidimensional Systems and Signal Processing (Springer)
- ✓ Circuits, Systems & Signal Processing (Springer)
- ✓ Current Medical Imaging Reviews
- ✓ International Journal of Pattern Recognition and Artificial Intelligence
- ✓ Journal of Innovative Optical Health Sciences
- ✓ Measurement Science Review
- ✓ Electronics Letters
- ✓ Journal of Electromagnetic Waves and Applications - Progress in Electromagnetic Research (PIER, PIER B,C,M, PIER Letters)
- ✓ Biomedical Engineering OnLine
- ✓ International Journal of Imaging Systems and Technology
- ✓ Journal of Research in Medical Sciences
- ✓ Iranian Journal of Biomedical Engineering
- ✓ Iranian Journal on Electrical & Computer Engineering
- ✓ Iranian Journal of Physics Research
- ✓ Several International IEEE Conferences and National Conferences

Editorial Board Member:

- ✓ Journal of Isfahan Medical School
- ✓ Journal of Medical Signals and Sensors (Editor-in-Chief)

Publications

International Journal Papers

- ✓ Z. Amini, H. Rabbani, "Statistical Modeling of Retinal Optical Coherence Tomography", **IEEE Transactions on Medical Imaging**, vol. 35, no. 6, pp. 1544-1554, 2016.
- ✓ O. Sarrafzadeh, H. Rabbani, A. Mehri Dehnavi, A. Talebi, "Analyzing features by SWLDA for the classification of HEP-2 cell images using GMM", **Pattern Recognition Letters**, vol. 82, part 1, pp. 44-85, Oct. 2016.
- ✓ Z. Amini, H. Rabbani, "Letter to the Editor: Correction to ‘The Normal-Laplace Distribution and its Relatives’", **Communications in Statistics - Theory and Methods**, vol. 46, no. 4, pp. 2076-2078, 2017.
- ✓ M. Esmaeili, A. Mehri-Dehnavi, and H. Rabbani, "3D Curvelet-Based Segmentation and Quantification of Drusen in Optical Coherence Tomography Images", **Journal of Electrical and Computer Engineering**, accepted, 2016.
- ✓ M. Shahmoradi, M. Lashgari, H. Rabbani, J. Qin, M. Swain, "A comparative study of new and current methods for dental micro-CT image denoising", **Dentomaxillofacial Radiology**, vol. 45, no. 3, 2016.
- ✓ Z. Amini, H. Rabbani, "Classification of Medical Image Modeling Methods: A Review", **Current Medical Imaging Reviews**, vol. 12, no. 2, pp. 130-148, 2016.
- ✓ H. Rabbani, R. Kafieh, M. Kazemian Jahromi, et al., "Obtaining Thickness Maps of Corneal Layers Using the Optimal Algorithm for Intracorneal Layer Segmentation," **International Journal of Biomedical Imaging**, vol. 2016, Article ID 1420230, 11 pages, 2016.
- ✓ M. Niknejad, H. Rabbani, M. Babaei-Zadeh, "Image Restoration Using Gaussian Mixture Models with Spatially Constrained Patch Clustering," **IEEE Transactions on Image Processing**, vol. 24, no. 11, pp. 3624-3636, Nov. 2015.
- ✓ R. Kafieh, H. Rabbani, I. Selesnick, "Three Dimensional Data-Driven Multi Scale Atomic Representation of Optical Coherence Tomography", **IEEE Transactions on Medical Imaging**, vol. 34, no. 5, pp. 1042-1062, 2015.
- ✓ H. Rabbani, M.J. Allingham, P.S. Mettu, S.W. Cousins, S. Farsiu, "Fully Automatic Segmentation of Fluorescein Leakage in Subjects with Diabetic Macular Edema", **Investigative Ophthalmology and Visual Science**, vol. 56, no. 3, pp. 1482-1492, 2015.
- ✓ MR. Sehhati, A. Mehri, H. Rabbani, M. Pourhossein, "Stable Gene Signature Selection for Prediction of Breast Cancer Recurrence Using Joint Mutual Information", **IEEE/ACM Transactions on Computational Biology and Bioinformatics**, vol. 12, no. 6, pp. 1440-1448, 2015.
- ✓ Z. Saeedizadeh, A. Mehri, A. Talebi, H. Rabbani, O. Sarrafzadeh, A. Vard, "Automatic Recognition of Myeloma Cells in Microscopic Images using Bottleneck algorithm, Modified Watershed and SVM Classifier", **Journal of Microscopy**, vol. 261, no. 1, pp. 46-56, 2015.
- ✓ R. Kafieh, H. Rabbani, F. Hajizadeh, M. D. Abramoff and M. Sonka, "Thickness Mapping of Eleven Retinal Layers in Normal Eyes Using Spectral Domain Optical Coherence Tomography", **Journal of Ophthalmology**, Article ID 259123, 14 pages, 2015.

