

Hossein Rabbani

Senior Member,
IEEE

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



Tel: 98 (31) 3792-3862

E-mail: rabbani.h@ieee.org
h_rabbani@med.mui.ac.ir
rabbani.h@gmail.com

<http://hrabbani.site123.me>

<https://sites.google.com/site/hosseinrabbanikhorasgani>
<http://profiles.mui.ac.ir/hossein-rabbani>

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, Bioelectrics

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, Bioelectrics

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
 - Convex Optimization

Supervising and Advising

- **Supervisor:**

Postdoc projects:

- CS-based Hardware/Software development of OCT (A-scan, B-scan, C-scan)
- Automatic diagnosis of eye abnormalities by use of OCT and Fundus images
- Event detection from 24-hour multichannel intraluminal impedance pH monitoring by deep learning
- Designing a combinatory method (DL-based, Statistical-based, Sparse representation-based) for classification of DR
- Modeling of ocular images using optimum basis functions (DL & MCA)
- Intra-retinal layer and fluid segmentation of 3D OCT images by deep learning
- Quantitative analysis of hemorrhages in colour Fundus images
- Cyst detection in OCT images using mathematical models
- OCT modeling: statistical modeling vs. geometrical modeling vs. energy-based modeling
- Synchronized analysis of EEG, MRI images, and SPECT images of patients suffering from seizure

- **Supervisor/co-supervisor:**

PhD dissertation researches:

- Combination of graph-based algorithms and time-frequency methods for processing of OCTs
- Seeking an appropriate feature extraction method for breast cancer recurrence prediction based on microarray gene expression data
- A new model based on Gaussianization of OCT data
- Automatic analysis of features of AMD in OCT images using 3D curvelet transform
- Automatic detection of acute myeloid leukemia in microscopic images using dictionary learning
- Automatic diagnosis of Mild Cognitive Impairment (MCI) by dictionary learning -based analysis of EEG signals
- 3D OCT Classification by Deep Learning
- Fully automated segmentation of fluid/cyst regions in OCT images using neutrosophic sets and graph algorithms
- 3D Sparse Reconstruction of Cone-beam CT
- Multivariate Statistical Modeling of OCT Images
- Energy-based Modeling of OCT Images
- Introducing a Novel System for Persian Signature Recognition (Offline/Online) and Its Verification Based on x-let Transforms
- Study on the Application of the Markov Model for Breast Cancer Modeling Using Gene Expression Data
- Sparse Representation of PH Monitoring Signals
- Modeling of Retinal OCT Based on Mixture of Stochastic Differential Equations
- Cyst Segmentation in OCT Images Using Deep Learning in Sparse Domains
- Obtaining Optimum Basis Functions for Modeling of OCT Images in Sparse Domains to Classify Abnormal/Normal Samples
- Retinal Optical Coherence Tomography Image Analysis Based on Combination of Statistical and Geometrical Modeling
- Sparse Representation of OCT Images
- Evaluation of brain activity and changes in retinal layer thickness in optic neuritis patients using fMRI and OCT images
- Automatic classification of MS and NMO diseases versus normal in OCT images

PhD dissertation researches (in progress):

- Modeling of AS-OCT Images Using the Multifractal Method to Diagnose Angle-Closure Glaucoma
- OCT Image Analysis by Deep Learning Based on Multivariate BKF Modeling
- 3D OCT Reconstruction by Compressive Sensing
- Using stochastic differential equations and morphological component analysis in esophageal cancer classification in endoscopy video frames
- Investigating the relationship between the statistical and geometric features of brain lesions in magnetic resonance images and the classification of patients with multiple sclerosis
- Evaluation of volumetric changes of liver metastases using modified GAN based on modeling
- Modeling of Bone Marrow Aspiration Microscopic Images Using Sparse Representations of Suitable Bases to Segmentation of Effective Cells in Multiple Myeloma Cancer

M.Sc. dissertation researches:

- Detection of cystoid B-Scans in OCT Images using hidden Markov model and AlexNet
- 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
- Complexity analysis of EEG signals for Mild Cognitive Impairment diagnosis
- Evaluation of asymmetricity 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
- Comparison of Serpent, Twofish and Rijndael encryption methods for retinal images encryption
- 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
- 3D segmentation of proximal enamel lesions in micro-CT images
- Automatic analysis of tracheal acoustic signals for apnea detection and introducing new clinical indices of depth of sedation
- Statistical modeling of 3D OCT data by mixture model

