CURRICULUM VITALE

MOHAMMAD REZA AY

2012

Associate Professor, PhD
Department of Medical Physics and Biomedical Engineering
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Personal Information

Name: Mohammad Reza

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Date of Birth: 22/03/1972

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Academic Background

2003 to 2006 Faculty of Science

Geneva University, Geneva, Switzerland

Ph.D. Degree in Medical Physics

1999 to 2004 Faculty of Physics

Tehran Polytechnic University, Tehran, Iran

Ph.D. Degree in Medical Radiation

1996 to 1998 Faculty of Physics

Tehran Polytechnic University - Tehran - Iran

M.Sc. Degree in Medical Radiation

1990 to 1995 Faculty of Electrical Engineering

Shiraz University School Of Engineering – Shiraz - Iran

B.Sc. Degree in Electronic Engineering

Positions

- Deputy of Education, Department of Medical Physics and Biomedical Engineering, Tehran University of Medical Sciences, till 2012
- Head Medical Imaging Research Groups, Research Center for Science and Technology in Medicine, Tehran University of Medical Sciences
- Deputy of International Affairs, Research Center for Science and Technology in Medicine, Tehran University of Medical Sciences
- Physicist, PET/CT and Cyclotron Center, Research Institute for Nuclear Medicine, Shariati Hospital

Academic Honors

2008 Foundation of National Genius**, Iran**
The recipient of Research Grant for young Investigator

2008 International Union Against Cancer
The recipient of the ICRETT Transfer Technology Grant No. ICR/07/160 / 2007

2006 The recipient of a 2006 IEEE MIC Trainee Award
IEEE Nuclear Science Symposium and Medical Imaging Conference, San Diego, California, October 29 –November 4, 2006

2006 The recipient of a 2006 Young Investigator Award
12th Razi International Festival in Medical Sciences
Tehran, December 12, 2006

2003 Geneva University, Switzerland
Achieving the Swiss National Science Foundation grant SNSF 3152A0-102143 for PhD program in Geneva University

1998 Tehran Polytechnic University, Iran
Achieving first position in admission exam entering PhD program in Polytechnic University

1997 Tehran Polytechnic University, Iran
Named as Top student among Nuclear Engineering M.S. students.

1996 Achieving second position in admission exam entering M.S. degree program in IRAN i.e. 2st among 7500 participants.

Journal Editorial

- Member of the Editorial Board, The Open Journal of Medical Imaging
- Member of the Editorial Board, Iranian Journal of Nuclear Medicine

International Patent

- US Patent 2012/0027274 A1, "Non Linear Recursive Filter for Medical Image Processing"

Publications

Peer-reviewed Journal Publications:

1- **M. R. Ay**, A. Mehranian, A. Maleki, H. Ghadiri,P. Ghafarian and H. Zaidi "Experimental assessment of the influence of beam hardening filters on image quality and patient dose in volumetric 64-slice x-ray CT scanners" 2012, *Phys Med* ,Vol. 28, *in press*

2- N. Ghazanfari, S. Sarkar, G. Loudos, **M.R. Ay** " Quantitative assessment of the influence of crystal material and size on the performance of rotating dual head small animal PET scanners: Monte Carlo modeling" *Hellenic Journal of Nuclear Medicine*, 2012, Vol. 15, No. 1, pp. 33-39.

3- B. Teimourian , **M. R. Ay**, M. Shamsaei-Zafarghandi, P. Ghafarian, H. Ghadiri and H. Zaidi "A novel energy mapping approach for CT-based attenuation correction in PET" *Med Phys* 2012, Vol. 39, No. 4, pp 2078-2089.

4- F. Kalantari, H. Rajabi, **M. R. Ay,** A. Fard Esfahani, M. Eftekhari, B. Fallahi, A. Emami Ardekani" The in.uence of resolution recovery by using collimator detector response during 3D OSEM image reconstruction on 99mTc-ECD brain SPET images " *Hellenic Journal of Nuclear Medicine*, 2012, Vol. 15, No. 2, pp. 91-96.

5- N. Zeraatkar, **M. R. Ay**, P. Ghafarian, S. Sarkar, P. Geramifar, and A. Rahmim "Monte Carlo-based evaluation of inter-crystal scatter and penetration in the PET subsystem of three GE Discovery PET/CT scanners" *Nuclear. Instrumentation Methods in Physics Research A*, 2011, Vol. 659, pp. 508-514.

6- M.A. Habibzadeh, **M.R. Ay**, A.R. Kamali Asl, H. Ghadiri and H. Zaidi H "Impact of miscentering on patient dose and image noise in x-ray CT imaging: Phantom and clinical studies" *Phys Med* Vol. 28, 2012, pp. 191-199.

7- E. Saeedzadeh, S. Sarkar, A. Abbaspour Tehrani-Fard, **M.R. Ay**, H.R. Khosravi, G. Loudos "3D Calculation of Absorbed Dose for 131I Targeted Radiotherapy: A Monte Carlo Study" *Radiation Protection Dosimetry,* 2011 *in press*

8- F. Vedaei, A. Kamali asl, F. Kalantari, M. Ansari, **M.R. Ay** " Assessment of the impact of applying attenuation correction on the accuracy of activity recovery in Tc99m-ECD brain SPECT of healthy subject using Statistical Parametric Mapping (SPM) " *Iranian Journal of Nuclear Medicine,* 2011, **19,** pp. 52-59.

9- **M.R. Ay**, A. Mehranian, M. Abdoli, P. Ghafarian and H. Zaidi "Qualitative and quantitative assessment of metal artefacts arising from implantable cardiac pacing devices in oncological PET/CT studies: A phantom study" *Molecular Imaging & Biology*, 2011, Vol. 13, pp. 1077-1088.

10- P. Geramifar, **M.R. Ay**, M. Shamsaie Zafarghandi, S. Sarkar, G. Loudos, A. Rahmim, "Investigation of Time-of-Flight Benefits on the LYSO-Based PET/CT Scanner: A Monte Carlo Study Using GATE " *Nuclear. Instrumentation Methods in Physics Research A* , 2011 Vol. 641, pp. 121-127

11- **M. R. Ay**, M. Shirmohammad, S. Sarkar, A. Rahmim, H. Zaidi, "Comparative assessment of energy-mapping approaches in CT-based attenuation correction for PET" *Molecular Imaging & Biology,* 2011, Vol. 13, pp. 187-198.

12- H. Arabi, A Kamaliasl, **M.R. Ay** and H. Zaidi, " Novel detector design for reducing inter-cell x-ray cross-talk in the variable resolution x-ray CT scanner: A Monte Carlo study " *Medical Physics,* 2011, Vol. 30 pp. 1389-1396

13- N. Zaratkar, **M.R. Ay**, A Kamaliasl and H. Zaidi, " Accurate Monte Carlo modeling and performance assessment of the X-PET™ subsystem of the FLEX Triumph™ preclinical PET/CT scanner" *Medical Physics,* 2011, *Vol. 38, No 3, pp 1217-1225*

14- M. Abdoli, **M.R. Ay**, A. Ahmadian, A. J. O. Dierckx and H. Zaidi "Reduction of dental filling metallic artefacts in CT-based attenuation correction of PET data using weighted virtual sinograms optimized by a genetic algorithm" *Medical Physics,* 2010, Vol. 37, No 12, pp 6166-6177.

15- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, A. Rahmim, T. Schindler, O. Ratib and H. Zaidi " Is Metal Artifact Reduction Mandatory in Cardiac PET/CT Imaging in the Presence of Pacemaker and Implantable Cardioverter Defibrillator leads? " *European Journal of Nuclear Medicine and Molecular Imaging,* 2011, Vol. 38, No. 2, pp 252-262.

16- R. Prasad, **M.R. Ay**, O. Ratib and H. Zaidi "CT-based attenuation correction on the FLEX Triumph™ preclinical PET/CT scanner" *IEEE Trans Nuclear Sciences*, 2011, Vol. 58 pp 66-75.

17- M. Allahverdi, M. Zabih Zadeh, **M.R. Ay**, S.R. Mahdavi, M. Shahriari , A. Mesbahi and H. Alijanzadeh, " Monte Carlo estimation of electron contamination in a 18MV clinical photon beam", *Iranian Journal of Radiation Research*, 2011, Vol. 9 pp 15-28.

18- M. Rasouli, A. Takavar, **M.R. Ay**, S. Saber, and G. Loudos, " Effects of Crystal Pixel Size and Collimator Geometry on the Performance of a Pixelated Crystal Gamma Camera Using Monte Carlo Simulation " *Journal of Nuclear Medicine Technology*, 2010, Vol. 38, No 4, pp 199-204.

19- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, B. Fallahi, A. Rahmim, T. Schindler, O. Ratib and H. Zaidi "Coronary calcium score scan-based attenuation correction in cardiovascular PET imaging" *Nuclear Medicine Communication*, 2010, Vol. 31, No 9, pp 780-787.

20- A. Akbarzadeh, **M. R. Ay**, H. Ghadiri, S. Sarkar and H. Zaidi, "Measurement of scattered radiation in a volumetric 64-slice CT scanner using three experimental techniques" *Physics Medicine and Biology*, 2010, **55**, 2269-2280.

21- A. Mehranian, **M.R. Ay**, N. Riahi and H. Zaidi, "Quantifying the effect of anode surface roughness on diagnostic x-ray spectra using Monte Carlo simulation" *Medical Physics,* 2010, **37,** 742-752.

22- B. Teymoorian, **M.R. Ay**, M. Shamsaei Zafarghandi and H. Ghadiri, " A Novel Dual Energy CT-Based Attenuation Correction Method in PET/CT Systems: A Phantom Study" *Iranian Journal of Nuclear Medicine,* 2009, **17,** 42-49.

23- P. Geramifar, **M.R. Ay**, M. Shamsaie Zafarghandi,G. Loudos, A. Rahmim, " Performance Comparison of Four Commercial GE Discovery PET/CT Scanners: A Monte Carlo Study Using GATE" *Iranian Journal of Nuclear Medicine,* 2009, **17,** 26-33.

24- M. Abdoli, **M.R. Ay**, A. Ahmadian and H. Zaidi, " A Virtual Sinogram Method to Reduce Dental Metallic Implant Artefacts in CT-based Attenuation Correction for PET" *Nuclear Medicine Communication,* 2010**, 31,** 22-31.

25- M. Zabih Zadeh, **M.R. Ay**, M. Allahverdi, A. Mesbahi, S.R. Mahdavi and M. Shahriari, "Monte Carlo Estimation of Photoneotrons Contamination from High Energy Medical Accelerator in Threatment Room and Maze: A Simplified Model", *Radiation Detection Dosimetry*, 2009, **135,** 21-32.

26- T. Allahverdi, M. Allahverdi, N. Riahi Alam, **M.R. Ay**, M. Zahmatkesh, " Differential Dose Volume Histograms of Gamma Knife in Presence of Inhomogeneities Using MRI- polymer Gel Dosimetry and MC Simulation", *Medical Physics*, 2009, **36**,3002-3012.

27- A. Akbarzadeh, **M.R.Ay** ,H. Ghadiri, S.Sarkar, "A new method for experimental characterization of scattered radiation in 64-slice CT scanner" *Biomedical Imaging and Intervention Journal*, 2010, **6**(1):e3.

28- T. Allahverdi, M. Allahverdi, N. Riahi Alam, **M.R. Ay**, M. Zahmatkesh, " Verifying the accuracy of dose distribution in Gamma Knife unit in presence of inhomogeneities using PAGAT polymer gel dosimeter and MC simulation ", *Iranian J. of Radiation Research*, 2009, **7**, 49-56.

29- A. Akbarzadeh, **M.R.Ay** ,H.Ghadiri, S.Sarkar, "Calculation Of Scattered Radiation Profile In 64 Slice CT Scanners Using Experimental Measurement", *Iran J. Medical Physics* , 2010, **6**, 1-10.

30- L. Karimi-Afshar, N. Riahi Alam, **M.R.Ay**, M. Allahverdi, T. Purfallah, H. Hashemi, A. Farahani, B. Efie, M. Bakhteiari, "Evaluation of MRI-based Polymer Gel Dosimetry for Measurement of CT Dose Index (CTDI) on 64 slices CT Scanners", *Iran J. Medical Physics* , 2010, **6**, 59-70.

31- T. Allahverdi, M. Allahverdi, N. Riahi Alam, **M.R. Ay**, M. Zahmatkesh, "Evaluation of Dose Delivery Accuracy of Gamma Knife Using MRI Polymer Gel Dosimeter in an Inhomogeneous Phantom", *Journal of Physics: Conference Series* **164**, 2009, doi:10.1088/1742-6596/164/1/012066.

32- M. Shirmohammad, **M.R. Ay**, S. Sarkar and A. Rahmim, " Comparing 511 keV attenuation maps obtained from different energy mapping methods for CT based attenuation correction of PET data", *Iran J. Medical Physics* , 2008,**5**, 23-34.

33- T. Allahverdi, M. Allahverdi, N. Riahi Alam, **M.R. Ay**, M. Zahmatkesh and J.S. Ibbott, "Performance evaluation of MRI-based PAGAT polymer gel dosimeter in an inhomogeneous phantom using EGSnrc code on a co-60 machine", *Applied Radiation and Isotopes*, 2009, **67**, 186-191.

34- S. Lashkari, S. Sarkar, **M.R. Ay**, R. Rahmim, " The Influence of Crystal Material on Intercrystal Scattering and the Parallax Effect in PET Block Detectors: A Monte Carlo Study", *Iran J. Medical Physics* , 2008, **21**, 67-76.

35- A. Rahmim, J. Tang, M. A. Lodge, S. Lashkari, **M.R. Ay**, R. Lautamaki, B. M. W. Tsui, and F. Bengel "Analytic System Matrix Resolution Modeling in PET: An Application to Rb-82 Myocardial Perfusion Imaging", *Physics in Medicine and Biology*, 2008, **53,** 5947-5965.