- ✓ H. Rabbani and S. Gazor, "Local Probability Distribution of Natural Signals in Sparse Domains," **International Journal of Adaptive Control and Signal Processing**, vol. 28, no. 1, pp. 52-62, Jan. 2014.
- ✓ SH. Hajeb, H. Rabbani, MR. Akhlaghi, "A New Combined Method Based on Curvelet Transform and Morphological Operators for Automatic Detection of Foveal Avascular Zone", **Signal, Image & Video Processing**, vol. 8, no. 2, pp. 205-222, Feb. 2014.
- ✓ H. Danesh, R. Kafieh, H. Rabbani, F. Hajizadeh, "Segmentation of Choroidal Boundary in Enhanced Depth Imaging OCTs Using a Multiresolution Texture Based Modeling in Graph Cuts", **Computational and Mathematical Methods in Medicine**, vol. 2014, Article ID 479268, 9 pages.
- ✓ R. Kafieh, H. Rabbani, M. Sonka, M. D. Abramoff, "Intra-Retinal Layer Segmentation of 3D Optical Coherence Tomography Using Coarse Grained Diffusion Map", **Medical Image Analysis**, vol. 17, no. 8, pp. 907-928, Dec. 2013.
- ✓ R. Kafieh, H. Rabbani, S. Kermani, "A Review of Algorithms for Segmentation of Optical Coherence Tomography from Retina", **Journal of Medical Signals and Sensors**, vol. 3, no. 1, pp. 45-60, 2013.
- ✓ R. Kafieh, H. Rabbani, F. Hajizadeh, M. Ommani, S. Kermani, "An Accurate Multimodal 3D Vessel Segmentation Method Based on Brightness Variations on OCT Layers and Curvelet Domain Fundus Image Analysis", **IEEE Transactions on Biomedical Engineering**, vol. 60, no. 10, pp. 2815-2823, Oct. 2013.
- ✓ M. Sheikhhosseini, H. Rabbani, M. Zekri, A. Talebi, "Automatic Diagnosis of Malaria Based on Complete Circle-Ellipse Fitting Search Algorithm", **Journal of Microscopy**, vol. 252, no. 3, pp. 189-203, Dec. 2013.
- ✓ H. Rabbani, M. Sonka, M. D. Abramoff, "Optical Coherence Tomography Noise Reduction Using Anisotropic Local Bivariate Gaussian Mixture Prior in 3-D Complex Wavelet Domain", **International Journal of Biomedical Imaging**, vol. 2013, Article ID 417491, 23 pages.
- ✓ M. Golabakhsh, H. Rabbani, "Vessel Based Registration of Fundus and OCT Projection Images of Retina Using a Quadratic Registration Model", **IET Image Processing**, vol. 7, no. 8, pp. 768-776, Nov. 2013.
- ✓ M. Etehadtavakol, E.Y.K. Ng, V. Chandranc, H. Rabbani, "Separable and Non-separable Discrete Wavelet Transform based Texture Features and Image Classification of Breast Thermograms", **Infrared Physics & Technology**, vol. 61, pp. 274-286, Nov. 2013.
- ✓ R. Kafieh, H. Rabbani, M. Sonka, M. D. Abramoff, "Curvature Correction of Retinal OCTs Using Graph-Based Geometry Detection", **Physics in Medicine & Biology**, vol. 58, pp. 2925-2938, 2013.
- ✓ H. Rabbani, S. Gazor, "Video Denoising in 3-D Complex Wavelet Domain Using Local Bessel K-Form Prior", **IET Image Processing**, vol. 6, no. 9, pp. 1262-1274, Dec. 2012.
- ✓ M. Esmaeili, H. Rabbani, A. M. Dehnavi, A. Dehghani, "Automatic Detection of Exudates and Optic Disk in Retinal Images Using Curvelet Transform", **IET Image Processing**, vol. 6, no. 7, pp. 1005-1013, Oct. 2012.