B.Sc. dissertation research entitled:

- Angle detection for biomaterial based on image processing

- **Advisor:**

PhD dissertation researches:

- Retinal Image Registration of 3D OCT Volumes and Fluorescein Angiography Images
- Sparse Representation and Dictionary Learning for Super-resolution of OCT Images
- Clinical Analysis and validation of a semi-automatic software for segmentation of intra-retinal layers; intra- and sub-retinal cystoid regions in OCT image of diabetic patient in Isfahan in 2018-2019
- Grading of Supratentorial Astrocytic Brain Tumors Using Statistical Modeling of Magnetic Resonance Images based on Stochastic Differential Equations (in progress)
- Isolating common communication channels between cortical areas using their local field potential coherence through time-frequency analysis (in progress)
- Discriminative Diagnosis of Alzheimer's Disease Based on MRI-PET Fusion with Multitask Joint Dictionary Learning (in progress)

M.Sc. dissertation researches entitled:

- Evaluation of symmetry of left and right eyes in OCTA images of patients with carotid artery occlusion using image processing (in progress)
- Diagnosis and staging of diabetic retinopathy in OCTA images using texture based methods (in progress)
- Detecting the degree of carotid artery obstruction by applying deep learning algorithms on OCTA images (in progress)
- Detection of Parkinson's disease based on multivariate empirical mode decomposition (MEMD) of EEG signals and machine learning methods (in progress)
- Classification of patients with carotid artery occlusion using deep learning methods and OCT and OCTA images (in progress)
- Cyst detection in optical coherence tomography using Fuzzy models and Deep learning (in progress)
- Comparison of different functional connection methods and graph extraction from fMRI images for optimal parameter selection of distinguishing normal population and people with Alzheimer's disease
- A robust feature extraction and matching algorithm for monocular endoscopic videos data
- Investigation and simulation of optical systems for Fundus photography of human eye by Cell phone camera
- Optimization of visual stimulus sequence in a Brain-Computer Interface based on code modulated visual evoked potentials
- Automatic detection of microaneurysms in OCT images

- Polyp detection/segmentation in video colonoscopy by convolutional neural network
- Transform based ellipse detection in microscopic images using elliptical basis functions
- 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 (1996).
 - 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 (2000).
- M.Sc. Degree with the honor of the **3rd rank** from Amirkabir University of Technology (2002).
- **1st rank** in the Ph.D. entrance exam of Amirkabir University of Technology in bioelectrics & Isfahan Univ. of Tech. in communications (2002).
- **Outstanding selected Ph.D. thesis** by Iranian Society for Biomedical Engineering (2008).
- The winner of **national prize of “Young Assistant Professors”** (2009).
- **IEEE, Elected Senior Member** (2013)
- **The winner of Avicenna Research Award**, Isfahan Univ. of Med. Sciences (2019)
- The recipient of **Georg Forster research fellowship for experienced researchers**, Alexander von Humboldt Foundation (2019).
- **The winner of Seed Money Grant with Switzerland Leading House**

Membership

- ✓ IEEE Senior Member
Signal Processing Society, Engineering in Medicine & Biology Society
- ✓ Association for Computing Machinery (ACM)

Article Reviewer

- ✓ IEEE Trans. on PAMI
- ✓ IEEE Trans. on Image Processing
- ✓ IEEE Trans. on Signal Processing
- ✓ IEEE Trans. on Medical Imaging
- ✓ IEEE Trans. on Biomedical Engineering
- ✓ IEEE Signal Processing Letters
- ✓ IEEE Reviews in Biomedical Engineering
- ✓ Medical Image Analysis
- ✓ ACM Computing Surveys Review
- ✓ IEEE Trans. on Geoscience & Remote Sensing
- ✓ IEEE Trans. on Circuits & Systems for Video Technology
- ✓ IEEE Trans. on Multimedia
- ✓ IEEE Trans. on Systems, Man, and Cybernetics-Part B: Cybernetics
- ✓ IEEE Trans. on Biomedical Circuits and Systems
- ✓ IEEE Journal of Biomedical and Health Informatics
- ✓ IEEE Access
- ✓ IEEE Trans. on Instrumentation & Measurement
- ✓ 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
- ✓ Journal of Biomedical Optics
- ✓ Measurement
- ✓ Computer Methods and Programs in Biomedicine,
- ✓ Journal of Visual Image Communication & Representation
- ✓ Applied Optics
- ✓ Optics Letters
- ✓ Journal of Optical Society of America A
- ✓ Applied Soft Computing
- ✓ Biomedical Optics Express
- ✓ PLOS ONE
- ✓ Journal of Medical Systems
- ✓ 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
- ✓ Multidimensional Systems & Signal Processing
- ✓ Circuits, Systems & Signal Processing
- ✓ Current Medical Imaging Reviews
- ✓ International Journal of Pattern Recognition and Artificial Intelligence
- ✓ Journal of Innovative Optical Health Sciences
- ✓ Medical Principles & Practice
- ✓ Measurement Science Review
- ✓ Electronics Letters
- ✓ SPIE Journal of Medical Imaging