36- A. Ahmadian, **M.R. Ay**, J.H. Bidgoli, S. Sarkar and H. Zaidi "Correction of oral contrast artefacts in CT-based attenuation correction of PET images using an automated segmentation algorithm" *European Journal of Nuclear Medicine and Molecular Imaging*, 2008, **35**, 1812-1823.

37- **M.R. Ay** and S. Sarkar, "Computed Tomography Based Attenuation Correction in PET/CT: Principles, Instrumentation, Protocols, Artifacts and Future Trends", *Iranian J. Nucl. Med.*, 2007, **15**, 1-29.

38- H. Zaidi and **M.R. Ay,** "Current status and new horizons in Monte Carlo simulation of x-ray CT scanners" *Medical & Biological Engineering & Computing* , 2007**, 45**, 809-817.

39- **M.R. Ay** and H. Zaidi, "Impact of x-ray tube settings and metallic leads on neurological PET imaging when using CT-based attenuation correction", *Nuclear. Instrumentation Methods in Physics Research A* , 2007, **571***,* 411-417.

40- **M.R. Ay** and H. Zaidi, "Computed tomography-based attenuation correction in neurological positron emission tomography: evaluation of the effect of x-ray tube voltage on quantitative analysis". *Nuclear Medicine Communication,* 2006, **27***,* 339-346.

41- **M.R. Ay** and H. Zaidi, "Assessment of errors caused by x-ray scatter and use of contrast medium when using CT-based attenuation correction in PET". *European Journal of Nuclear Medicine and Molecular Imaging*, 2006, **33** (11), 1301-1313.

42- **M.R. Ay** and H. Zaidi, "Development and validation of MCNP4C-based Monte Carlo simulator for fan- and cone-beam x-ray CT". *Physics in Medicine and Biology*, 2005. **50**(20): pp. 4863-4885.

43- **M.R. Ay,** S. Sarkar, M. Shahriari, D. Sardari, and H. Zaidi, "Assessment of different computational models for generation of x-ray spectra in diagnostic radiology and mammography", *Medical Physics,* **32**(6), pp. 1660-1675, 2005.

44- **M.R. Ay**, M. Shahriari, S. Sarkar, , M. Adib and H. Zaidi, "Monte Carlo simulation of x-ray spectra in diagnostic radiology and mammography using MCNP4C", *Physics in Medicine and Biology,* **49**(19) pp. 4897-4917, 2004.

45- ***M.R. Ay,*** S. Sarkar, M. Shahriari and P. Ghafarian, "Measurement of Organ Dose in Abdomen-Pelvis CT Exam as a Function of mA, KVp and Scanner Type by Monte Carlo Method", *Iranian J. of Radiation Research,* **1**(4), 187-194, 2004.

Proceeding and Conference Records:

1- Mehranian A, H. Salighe Rad, **M.R. Ay** , Rahmim A, and Zaidi H " Smoothly Clipped Absolute Deviation (SCAD) Regularization for Compressed Sensing MRI Using an Augmented Lagrangian Scheme " *IEEE Nuclear Science Symposium & Medical Imaging Conference,* Anaheim, CA, USA, 2012, *in press*

2- Mehranian A, **M.R. Ay** , Rahmim A, and Zaidi H " An Ordered-Subsets Proximal Preconditioned Gradient Algorithm for Total Variation Regularized PET Image Reconstruction" *IEEE Nuclear Science Symposium & Medical Imaging Conference,* Anaheim, CA, USA, 2012, *in press*

3- Akbarzadeh A, **M.R. Ay**, Ahmadian A, Riahi Alam N and Zaidi H "Impact of tissue classification on the accuracy of MR-based attenuation correction in PET-MRI" *IEEE Nuclear Science Symposium & Medical Imaging Conference,* Valencia, Spain, 23-29 October 2011, p. 2524–2530.

4- Mehranian A, **M.R. Ay** , Rahmim A, and Zaidi H "Sparsity constrained sinogram inpainting for metal artifact reduction in x-ray computed tomography" *IEEE Nuclear Science Symposium & Medical Imaging Conference,* Valencia, Spain, 23-29 October 2011, p. 3694–3699.

5- Najafi Darmian A, **M.R. Ay**, Ghafarian P, Pouladian M, Shirazi A, Ghadiri H, Akbarzadeh A and Zaidi H "Characterization of scattered radiation profile in volumetric 64-slice x-ray CT scanner: A Monte Carlo study" *IEEE Nuclear Science Symposium & Medical Imaging Conference,* Valencia, Spain, 23-29 October 2011, p. 2692–2696.

6- Mehranian A, **M.R. Ay**, Rahmim A and Zaidi H "Metal artifact reduction in CT-based attenuation correction of PET using Sobolev sinogram restoration" *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Valencia, Spain, 23-29 October 2011, p. 2936-2942.

7- Ghadiri H, Shiran MB, **M.R. Ay**, Soltanian-Zadeh H and Zaidi H "A novel energy mapping approach in CT-based attenuation correction of PET data using multi-energy CT imaging" *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Valencia, Spain, 23-29 October 2011, p. 2510-2515.

8- A. Emami, H. Ghadiri, **M.R. Ay**, S. Akhlagpour, A. Eslami, P. Ghafarian and S. Taghizadeh "A Novel Phantom for Accurate Performance Assessment of Bone Mineral Measurement Techniques: DEXA and QCT ", *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Valencia, Spain, 23-29 October 2011, p. 3441-3445.

9- H. Mohy-ud-Din, N. Karakatsanis, C. Endres, **M. R. Ay**, D. F. Wong, and A. Rahmim " Generalized inter-frame and intra-frame motion correction in dynamic PET imaging", *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Valencia, Spain, 23-29 October 2011, p. 3858-3862.

10- Khodadad D, Ahmadian A, **M.R. Ay**, Esfahani AF, Banaem HY and Zaidi H "B-spline based free form deformation thoracic non-rigid registration of CT and PET images", *International Conference on Graphic and Image Processing (ICGIP 2011)*, 1-3 October 2011, Cairo, Egypt, Proc. SPIE, Vol. 8285, *pp* 82851K.

11- N. Ghazanfari, **M.R. Ay**, N. Zeraatkar, S. Sarkar and G. Loudos, " Quantitative Assessment of the influence of crystal material and size on the Inter Crystal Scattering and Penetration effect in pixilated dual head small animal PET scanner", *5th Kuala Lumpur International Conference on Biomedical Engineering*, 20-23 June 2011, Kuala Lumpur, Malaysia, IFMBE Proceedings 35, p. 712-715

12- F. Adibpour, **M.R. Ay**, S. Sarkar and G. Loudos, " Quantification of Inter-crystal Scattering and Parallax Effect in Pixelated High Resolution Small Animal Gamma Camera: A Monte Carlo Study ", *5th Kuala Lumpur International Conference on Biomedical Engineering*, 20-23 June 2011, Kuala Lumpur, Malaysia, IFMBE Proceedings 35, p. 708-711

13- A. Emami, H. Ghadiri, **M.R. Ay**, S. Akhlagpour, A. Eslami, P. Ghafarian and S. Taghizadeh "A Novel Phantom for Accurate Performance Assessment of Bone Mineral Measurement Techniques: DEXA and QCT ", *5th Kuala Lumpur International Conference on Biomedical Engineering*, 20-23 June 2011, Kuala Lumpur, Malaysia, IFMBE Proceedings 35, p. 47-50