- ✓ SH. Hajeb, H. Rabbani, MR. Akhlaghi “Diabetic Retinopathy Grading by Digital Curvelet Transform”, **Computational and Mathematical Methods in Medicine**, vol. 2012, Article ID 761901, 11 pages, 2012.
- ✓ SH. Hajeb, H. Rabbani, A. M. Dehnavi, MR. Akhlaghi, SH. H. Javanmard, “Analysis of Foveal Avascular Zone for Grading of Diabetic Retinopathy Severity Based on Curvelet Transform”, **Graefe's Archive for Clinical and Experimental Ophthalmology (Springer)**, vol. 250, no. 11, pp. 1607-1614, Nov. 2012.
- ✓ R. Soltanzadeh, H. Rabbani, A. Talebi, “Extraction of Nucleolus Candidate Zone in White Blood Cells of Peripheral Blood Smear Images Using Curvelet Transform”, **Computational and Mathematical Methods in Medicine**, vol. 2012, Article ID 574184, 12 pages, 2012.
- ✓ M. Esmaeili, H. Rabbani, A. Mehri, “Automatic Optic Disk Boundary Extraction by the Use of Curvelet Transform and Deformable Variational Level Set Model”, **Pattern Recognition**, vol. 47, no. 7, pp. 2832-2842, July 2012.
- ✓ H. Rabbani, M. P. Mahjub, E. Farahabadi, A. Farahabadi, A. Mehri, “An Entropy-Based Method for Ischemia Diagnosis Using ECG Signal in Wavelet Domain”, **Journal of Research in Medical Sciences**, vol. 16, no. 11, pp. 1473-1482, 2011.
- ✓ Hossein Rabbani, “Statistical modeling of low SNR magnetic resonance images in wavelet domain using Laplacian prior and two-sided Rayleigh noise for visual quality improvement”, **Measurement Science Review**, vol. 11, no. 4., pp. 125-130, 2011.
- ✓ Farhad Rahimi and Hossein Rabbani, “A dual adaptive watermarking scheme in contourlet domain for DICOM images”, **BioMedical Engineering OnLine**, 10:53, 2011.
- ✓ H. Rabbani H, M. P. Mahjub, E. Farahabadi, A. Farahabadi, "R Peak Detection in Electrocardiogram Signal Based on an Optimal Combination of Wavelet Transform, Hilbert Transform, and Adaptive Thresholding", **Journal of Medical Signals and Sensors**, vol. 1, no. 2, pp. 91-98, 2011.
- ✓ A. Mehri, E. Farahabadi, H. Rabbani, A. Farahabadi, M. P. Mahjub, N. Rajabi, “Detection and Classification of Cardiac Ischemia by Using Vectorcardiogram Signal via Neural Network”, **Journal of Research in Medical Sciences**, vol. 16, no. 2, pp. 136-142, 2011.
- ✓ H. Rabbani, S. Gazor, “Image Denoising Employing Local Mixture Models in Sparse Domains”, **IET Image Processing**, vol. 4, no. 5, pp. 413-428, Oct. 2010.
- ✓ H. Rabbani, M. Vafadoost, S. Gazor, R. Nezafat, “Wavelet-Based 3D Medical Image Denoising Using Bivariate Laplacian Mixture Model”, **IEEE Transactions on Biomedical Engineering**, vol. 56, no. 12, pp.2826-2837, Dec. 2009.
- ✓ H. Rabbani, “Image Denoising in Steerable Pyramid Domain Based on a Local Laplace Prior”, **Pattern Recognition**, vol. 42, pp. 2181-2193, Sept. 2009.
- ✓ H. Rabbani, M. Vafadoost, S. Gazor, P. Abolmaesumi, “Speckle Noise Reduction of Medical Ultrasound Images in Complex Wavelet Domain Using Mixture Priors”, **IEEE Transactions on Biomedical Engineering**, vol. 55, no.9, pp. 2152-2160, Sept. 2008.
- ✓ H. Rabbani, M. Vafadoost, “Image/Video Denoising Based on a Mixture of Laplace Distributions with Local Parameters in Multidimensional Complex Wavelet Domain”, **Signal Processing**, vol. 88, pp. 158-173, Jan. 2008.