- ✓ Complexity
- ✓ Progress in Electromagnetic Research (PIER)
- ✓ BMC Open
- ✓ BMC Medical Imaging
- ✓ Biomedical Engineering OnLine
- ✓ International Journal of Imaging Systems and Technology
- ✓ Mathematical Problems in Engineering
- ✓ Cognitive Neurodynamics
- ✓ Journal on Modern Optics
- ✓ Optik
- ✓ Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization
- ✓ 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 Medical Signals and Sensors (Editor-in-Chief)

Publications

International Journal Papers

1. R. Arian, A. Vard, R. Kafieh, G. Plonka, **H. Rabbani***, "CircWaveDL: Modeling of optical coherence tomography images based on a new supervised tensor-based dictionary learning for classification of macular abnormalities", pp. 103060, 2025. doi: 10.1016/j.artmed.2024.103060
2. F. Shaker, Z. Baharlouei*, G. Plonka and **H. Rabbani**, "Application of Deep Dictionary Learning and Predefined Filters for Classification of Retinal Optical Coherence Tomography Images," IEEE Access, 2025. doi: 10.1109/ACCESS.2024.3522122.
3. R. Razavi, G. Plonka and **H. Rabbani**, "X-Let's Atom Combinations for Modeling and Denoising of OCT Images by Modified Morphological Component Analysis," IEEE Transactions on Medical Imaging, vol. 43, no. 2, pp. 760-770, 2024.
4. P. G. Daneshmand and **H. Rabbani***, "Tensor Ring Decomposition Guided Dictionary Learning for OCT Image Denoising," IEEE Transactions on Medical Imaging, vol. 43, no. 7, pp. 2547-2562, 2024.
5. M. Tajmirriahi, Z. Amini and **H. Rabbani**, "Local Self-Similar Solution of ADMM for Denoising of Retinal OCT Images," IEEE Transactions on Instrumentation and Measurement, vol. 73, pp. 1-8, Art no. 5006008, 2024.
6. M. Tajmirriahi, **H. Rabbani**, "Linear multifractional stable motion for modeling of fluid-filled regions in retinal optical coherence tomography images", Chaos, Solitons & Fractals, vol. 180, pp. 114486, 2024.
7. P.G. Daneshmand, **H. Rabbani***, "Total variation regularized tensor ring decomposition for OCT image denoising and super-resolution", Computers in Biology and Medicine, vol.

177, pp. 108591, 2024.