14- N. Zeraatkar, **M.R. Ay**, S. Sarkar, P. Geramifar and A. Rahmim, "Quantification of Inter-Crystal Scatter and Penetration Events in GE Discovery RX PET/CT Scanner: a Monte Carlo Simulation ", IEEE Nuclear Science Symposium & Medical Imaging Conference, Knoxville, Tennessee, 2010, pp. 2403-2408

15- A. Rahmim, J. Tang, **M.R. Ay** and F. M. Bengel, " 4D Respiratory motion-corrected Rb-82 myocardial perfusion PET imaging ", IEEE Nuclear Science Symposium & Medical Imaging Conference, Knoxville, Tennessee, 2010, *pp.* 3312-3316

16- A. Najafi Darmian, **M.R. Ay**, M. Pouladian, A. Shirazi, H.Ghadiri and A. Akbarzadeh "Monte Carlo Characterization of Scattered radiation profile in Volumetric 64 slice CT using GATE", *5th Kuala Lumpur International Conference on Biomedical Engineering*, 20-23 June 2011, Kuala Lumpur, Malaysia, IFMBE Proceedings 35, p. 694-697

17- B. Teimourian, **M.R. Ay**, H. Ghadiri, M. Shamsaei Zafarghandi and H. Zaidi "A Novel Approach for Implementation of Dual Energy Mapping Technique in CT-Based Attenuation Correction Using Single kVP Imaging: A Feasibility Study" The 12th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2010), Chalkidiki, Greece, MEDICON 2010, IFMBE Proceedings 29, pp. 220–223, 2010.

18- S.M. Akbari, **M.R. Ay**, A. Kamali Asl, H. Ghadiri and H. Zaidi " Experimental Measurement of Modulation Transfer Function (MTF) in Five Commercial CT Scanners" The 12th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2010), Chalkidiki, Greece, MEDICON 2010, IFMBE Proceedings 29, pp. 351–354, 2010.

19- A. Mehranian, **M.R. Ay** and H. Zaidi " CT2MCNP: An Integrated Package for Constructing Patient-Specific Voxel-Based Phantoms Dedicated for MCNP(X) Monte Carlo Code" The 12th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2010), Chalkidiki, Greece, MEDICON 2010, IFMBE Proceedings 29, pp. 319–322, 2010.

20- M.A. Habibzadeh, **M.R. Ay**, A. Kamali Asl, H. Ghadiri and H. Zaidi" The Influence of Patient Miscentering on Patient Dose and Image Noise in Two Commercial CT Scanners" The 12th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2010), Chalkidiki, Greece, MEDICON 2010, IFMBE Proceedings 29, pp. 327–330, 2010.

21- N. Zeraatkar, **M.R. Ay**, A. Kamali-Asl and H. Zaidi" A Novel Model for Monte Carlo Simulation of Performance Parameters of the Rodent Research PET (RRPET) Camera Based on NEMA NU-4 Standards" The 12th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2010), Chalkidiki, Greece, MEDICON 2010, IFMBE Proceedings 29, pp. 311–314, 2010.

22- M. Abdoli , **M.R. Ay**, A. Ahmadian and H. Zaidi "Reduction of dental filling metallic artifacts in CT-based attenuation correction of PET data using weighted virtual sinograms" IEEE Nuclear Science Symposium & Medical Imaging Conference, Orlando (FL) USA, 25-31 October 2009, 2752-2755.

23- A. Mehranian , **M.R. Ay**, N. Riahi Alam and H. Zaidi "Quantitative assessment of the effect of anode surface roughness on diagnostic x-ray spectra using Monte Carlo simulation" IEEE Nuclear Science Symposium & Medical Imaging Conference, Orlando (FL) USA, 25-31 October 2009, 2902-2907.

24- R. Prasad, **M.R Ay** , O. Ratib and H. Zaidi "CT-based attenuation correction on the FLEX Triumph™ preclinical PET/CT scanner" IEEE Nuclear Science Symposium & Medical Imaging Conference, Orlando (FL) USA, 25-31 October 2009, 3357-3362.

25- **M.R. Ay**, A. Maleki, H. Ghadiri, P. Ghafarian, A. Ahmadian and H. Zaidi, " The Influence of X-ray Spectra Filtration on Image Quality and Patient Dose in the GE VCT 64-Slice Cardiac CT Scanner", The 3rd International Conference on Bioinformatics and Biomedical Engineering (IEEE iCBBE 2009), June 11th to 13th, 2009, 1-4, Beijing, China.

26- P. Ghafarian and S.M.R. Aghamiri, **M.R. Ay**, A. Rahmim and H. Zaidi, "Quantification of PET and CT Data Misalignment Errors in Cardiac PET/CT: Clinical and Phantom Studies", The 3rd International Conference on Bioinformatics and Biomedical Engineering (IEEE iCBBE 2009), June 11th to 13th, 2009, 1-4, Beijing, China.

27- M. Abdoli, **M.R. Ay**, A. Ahmadian and H. Zaidi, "Metal Artifact Reduction in CT-Based Attenuation Correction of PET Data Using the Virtual Sinogram Concept", The 3rd International Conference on Bioinformatics and Biomedical Engineering (IEEE iCBBE 2009), June 11th to 13th, 2009, 1-4, Beijing, China.

28- L. Karimiafshar, N. Riyahi Alam, **M.R. Ay**, M. Alahverdi, T. Alahvirdi Pourfallah , H. Hashemi, A. Farahani,B. Rafiei and M. Bakhtiar, " A Novel Application of MRI-Polymer Gel Dosimeter for Measurement of CTDI on X-Ray 64 Slices CT Scanner", *The World Congress on Medical Physics and Biomedical Engineering*, Germany, Munich, 7-12 September 2009, IFMBE Proceedings 25, pp. 541-544

29- P. Allahverdi, N. Riahi Alam, M. Allahverdi, **M.R. Ay**, M. Zahmatkesh M, " Evaluation of Dose Delivery Accuracy of Gamma Knife Using MRI Polymer Gel Dosimeter in an Inhomogeneous Phantom", 5th Congress on Radiotherpy Gel Dosimetry, 2008 , Greece, 399-403

30- P. Allahverdi, N. Riahi Alam, M. Allahverdi, **M.R. Ay**, M. Zahmatkesh M, " EGSnrc calculated and MRI-Polymer Gel Dosimeter Measured Dose Distribution of Gamma Knife in Presence of Inhomogeneities", International Congress of Medical physics, India, 2008.

31- P. Geramifar, **M.R. Ay**, M. Shamsai Zafarghandi, G. Loudos, A. Rahmim" Monte Carlo Based Performance Assessment of Four Commercial GE Discovery PET/CT Scanners Using GATE" *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Dresden, Germany, 19-25 October 2008, 3995-3999.

32- A. Rahmim, J. Tang, M. A. Lodge, S. Lashkari, **M.R. Ay**, R. Lautamaki, B. M. W. Tsui, and F. Bengel" Rb-82 Cardiac PET Imaging with Resolution Modeling" *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Dresden, Germany, 19-25 October 2008, 3643-3650.