- ✓ H. Rabbani, M. Vafadoost, "Wavelet Based Image Denoising Based on a Mixture of Laplace Distributions", **Iranian Journal of Science & Technology**, Transaction B., Engineering, vol. 30, no. B6., pp. 711-733, 2006.

Book Chapters

- ✓ H. Rabbani, R. Kafieh, Z. Amini, "Optical Coherence Tomography Image Analysis", **Wiley Encyclopedia of Electrical and Electronics Engineering**, ISBN 9780471346081, Publisher: John Wiley and Sons, pp. 1–16, 2016.
- ✓ V. Lakshminarayanan, D. Thapa, K. Raahemifar and H. Rabbani, "Compressive Sensing", **The Optics Encyclopedia**, ISBN 9783527600441, Publisher: John Wiley and Sons, pp. 1–26, 2015.
- ✓ Alireza Mehri Dehnavi, Nilufar Salehpour, Hossein Rabbani, Eiman Farahabadi, Amin Farahabadi, "Automatic Analysis of Vectorcardiogram Signal for Detection of Cardiovascular Diseases", **Cardiovascular Disease**, ISBN 978-1-922227-28-7, Publisher: iConcept Press, 2013.
- ✓ Hossein Rabbani, Alireza Mehri Dehnavi and Mehrab Ghanatbari, "Estimation the Depth of Anesthesia by the Use of Artificial Neural Network", **Artificial Neural Networks - Methodological Advances and Biomedical Applications**, ISBN 978-953-307-243-2, Edited by: Kenji Suzuki, Publisher: InTech, April 2011.

Selected International Conference Papers

- ✓ M. Mokhtari, H. Rabbani and A. Mehri-Dehnavi, "Alignment of optic nerve head optical coherence tomography B-scans in right and left eyes," accepted in 2016 IEEE International Conference on Image Processing (**ICIP**), Phoenix, AZ, USA, 2016, pp. 2355-2359.
- ✓ O. Sarrafzadeh , H. Rabbani , A. Mehri-Dehnavi, "Fast circlet based framework for optic disk detection", accepted in 2016 **IEEE** Workshop on Multimedia Signal Processing (**MMSP**), Montreal, Canada, Sept. 21-23, 2016.
- ✓ R. Rasti, H. Rabbani, A. Mehri, R. Kafieh, "Discrimination between diabetic macular edema and normal retinal OCT B-scan images based on convolutional neural networks", accepted in 2016 **IEEE** Workshop on Multimedia Signal Processing (**MMSP**), Montreal, Canada, Sept. 21-23, 2016.
- ✓ O. Sarrafzadeh, H. Rabbani, A. Mehri, A. Talebi, "Detecting different sub-types of acute myelogenous leukemia using dictionary learning and sparse representation", in Proc. IEEE International Conference on Image Processing (**ICIP**), Quebec City, Canada, Sept. 27-30, 2015, pp. 3339-3343.
- ✓ T. Mahmudi, R. Kafieh, H. Rabbani, A. Mehri, "Asymmetry evaluation of fundus images in right and left eyes using radon transform and fractal analysis", in Proc. IEEE International Conference on Image Processing (**ICIP**), Quebec City, Canada, Sept. 27-30, 2015, pp. 163-167.
- ✓ M. Niknejad, H. Rabbani, M. Babaie-Zadeh, Ch. Jutten, "Image interpolation using Gaussian mixture models with spatially constrained patch clustering", in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Brisbane, Australia, April 19-24, 2015, pp. 1613-1617.