8. S. Jorjandi, Z. Amini, **H. Rabbani***, “Super-resolution of Retinal Optical Coherence Tomography Images Using Statistical Modeling”, *Journal of Medical Signals & Sensors*, vol. 14, no. 1, pp. 2, 2024.
9. Aghababaei, R. Arian, A. Soltanipour, F. Ashtari, **H. Rabbani**, R. Kafieh*, “Discrimination of Multiple Sclerosis using Scanning Laser Ophthalmoscopy Images with Autoencoder-Based Feature Extraction”, *Multiple Sclerosis and Related Disorders*, pp. 105743, 2024.
10. R. Arian, A. Aghababaei, A. Soltanipour, Z. Khodabandeh, S. Rakhshani, Sh. Iyer, F. Ashtari, **H. Rabbani**, R. Kafieh*, “SLO-Net: Enhancing Multiple Sclerosis Diagnosis Beyond Optical Coherence Tomography Using Infrared Reflectance Scanning Laser Ophthalmoscopy Images”, *Translational Vision Science & Technology*, vol. 13, no. 7, pp. 13, 2024.
11. M. Tajmirriahi, **H. Rabbani***, “A Review of EEG-based Localization of Epileptic Seizure Foci: Common Points with Multimodal Fusion of Brain Data”, *Journal of Medical Signals & Sensors*, vol. 14, no. 7, pp. 19, 2024.
12. M Monemian, **H Rabbani***, “A new method for the localization of hard exudates based on analyzing intensity incremental-decremental trends”, *IEEE Transactions on Instrumentation and Measurement*, vol. 73, pp. 1-8, Art no. 5029208, 2024.
13. M Monemian, P.G. Daneshmand, S. Rakhshani, **H Rabbani***, “A new texture-based labeling framework for hyper-reflective foci identification in retinal optical coherence tomography images”, *Scientific Reports*, vol. 14, no. 1, pp. 22933, 2024.
14. Z. Khodabandeh, **H. Rabbani**, F. Ashtari, H. Zimmermann, S.A.H. Motamedi, A.U. Brandet, P. Friedemann, R. Kafieh*, “Discrimination of multiple sclerosis using OCT images from two different centers”, *Multiple Sclerosis and Related Disorders*, vol. 77, pp. 104846, 2023.
15. M Monemian, **H Rabbani***, “A review on texture-based methods for anomaly detection in retinal optical coherence tomography images”, *Optik*, vol. 288, Art no. 171165, 2023.
16. S. Parsarad, N. Saeeidzadeh, G. J. Soufi, S. Shafieyoon, F. Hekmatnia, A. P. Zarei, S. Soleimany, A. Yousefi, H. Nazari, P. Torabi, A. S. Milani, S. A. M. Tonekaboni, **H. Rabbani**, A. Hekmatnia, R. Kafieh, “Biased Deep Learning Methods in Detection of COVID-19 Using CT Images: A Challenge Mounted by Subject-Wise-Split ISFCT Dataset”, *Journal of Imaging*, vol. 9, no. 8, Article No. 159, 2023.
17. Z. Baharlouei, **H. Rabbani***, and G. Plonka, “Wavelet scattering transform application in classification of retinal abnormalities using OCT images”, *Scientific Reports*, vol. 13, no. 1, pp. 19013, 2023.
18. Rasouli, M. Soheilipour, M. Raisi, **H. Rabbani**, N. Eghbalifard, P. Adibi, Peyman, “Reflux definitions in esophageal multi-channel intraluminal impedance”, *Gastroenterology and Hepatology From Bed to Bench*, vol. 16, no. 4, pp. 408, 2023.
19. R. Arian, A. Vard, R. Kafieh, G. Plonka, H. Rabbani, “A new convolutional neural network based on combination of circlets and wavelets for macular OCT classification”, *Scientific Reports*, vol. 13, no. 1, pp. 22582, 2023.