33- A. Akbarzadeh, **M.R. Ay**, H. Ghadiri, S. Sarkar and H. Zaidi"A hybrid approach for accurate estimation of the scatter component in x-ray CT combining experimental measurements and Monte Carlo simulations" *IEEE Nuclear Science Symposium & Medical Imaging Conference*, Dresden, Germany, 19-25 October 2008, 3864-3867.

34- M. Rasouli, **M.R. Ay**, A. Takavar, S. Lashkari and G. Loudos " The Influence of InterCrystal Scattering on Detection Efficiency of Dedicated Breast Gamma Camera: A Monte Carlo Study" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp.* 2451–2454.

35- N. Dehestani, S. Sarkar, **M.R. Ay**, M. Sadeghi and M. Shafaei "Comparative Assessment of Rotating Slat and Parallel Hole Collimator Performance in GE DST-Xli Gamma Camera: A Monte Carlo Study" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp.* 1062–1065

36- **M.R. Ay**, J.H. Bidgoli, P. Ghafarian and H. Zaidi "Reduction of Intravenous Contrast Related Artifacts in CT-based Attenuation Corrected PET Images" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp*. 513–516

37- M. Shafaei, **M.R. Ay**, S. Sardari and H. Zaidi "Monte Carlo assessment of geometric, scatter and septal penetration components in high energy collimators" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp*. 2479–2482

38- M. Shirmohammad , **M.R. Ay** , A. Rahmim , S. Sarkar and H. Zaidi "Comparative assessment of different energy mapping approaches in CT based attenuation correction: a patient study" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp.* 496–499

39- M. Abdoli, **M.R Ay** , A. Ahmadian, N. Sahba and H. Zaidi "A novel approach for reducing dental filling artefacts in CT-based attenuation correction of head and neck oncologic PET/CT data" *4th European Congress of the International Federation of Medical and Biological Engineering*, Antwerp, Belgium, 23-27 November 2008 *ECIFMBE 2008, IFMBE Proceedings 22, pp.* 492–495

40- A. Akbarzadeh A, **M.R. Ay**, H. Ghadiri, S. Sarkar and H. Zaidi "A novel approach for experimental measurement of scatter profile and scatter to primary ratio in a 64-slice CT scanner", *4th Kuala Lumpur International Conference on Biomedical Engineering*, 25-28 June 2008, Kuala Lumpur, Malaysia, IFMBE Proceedings Series, Vol. 21, *pp* 473-477.

41- S. Lashkari, S. Sarkar, **M.R. Ay** and A. Rahmim, "The Influence of Crystal Material on Intercrystal Scattering and the Parallax Effect in PET Block Detectors: A Monte Carlo Study", *4th Kuala Lumpur International Conference on Biomedical Engineering*, 25-28 June 2008, Kuala Lumpur, Malaysia, IFMBE Proceedings Series, Vol. 21, *pp* 633-636.

42- M. Shirmohammad, **M.R. Ay**, H. Ghadiri, S. Sarkar and A. Rahmim, "Comparative Assessment of Different Energy Mapping Methods for Generation of 511- keV Attenuation Map from CT Images in PET/CT Systems: A Phantom Study", *5th IEEE International*

Symposium on Biomedical Imaging: From Nano to Macro, 14-17 May, Paris, France, 2008, 644-647.

43- P. Geramifar, **M.R. Ay**, M. Shamsayee, G. Lodous and A. Rahmim, "Monte Carlo Assessment of Time-of-Flight Benefits on The LYSO-Based Discovery RX PET/CT Scanner", *5th IEEE International Symposium on Biomedical Imaging: From Nano to Macro*, 14-17 May, Paris, France, 2008, 364-367.

44- A. Rahmim, M. Lodge, J. Tang, S. Lashkari and **M.R. Ay**, "Analytic System Matrix Resolution in PET: An Application to RB-82 Cardiac Imaging", *5th IEEE International Symposium on Biomedical Imaging: From Nano to Macro*, 14-17 May, Paris, France, 2008, 1307-1310.

45- **M.R. Ay**, H. Ghadiri, P. Ghafarian**,** S**.** Sarkar and H. Zaidi "Influence of energy indexing algorithm and electron substeps on MCNP4C electron transport: Application to simulation of x-ray spectra in diagnostic radiology and mammography" *Proceedings of IEEE Nuclear Science Symposium & Medical Imaging Conference*, Honolulu, Hawaii, 28 October – 3 November 2007, Vol. 5, *pp* 4006-4011.

46- J.H. Bidgoli, **M.R. Ay**, S. Sarkar, A. Ahmadian and H. Zaidi "Correction of correction of PET images using an automated segmentation algorithm" *Proceedings of IEEE Nuclear Science Symposium & Medical Imaging Conference*, Honolulu, Hawaii, 28 October – 3 November 2007, Vol. 5, *pp* 3542-3547.

47- P. Ghafarian, **M.R. Ay**, H. Ghadiri, S. Sarkar and H. Zaidi "Impact of x-ray tube voltage, field size and phantom thickness on scattered radiation in diagnostic radiology: A Monte Carlo investigation" *Proceedings of IEEE Nuclear Science Symposium & Medical Imaging Conference*, Honolulu, Hawaii, 28 October – 3 November 2007, Vol. 5, *pp* 3830-3834.

48- **M.R. Ay**, P. Ghafarian and H. Zaidi "A hybrid approach for fast simulation of x-ray computed tomography" *Proceedings of IEEE Nuclear Science Symposium & Medical*

Imaging Conference, Honolulu, Hawaii, 28 October – 3 November 2007, Vol. 4, *pp* 3155-3160.

49- **M.R. Ay** and H. Zaidi. "Simulation-based assessment of the impact of contrast medium on CT-based attenuation correction in PET", *Proceedings of IEEE Nuclear Science Symposium & Medical Imaging Conference*. San Diego, USA, 29 October - 4 November 2006, Vol. 5; *pp.* 2731-2735.
Recipient of 2006 IEEE Medical Imaging Conference Award

50- H. Zaidi and **M.R. Ay** "Impact of x-ray scatter when using CT-based attenuation correction in PET: A Monte Carlo investigation" Proceedings *of IEEE Nuclear Science Symposium & Medical Imaging Conferenc*e, San Diego, USA, 29 October - 4 November 2006, Vol. 4; *pp.* 2161-2165.

51- H. Ghadiri and **M.R. Ay**. "A Novel Hybrid Approach for Measurement of Bone Mineral Density and Content with High Signal to Noise Ratio", Proceedings of *World Congress on Medical physics and Biomedical Engineerin,* Seoul, Korea, August 27 – September 1, 2006, *pp.* 1324-1327.

52- **M.R. Ay,** S. Sarkar, M. Shahriari, D. Sardari, and H. Zaidi. "MCNP4C-based Monte Carlo simulator for fan- and cone-beam x-ray CT: development and experimental validation". Proceedings *of 14th International Conference of Medical Physics. Biomedizinische Technik.* 2005. Nuremberg, Germany, Sept. 14-17, 2005. **50 Suppl Part 1**: *pp.* 360-361.