- ✓ M. Niknejad, M. Sadeghi, M. Babaie-Zadeh, H. Rabbani, Ch. Jutten, "A Dictionary Learning Method for Sparse Representation Using a Homotopy Approach", *Latent Variable Analysis and Signal Separation*, vol. 9237 of the series *Lecture Notes in Computer Science (LVA/ICA)*, 2015, pp. 271-278.
- ✓ M. Lashgari, M. Shahmoradi, H. Rabbani, M. Swain, "A fast and accurate dental micro-CT image denoising based on total variation modeling", in Proc. **IEEE** Workshop on Signal Processing Systems, Hangzhou, China, Oct. 14-16, 2015.
- ✓ O. Sarrafzadeh, A. Mehri, H. Rabbani, N. Ghane, A. Talebi, "Circlet based framework for red blood cells segmentation and counting", in Proc. **IEEE** Workshop on Signal Processing Systems, Hangzhou, China, Oct. 14-16, 2015.
- ✓ O Sarrafzadeh, A. Mehr, H. Rabbani, A. Talebi, "A simple and accurate method for white blood cells segmentation using k-means algorithm", in Proc. **IEEE** Workshop on Signal Processing Systems, Hangzhou, China, Oct. 14-16, 2015.
- ✓ M Farahi, H Rabbani , A Talebi, O Sarrafzadeh, Sh Ensafi, "Automatic segmentation of Leishmania parasite in microscopic images using a modified CV level set method ", in Proc. **SPIE** 9817, Seventh International Conference on Graphic and Image Processing (ICGIP 2015), 98170K, Oct. 23-25, 2015.
- ✓ R. Shams, H. Rabbani, "A comparison between x-lets in denoising cDNA microarray images", in Proc. **IEEE** International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Florence, Italy, May 4-9, 2014, pp. 2483-2487.
- ✓ R. Kafieh, H. Rabbani, "Combination of graph theoretic grouping and time-frequency analysis for image segmentation with an example for EDI-OCT", in Proc. **IEEE** International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Florence, Italy, May 4-9, 2014, pp. 5115-5119.
- ✓ R. Kafieh, H. Rabbani, "Combination of graph theoretic grouping and time-frequency analysis for image segmentation with an example for EDI-OCT", in Proc. **IEEE** International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Florence, Italy, May 4-9, 2014, pp. 5115-5119.
- ✓ T. Mahmudi, R. Kafieh, H. Rabbani, "Comparison of macular OCTs in right and left eyes of normal people", in Proc. **SPIE** 9038, Medical Imaging 2014: Biomedical Applications in Molecular, Structural, and Functional Imaging, 90381K, San Diego, California, United States Feb. 15-20, 2014.
- ✓ O. Sarrafzadeh, H. Rabbani, A. Talebi, "The best features selection for Leukocytes classification in blood smear microscopic images", in Proc. **SPIE** 9041, Medical Imaging 2014: Digital Pathology, 90410P, San Diego, California, United States Feb. 15-20, 2014.
- ✓ F. Ghasemi, H. Rabbani, "A statistical model for 3D segmentation of retinal choroid in optical coherence tomography images", in Proc. **SPIE** 9038, Medical Imaging 2014: Biomedical Applications in Molecular, Structural, and Functional Imaging, 90381W, San Diego, California, United States Feb. 15-20, 2014.
- ✓ A. Soltani, S. Sadri, H. Rabbani, A. Doost-Hosseini, "Vessel Centerlines Extraction from Fundus Fluorescein Angiogram Based on Hessian Analysis of Directional Curvelet Subbands", in Proc. **IEEE** 2013 International Conference on Acoustics, Speech, and Signal

Processing (**ICASSP**), Vancouver, Canada, May 26-31, 2013, pp. 1070-1074.