20. M Monemian, **H Rabbani***, “Detecting red-lesions from retinal fundus images using unique morphological features”, *Scientific Reports*, vol. 13, no. 1, pp. 3487, 2023.
21. A Abbasi, A Monadjemi, L Fang, **H Rabbani**, BJ Antony, H Ishikawa, “Mixed multiscale BM4D for three-dimensional optical coherence tomography denoising”, *Computers in Biology and Medicine*, vol. 155, pp. 106658, 2023.
1. M Monemian, **H Rabbani***, “Exudate identification in retinal fundus images using precise textural verifications”, *Scientific Reports*, vol. 13, no. 1, pp. 2824, 2023.
2. P Havaei, M Zekri, E Mahmoudzadeh, **H Rabbani**, “An efficient deep learning framework for P300 evoked related potential detection in EEG signal,” *Computer Methods and Programs in Biomedicine*, vol. 229, pp. 107324, 2023.
3. N Mousavi, M Monemian, P Ghaderi Daneshmand, M. Mirmohammadsadeghi, M. Zekri, **H. Rabbani***, “Cyst identification in retinal optical coherence tomography images using hidden Markov model”, *Scientific Reports*, vol. 13, no. 1, pp. 12, 2023.
4. R Darooei, M Nazari, R Kafieh, **H Rabbani***, “Dual-Tree Complex Wavelet Input Transform for Cyst Segmentation in OCT Images Based on a Deep Learning Framework”, *Photonics*, vol. 10, no. 1, pp. 11, 2023.
5. M Monemian, **H Rabbani***, “A Computationally Efficient Red-Lesion Extraction Method for Retinal Fundus Images”, *IEEE Transactions on Instrumentation and Measurement*, vol. 72, pp. 1-13, 2022.
6. M Tajmirriahi, Z Amini, **H Rabbani**, “Logarithmic Moments for Mixture of Symmetric Alpha Stable Modelling”, *IEEE Signal Processing Letters*, vol. 29, pp. 2527-2531, 2022.
7. M Aghanouri, N Dadashi Serej, **H Rabbani**, P Adibi, “Automatic esophagus Z - line delineation in endoscopic images using a new boundary linking method”, *IET Image Processing*, vol. 16, no. 14, pp. 3842-3853, 2022.
8. M Ezhei, G Plonka, **H Rabbani***, “Retinal optical coherence tomography image analysis by a restricted Boltzmann machine”, *Biomedical Optics Express*, vol. 13, no. 9, pp. 4539-4558, 2022.
9. R Almasi, A Vafaei, E Kazeminasab, **H Rabbani***, “Automatic detection of microaneurysms in optical coherence tomography images of retina using convolutional neural networks and transfer learning”, *Scientific Reports*, vol. 12, no. 1, pp. 1-11, 2022.
10. M Lashgari, **H Rabbani***, G Plonka, I Selesnick, “Reconstruction of Connected Digital Lines Based on Constrained Regularization”, *IEEE Transactions on Image Processing*, vol. 31, pp. 5613-5628, 2022.
11. ES Kazeminasab, R Almasi, B Shoushtarian, E Golkar, **H Rabbani***, “Automatic detection of microaneurysms in OCT images using bag of features”, *Computational and Mathematical Methods in Medicine*, pp. 1-10, 2022.
12. N Saeedizadeh, M Tajmirriahi, AR Haghani, Z Amini, E Khalili Pour, H Riazi-Esfahani, K Fadakar, R Kafieh, **H Rabbani**, “A Device-independent, Shape Preserving Retinal Optical Coherence Tomography Image Alignment Method Applying TV-Unet for RPE Layer Detection”, *IEEE Transactions on Instrumentation & Measurement*, vol. 71, pp. 1-8, 2022.

13. M Mirzapour, **H Rabbani**, "Investigation on accelerated ordered subsets image reconstruction techniques with superiorization methodology", *The European Physical Journal Plus*, vol. 137, no. 7, pp. 791, 2022.
14. M Tajmirriahi, Z Amini, R Kafieh, Hossein Rabbani, A. Mirzazadeh, SH Javanmard, "Statistical inference of COVID-19 outbreak: Delay distribution effect in EQIR modeling of epidemic", vol. 12, no. 2, pp. 95, 2022.
15. M Monemian, **H Rabbani***, "Directional analysis of intensity changes for determining the existence of cyst in optical coherence tomography images", *Scientific Reports*, vol. 12, no. 1, pp. 2105, 2022.
16. M Tajmirriahi, Z Amini, **H Rabbani**, R Kafieh, "An Interpretable Convolutional Neural Network for P300 Detection: Analysis of Time Frequency Features for Limited Data", *IEEE Sensors Journal*, vol. 22, no. 9, pp. 8685-8692, 2022.
17. AH Riazi, **H Rabbani**, R Kafieh, "Dynamic Brain Connectivity in Resting-State FMRI Using Spectral ICA and Graph Approach: Application to Healthy Controls and Multiple Sclerosis", *Diagnostics*, vol. 12, no. 9, pp. 2263, 2022.
18. N Teyfour, **H Rabbani***, I Jabbari, "Low-dose cone-beam computed tomography reconstruction through a fast three-dimensional compressed sensing method based on the three-dimensional pseudo-polar Fourier transform", *Journal of Medical Signals and Sensors*, vol. 12, no. 1, pp. 8, 2022.
19. M Monemian, **H Rabbani***, "Red-lesion extraction in retinal fundus images by directional intensity changes' analysis", *Scientific Reports*, vol. 11, no. 1, pp. 18223, 2021.
20. S Jorjandi, Z Amini, G Plonka, **H Rabbani***, "Statistical modeling of retinal optical coherence tomography using the Weibull mixture model", *Biomedical Optics Express*, vol. 12, no. 9, pp. 5470-5488, 2021.
21. M. Montazerin, Z. Sajjadifar, E. Khalili Pour, H. Riazi-Esfahani, T. Mahmoudi, **H. Rabbani**, H. Movahedian, AR Dehghani, MR Akhlaghi, R. Kafieh, "Livelayer: A semi-automatic software program for segmentation of layers and diabetic macular edema in optical coherence tomography images", *Scientific Reports*, vol. 11, no. 1, p. 13794, 2021.
22. R. Sharbati, H. R. Ramazi, F. Khoshnoudian, H. R. Amindavar & **H. Rabbani**, "Stochastic Model for Simulation of Ground-Motion Sequences Using Kernel-Based Smoothed Wavelet Transform and Gaussian Mixture Distribution", *Journal of Earthquake Engineering*, vol. 25, no. 12, pp. 2147-2177, 2021.
23. A. Rasouli, **H. Rabbani***, S. Kermani, M. Raisi, M. Soheilipour and P. Adibi, "A Multichannel Intraluminal Impedance Gastroesophageal Reflux Characterization Algorithm Based on Sparse Representation," *IEEE Journal of Biomedical and Health Informatics*. Vol. 25, no. 9, pp. 3576-3586, 2021.
24. M. Tajmirriahi, Z. Amini*, A. Hamidi, A. Zam and **H. Rabbani**, "Modeling of Retinal Optical Coherence Tomography Based on Stochastic Differential Equations: Application to Denoising," vol. 40, no. 8, pp. 2129-2141, *IEEE Transactions on Medical Imaging*. 2021.
25. E. Golkar, **H. Rabbani***, and A. Dehghani, "Hybrid registration of retinal fluorescein angiography and optical coherence tomography images of patients with diabetic retinopathy," *Biomed. Opt. Express*, vol. 12, pp. 1707-1724, 2021.