53- **M.R. Ay,** S. Sarkar, M. Shahriari, D. Sardari, and H. Zaidi."Comparative assessment of different computational models for generation of x-ray spectra in diagnostic radiology and mammography". Proceedings of *IEEE Nuclear Science Symposium & Medical Imaging Conference.* 2004. Oct. 19-22, Rome, Italy. **4**: *pp.* 4190-4194.

Published Abstract:

1- **M. R. Ay** , H. Arabi, M. H. Farahani, N. Zeraatkar, S. Sarkar, S. Sajed, N. Naderi and P. Ghafaian**,** " SURGEOSIGHTTM: An Intraoprative Hand Held Gamma Camera for Precise Localization of Sentine Lymph Nodes" *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

2- **M. R. Ay** , H. Arabi, M. H. Farahani, N. Zeraatkar, S. Sarkar, S. Sajed, N. Naderi and P. Ghafaian**,** " Design and Development of a High Resolution Small Animal Imaging System for Mice and Rat " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

3- P. Geramifar, M. Shamsaie Zafarghandi, **M.R. Ay,** " Standardized Uptake Value-Based Evaluations of Respiratory-Induced Errors in CTAC PET Images: A Simulation Study Using 4D XCAT Phantom " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

4- N. Zeraatkar, M. H. Farahani, H. Arabi, S. Sarkar, S. Sajedi, N. Naderi, P. Ghafarian, A. Rahmim and **M.R. Ay,** "An Innovative Rotation-Based Iterative Resolution Recovery for HiReSPECT™: a Dedicated Small Animal SPECT System" *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

5- P. Khareti, H. Salighe Rad, and **M.R. Ay** " Determination of Attenuation Map at 511 keV Employing 3D Short Echo-Time MR Imaging in the Head Area: Application in MR-Based AC of PET data " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

6- L. Saleki, A. Bitarafan-Rajabi, N. Yaghobi, B. Falahi, and **M.R. Ay** " Quantification of the influence of misregistration between CT and SPECT images on the accuracy of CT-based attenuation correction of cardiac images in hybrid SPECT/CT systems" *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

7- S. Sajedi, **M. R. Ay**, M. H. Farahani, N. Zeraatkar, H. Arabi, and N. Naderi " Digital signal processing unit for nuclear detection system " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

8- N. Ghazanfari, **M.R. Ay**, S.Sarkar and G.Loudos " The influence of crystal material and size on the performance of partial-rotating dual head small animal PET scanners: Quantitative evaluation using Monte Carlo modeling " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

9- M. Sedighpoor, P. Ghafarian, A. Emami, **M. R. Ay**; " Evaluation of the influence of respiratory motion misalignment between PET and CT data on diagnosis of heart defects using 4D XCAT phantom and STIR reconstruction " *European Association of Nuclear Medicine Annual Congress,* 27-31 October 2012, Milan, Itly. Eur J Nucl Med Mol, *in press*

10- P. Khareti, H. Salighe Rad, A. Fathi and **M.R. Ay,** "Generation of attenuation map for MR-based attenuation correction of PET data in the head area employing 3D short echo time MR imaging ", *Proc. PSMR Conference, Isola de Elba, Italy 26-30 May* , p. 70, 2012.

11- N. Zeraatkar, M. H. Farahani, H. Arabi, S. Sarkar, S. Sajedi, A. Rahmim, and **M. R. Ay,** "Development of image reconstruction code with collimator-detector response function compensation for a preclinical SPECT scanner", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 36, 2012.

12- **M. R. Ay,** "HiReSPECT an in house high resolution SPECT imaging system", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 10, 2012

13- S. Sajedi, M. H. Farahani, H. Arabi, N. Zeraatkar, and **M. R. Ay,** " Implementation of data acquisition board with digital signal processing capability for nuclear imaging and spectrometry devices ", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 39, 2012.

14- A. Mehranian, A. Rahmim, and **M.R. Ay,** "A proximal splitting algorithm for TV-regularized PET image reconstruction", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 43, 2012.

15- H. Arabi, M. H. Farahani, N. Zeraatkar, S. Sarkar, S. Sajedi, A. Rahmim, P. Ghafarian and **M. R. Ay,** " High resolution small animal SPECT: HiReSPECT for preclinical imaging", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 93, 2012.

16- M. Khamesi, A. Kamali Asl, M. Masoudi, N. Zeraatkar, and **M. R. Ay,** " Development of a fully 3D image reconstruction for a pinhole animal SPECT ", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 122, 2012.

17- M. Masoudi, A. Kamali Asl, M. Khamesi, H. Arabi and **M. R. Ay,** " The influence of opening angels and collimator material on the spatial resolution of pinhole collimator in animal SPECT imaging ", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 122, 2012.

18- A. Emami, H. Ghadiri, P. Ghafarian and **M. R. Ay,** " QCT technique optimization by dual energy CT ", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 125, 2012.

19- M. Sedigpoor, **M. R. Ay**, P. Ghafarian, P. Farnia " Quantification of the influence of respiratory motion induced misalignment between PET and CT data on diagnosis of heart disease in cardiac PET/CT imaging ", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 129, 2012.

20- H. Ghadiri, M.B. Shiran, H. Zaidi, H. Soltanian Zadeh and **M.R. Ay,** "The accuracy of dual energy mapping approach in CTAC in presence of low concentration of contract agent", *Proc. Asia Oceania Congress of Nucl. Med. & Biology*, vol. 20 (suppl. 1), p. 60, 2012.

21- A. Mehranian, H. S. Rad, **M. R. Ay**, and A. Rahmim, "3D TV-Based Compressed MR Image Reconstruction Using a Primal Dual Algorithm", *Proc. Intl. Soc. Mag. Reson. Med*., vol. 20, pp. 4228, 2012.

22- A. Rahmim, Y. Zhou, J. Price, J. Tang, L. Lu, **M.R. Ay**, G. Smith, V. Sossi, and D. Wong, "Generalized 4D AB-OSEM direct parametric imaging: application to PiB-PET", *J. Nucl. Med*., vol. 53 (suppl. 1): 313, 2012.

23- A. Emami, H. Ghadiri, **M.R. Ay**, S. Akhlagpour, P. Ghafarian and S. Taghizadeh, "Is percentage error of bone density determined by DEXA technique influenced by density? " *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 88.

24- F. Vedaei, **M.R. Ay**, A. Kamali asl, F. Kalantari " Assessment of the impact of applying attenuation correction on the accuracy of activity recovery in TC99m-ECD brain SPECT of healthy subject using statistical parameter mapping" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 92

25- H. Ghadiri, M. Shiran, **M.R. Ay**, H. Zaidi, H. Soltanian Zadeh" Bone material decomposition by energy resolved CT-based attenuation correction of PET" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 98.

26- M.R. Teimoori, Sh. Akhlagpour, **M.R. Ay**, F. Kalantari and M. Amoui, " Quantification of bremsstrahlung images with respect to post radioemoblization liver dosimetry" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 103

27- N. Ghazanfari, **M.R. Ay**, S. Sarkar and G. Lodous " Assessment of the influence of crystal material and size on the performance of dual head small animal PET scanners" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 108.