- ✓ R. Kafieh, H. Danesh, H. Rabbani, M. Sonka, M. D. Abramoff, "Vessel Segmentation in Images of Optical Coherence Tomography Using Shadow Information and Thickening of Retinal Nerve Fiber Layer", in Proc. **IEEE** 2013 International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Vancouver, Canada, May 26-31, 2013, pp. 1075-1079.
- ✓ R. Kafieh, H. Rabbani, M. Sonka, M. D. Abramoff, "Intra-Retinal Layer Segmentation of Optical Coherence Tomography Using Diffusion Map", in Proc. **IEEE** 2013 International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Vancouver, Canada, May 26-31, 2013, pp. 1080-1084.
- ✓ R. Kafieh, H. Rabbani, M. D. Abramoff, M. Sonka, "OCT image alignment using diffusion maps", accepted in **IEEE** 2013 International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), Vancouver, Canada, May 26-31, 2013.
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- ✓ A. Farahabadi, E. Farahabadi, H. Rabbani, M. Rezvani, "An Automatic Method for Measuring The Angle of Lumbar Lordosis", **Journal of Isfahan Medical School**, vol. 30, no. 200, 2nd week, pp. 1145-1152.

Submitted Papers (Under Review)

- ✓ "Image Analysis in In-Vivo Stem Cell Tracking", **accepted**.
- ✓ "The hp-version of Finite Element Method for Electrical Impedance Tomography with EIDORS", **accepted**.
- ✓ "Interdisciplinary Researches in Iran", **accepted**.
- ✓ "Circular Symmetric Laplacian Mixture Model In Wavelet Diffusion for Dental Image Denoising", **accepted**.
- ✓ "Detection and Classification of Breast Cancer in Wavelet Sub-bands of Fractal Segmented Cancerous Zones", **accepted**.
- ✓ "Hybrid Method for Prediction of Metastasis in Breast Cancer Patients Using Gene Expression Signals", **accepted**.
- ✓ "Interdisciplinary Researches in Iran II", **accepted**.
- ✓ "Bio-Signal and System Modeling: From Image Processing to System Biology", **accepted**.
- ✓ "Using protein interaction database and support vector machine to improve gene signatures for prediction of breast cancer recurrence", **accepted**.
- ✓ "Designing and implementing bio-impedance spectroscopy device by measuring impedance in a mouse tissue", **accepted**.
- ✓ "Assessment of TGF- β 3 on production of aggrecan by human articular chondrocytes in pellet culture system", **accepted**.
- ✓ "An Automatic Algorithm for Segmentation of the Boundaries of Corneal Layers in Optical Coherence Tomography Images using Gaussian Mixture Model", **accepted**.
- ✓ "Interdisciplinary Researches in Iran III :(Multi-Dimensional) Medical Signal Analysis Softwares", **accepted**.

- ✓ "Analysis of Fundus Fluorescein Angiogram Based on the Hessian Matrix of Directional Curvelet Sub-bands and Distance Regularized Level Set Evolution ", **accepted.**

Under Preparation Papers

- ✓ "Statistical Modeling of Speckle in Optical Coherence Tomography Images"
- ✓ "Automatic Symptomatic Exudate-Associated Derangement (SEAD) Detection in Optical Coherence Tomography"
- ✓ "Image Modeling Using Spherically Invariance Random Processes"
- ✓ "Gauss-Taylor Expansion: A New Model for Statistical Modeling of Images in Sparse Domains"
- ✓ "On the Local EM Algorithm"
- ✓ "A New Speckle Noise Reduction Method in a Bayesian Framework"
- ✓ "A Two-Step Video Denoising Method Based on an Accurate Estimation of Local Variance in a Bayesian Framework "

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