26. T Mahmudi, R Kafieh*, **H Rabbani**, AM Dehnavi, MR Akhlaghi, "Evaluation of asymmetry in right and left eyes of normal individuals using extracted features from optical coherence tomography and fundus images", *Journal of Medical Signals and Sensors*, vol. 11, no. 1, pp. 12-23, 2021.
27. M. Tajmirriahi, R. Kafieh*, Z. Amini and **H. Rabbani**, "A Lightweight Mimic Convolutional Auto-Encoder for Denoising Retinal Optical Coherence Tomography Images," *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-8, 2021, Art no. 4503908.
28. M. Samieinasab, Z. Amini and **H. Rabbani***, "Multivariate Statistical Modeling of Retinal Optical Coherence Tomography," *IEEE Transactions on Medical Imaging*, vol. 39, no. 11, pp. 3475-3487, Nov. 2020.
29. Z. Amini, **H. Rabbani*** and I. Selesnick, "Sparse Domain Gaussianization for Multi-Variate Statistical Modeling of Retinal OCT Images," *IEEE Transactions on Image Processing*, vol. 29, pp. 6873-6884, 2020.
30. N. Teyfour, **H. Rabbani***, R. Kafieh and I. Jabbari, "An Exact and Fast CBCT
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References

Prof. Mansur Vafadust

Tell: 98 (21) 6454-2362

Fax: 98 (21) 6646-8186

Email: vmansur@aut.ac.ir

Prof. Shohreh Kasaei

Tell: 98 (21) 6616-4631

Fax: 98 (21) 6607-2570

Email: skasaei@sharif.edu

<http://sharif.edu/~skasaei/>

Prof. Saeed Gazor

Tell: (613) 533-6591

Fax: (613) 533-6615
Email: saeed.gazor@ece.queensu.ca
<https://www.ece.queensu.ca/people/S-Gazor/index.html>

Prof. Ivan Selesnick

Tell: (718) 260-3416
Fax: (718) 260-3906
Email: selesi@poly.edu
<http://taco.poly.edu/selesi/>

Prof. Reza Nezafat

Tell: (617) 667-1747
Fax: (617) 975-5480
Email: rnezafat@bidmc.harvard.edu

Prof. Purang Abolmaesumi

Tell: (613) 533-2767
Fax: (613) 533-6513
Email: purang@cs.queensu.ca
<http://media.queensu.ca/purang/>

Prof. Michael D. Abramoff

Tell: (319) 384-5833
Fax: (319)-335-6028
Email: michael-abramoff@uiowa.edu
<http://webeye.ophth.uiowa.edu/dept/biograph/Abramoff.htm>

Prof. Milan Sonka

Tell: (319)-335-6052
Fax: (319)-335-6028
Email: milan-sonka@uiowa.edu
<http://www.engineering.uiowa.edu/~sonka/>

Prof. Sina Farsiu

Tell: (919)-684-6642
Fax: (919)-684-8983
Email: sina.farsiu@duke.edu
<http://people.duke.edu/~sf59/>