28- P. Ghafarian, **M.R. Ay** and J. Hassani " Correction of contrast agent induced srtifacts in CT-based attenuation correction of cardiac PET data using a semi-automated segmentation algorithm" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 110.

29- F. Adibpour, **M.R. Ay**, S. Sarkar and G. Lodous " Photon scatter and penetration in parallel hole collimator in preclinical Gamma Camera: A Monte Carlo study" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 147.

30- A. Anvari, **M.R. Ay** and B. Fallahi " The influence of misalignment between PET and CT images on the accuracy of CT-based attenuation correction in thorax imaging: a simuation study" *3th International Congress of Nuclear Medicine*, Tehran, Iran, 2011, pp 190.

31- A. Rahmim, J. Tang, H. Muhy-ud-Din, **M.R. Ay**, and M. A. Lodge, "Use of optimization transfer for enhanced direct 4D parametric imaging in myocardial perfusion PET", *Society of Nuclear Medicine (SNM) Annual Meeting*, 2011, San Antonio, Texas, USA, *J. Nucl. Med., vol. 52 (Supplement 1): 265, 2011*

32- H. Arabi, N. Zeratkar, **M.R. Ay**, H. Zaidi, "Quantitative Assessment if Inter-Crystal Scatter and Penetration in the PET Subsystem of the FLEX Triumph Preclinical Multi-Modality Scanner", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 40.

33- **M.R. Ay**, "Advances in Multimodality Molecular Imaging Instrumentation", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 77.

34- Z. Anvari, **M.R. Ay**, B. Fallahi, F. Buther "Quantification of Respiratory Induced Artifact in CT-Based Attenuation Correction of PET Data: A Simulation Study", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 79.

35- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, A. Fard Esfahani and H. Zaidi, "Assessment of the Influence of PET and CT Data Misalignment Errors in Cardiac PET/CT Examination: Patient and Phantom Studies", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 81.

36- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, A. Fard Esfahani, A. Rahmim, T.H. Schindler, O. Ratib and H. Zaidi, "Impact of Metal Artifact Reduction on Cardiac FDG-PET/CT Studies in the Presence pf pacemaker and Implantable Cardio Verter Defibrator Leads", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 104.

37- E. Saeedzadeh, A. Abbaspour, S. Sarkar, **M.R. Ay**, H.R. Khosravi, "Accurate 3D Dosimetry for Internal Radiotherapy by Considering the Effect of Nonuniform Activity Distribution ", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 112.

38- F. Adibpour, **M.R. Ay**, S. Sarkar and G. Loudos "Performance Assessment and Optimization of Pixelated Gamma Camera with Small Field of View: A Monte Carlo Study ", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 116.

39- N. Ghazanfari, **M.R. Ay**, S. Sarkar and G. Loudos "Assessment of the Influence of Crystal Material and Size on the Sensitivity of Dual Head Small Animal PET Scanner", *The International Congress of Nuclear Medicine*, Mashhad, Iran, Iranian Journal of Nuclear Medicine, Vol. 18, Supp. 1, 2010, pp. 120.

40- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, B. Fallahi, A. Rahmim, T. Schindler, O. Ratib and H. Zaidi , "Coronary Calcium Score Scan-Based Attenuation Correction in Viability PET Examination: A Feasibility Study", 2010, *The 10th Congress of the World Federation of Nuclear Medicine and Biology (WFNMB 2010)*, Cape Town, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-16.

41- **M.R. Ay**, A. Mehranian, P. Ghafarian, M. Abdoli and H. Zaidi, " Quantification and Correction of Metallic Artifact Arising from Implantable cardiac Pacing Devices in PET/CT Studies: A Phantom Study ", 2010, *The 10th Congress of the World Federation of Nuclear*

Medicine and Biology (WFNMB 2010), Cape Town, South Africa, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-20.
Nominated as one of the best submitted abstracts

42- N. Zeraatkar, **M.R. Ay**, S. Sarkar, A. Rahmim, P. Geramifar, " Quantification of Inter Crystal Scatter and Parallax Events in LYSO-Based Discovery RX PET/CT Scanner: A Monte Carlo Study", 2010, *The 10th Congress of the World Federation of Nuclear Medicine and Biology (WFNMB 2010)*, Cape Town, South Africa, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-158.
Nominated as one of the best submitted abstracts

43- N. Zeraatkar, **M.R. Ay**, A.R. Kamali-Asl, H. Zaidi, " Accurate Modeling for Monte Carlo Based Performance Evaluation of The PET Subsystem of the FLEX Triumph Priclinical PET/CT Scanner Using NEMA NU-4 Standard", 2010, *The 10th Congress of the World Federation of Nuclear Medicine and Biology (WFNMB 2010)*, Cape Town, South Africa, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-163.
Nominated as one of the best submitted abstracts

44- B. Teimourian, **M.R. Ay**, M. Shamsaei Zafarghandi, H. Ghadiri and H. Zaidi, " Virtual Dual Energy CT (VDECT): A Novel Approach for Improved Energy Mapping in CT-Based Attenuation Correction of PET Data", 2010, *The 10th Congress of the World Federation of Nuclear Medicine and Biology (WFNMB 2010)*, Cape Town, South Africa, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-33.

45- E. Saeed Zadeh, S. Sarkar, A. Abbaspour, M.R. Ay, H. Khosravi, G. Lodus, "The Effect of Nonuniform Activity Distribution in Three-Dimensional Dosimetry for Internal Radiotherapy with 131I", 2010, *The 10th Congress of the World Federation of Nuclear Medicine and Biology (WFNMB 2010)*, Cape Town, South Africa, South Africa, World Journal of Nuclear Medicine, Vol. 9, Supp. 1, 2010, pp. S-30.

46- M. Abdoli, **M.R. Ay**, A. Ahmadian, R.A. Dierckx and H. Zaidi "Optimization of weighted virtual sinogram-based metal artifact reduction in CT-based attenuation correction of PET data using a genetic algorithm" *European Association of Nuclear Medicine Annual Congress,* 9-13 October 2010, Vienna, Austria. Eur J Nucl Med Mol Imaging, Vol 37, Suppl. 1, (2010) *in press*

47- M. Abdoli, **M.R. Ay**, A. Ahmadian and H. Zaidi, "Comparative assessment of image- and virtual sinogram-based metal artefact reduction techniques for CT-based attenuation correction in PET", (2009) *Oral presentation* at the *European Association of Nuclear Medicine Annual Congress***,** 10-14 October 2009, Barcelona, Spain. Eur J Nucl Med Mol Imaging, Vol 36, Suppl. 1, *pp* S226.

48- E. Saeed Zadeh, S. Sarkar, A. Abbaspour, M.R. Ay, H. Khosravi, G. Lodus, "Accurate 3D-Dosimetry for Internal Radiotherapy with 131I Using GATE Monte Carlo Code", 9th Iranian Congress of Medical Physics, Tehran, Iran, 2010, pp 116.

49- S. Lashkari, S. Sarkar, **M.R. Ay** and A. Rahmim, "The Effect of Crystal Size on Position Detection Accuracy in PET Block Detectors: A Monte Carlo Study", (2009) *Poster presentation* at the *European Association of Nuclear Medicine Annual Congress***,** 10-14 October 2009, Barcelona, Spain. Eur J Nucl Med Mol Imaging, Vol 36, Suppl. 1, *pp* S409.

50- M. Habibzadeh, **M.R. Ay**, A. Kamali Asl, H. Ghadiri, " The Influence of Patient Miscentering of Patient Dose and Image Noise in Two Commercial CT Scanners", *16th Conference of Biomedical Engineering*, Tehran, Iran, 2010, PP. 158.

51- M. Akbari, **M.R. Ay**, A. Kamali Asl, H. Ghadiri, "Implementation and Comparison of to Empirical Methods for Calculation of MTF in CT"*16th Conference of Biomedical Engineering*, Tehran, Iran, 2010, PP. 155.

52- M. Mollazadeh, , M. Allahverdi, T. Pourfallah, N. Riahi Alam, **M.R. Ay**, " Evaluation of Dose Distribution in Co-60 Machine Using Radicromic Film and Monte Carlo"*16th Conference of Biomedical Engineering*, Tehran, Iran, 2010, PP. 157.

53- M. Zabih Zadeh, **M.R. Ay**, M. Allahverdi, A. Mesbahi, S.R. Mahdavi and M. Shahriari, "Monte Carlo Estimation of Photoneotrons Contamination from High Energy Medical Accelerator in Treatment Room and Maze" *10th Biennial ESTRO Conference on Physics and Radiation Technology for Clinical Radiotherapy,* Maastricht, August 30 – September 3, 2009, *in press*

54- **M.R.Ay**, " Strategies for Attenuation Correction in PET/CT and PET/MRI", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 8.

55- **M.R.Ay**, " Challenges for Planning and Running a PET/CT and Cyclotron Facility", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 10.

56- P. Ghafarian, S.M.R. Aghamiri, **M.R. Ay**, A. Rahmim and H. Zaidi, " CT Based Attenuation Correction in Cardiac PET/CT Using Calcium Score CT Image: A Feasibility Study ", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 9.

57- **M.R.Ay**, M. Shirmohammad, S. Sarkar, A. Rahmim, H. Zaidi " Implementation and comparison of different energy mapping approaches in CT-based attenuation correction of PET", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 51.

58- B. Teimourian, **M.R. Ay**, M. Shamsaei Zafarghandi" Implementation of Dual Energy Mapping Techniques in CT-Based Attenuation Correction Method Using Single Energy Imaging: A Novel Approach for Reducing Patient Dose", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 52.

59- E. Saeedzadeh, S. Sarkar, A. Abbaspour Tehrani-Fard, **M.R. Ay**, H.R. Khosravi " Validation of the GATE Monte Carlo Code in Evaluation of Organ Doses Calculation in Zubal

Voxelized Phantom ", *International Congress of Nuclear Medicine and Molecular Imaging*, Tabriz, Iran, 23-25 September, 2009, pp. 50.

60- **M.R. Ay**, " PET/CT: Site Planning and Shielding Calculation", *The 1st Congress of Radiation Protection in Radiotherapy, Diagnostic and Interventional Radiology*, 19-20 February 2009, Tehran, Iran, 43-44.

61- L. Karimiafshar, N. Riahi Alanm and **M.R. Ay** " Evaluation of polymer gel dosimetry based on MRI imaging for measurement of CTDI in 64 slice CT scanner", *The 1st Congress of Radiation Protection in Radiotherapy, Diagnostic and Interventional Radiology*, 19-20 February 2009, Tehran, Iran, 20-21.

62- M. Shirmohammad, **M.R. Ay**, A. Rahmim A, S. Sarkar and H**.** Zaidi "A novel energy mapping method for attenuation map generation at 511 keV in computed tomography based attenuation correction" (2008) *Oral presentation* at the *European Association of Nuclear Medicine Annual Congress***,** 11-15 October 2008, Munich, Germany. Eur J Nucl Med Mol Imaging, Vol 35, Suppl. 2, S146.
Nominated as one of the best submitted abstracts

63- P. Geramifar, **M.R. Ay**, M. Shamsaii Zafarghandi,G. Lodous, A. Rahmim " Monte Carlo Simulation of The GE LYSO-Based Discovery RX PET/CT Scanner Using GATE: a Validation Study" (2008) *Oral presentation* at the *European Association of Nuclear Medicine Annual Congress***,** 11-15 October 2008, Munich, Germany. Eur J Nucl Med Mol Imaging, Vol 35, Suppl. 2, S175-176.

64- S. Lashkari, S. Sarkar, **M.R. Ay** and A. Rahmim " The Influence of Crystal Depth on Position Detection Accuracy and Detection Efficiency in PET Block Detector: A Monte Carlo Study" (2008) P*oster* at the *European Association of Nuclear Medicine Annual Congress,* 11-15 October 2008, Munich, Germany. Eur J Nucl Med Mol Imaging, Vol 35, Suppl. 2, S337-338.

65- A. Rahmim, J. Tang, M. A. Lodge, S. Lashkari, **M.R. Ay**, R. Lautamaki, B. M. Tsui, and F. Bengel "Improved clinical and quantitative dynamic Rb-82 cardiac imaging with resolution modelling"*, J. Nucl. Med., vol. 49 (Supplement 1): 62P, 2008*

66- M. Shafaee, M.R. Ay and D. Sardari, "Characterization of Scatter and Penetration Using Monte Carlo Simulation in Ga-67 Imaging", 9th ASIA Oceania Congress of Nuclear Medicine and Biology, Oct 31st - Nov 4th, 2008, New Delhi, India, Indian Journal of Nuclear Medicine, Vol 23, p.171

67- **M.R. Ay**, J.H. Bidgoli, S. Sarkar and A. Ahmadian. "Automatic Segmentation of Oral Contrast Enhanced CT Images for Artifact Free Attenuation Correction in PET/CT", *Oral presentation* at the *European Association of Nuclear Medicine Annual Congress*, 13-19 October 2007, Copenhagen, Denmark. Eur J Nucl Med Mol Imaging, Vol 34, Suppl 2, S115.

68- M. Shafaee, M.R. Ay, D. Sardari, "Evaluation of Scatter and penetration in HEGP Collimator in DST Xli Gamma Camera During I131 Imaging", 14th Iranian Nuclear Science Conference, Yazd, Iran, 2007, p.111

69- P. Geramifar, M.R. Ay, M. Shamsaei, "Validation and Performance Evaluation of Discovery Rx whole Body PET/CT Scanner Using GATE, 14th Iranian Nuclear Science Conference, Yazd, Iran, 2007, p.33

70- **M.R. Ay** and H. Zaidi. "Assessment of the impact of x-ray tube voltage on quantitative analysis of neurological PET when using CT-based attenuation correction", In *1st European conference in Molecular Imaging Technology*, Marseille, France, 9-12 May 2006, p. 22.

71- **M.R. Ay** and H Zaidi "Characterization of sources of artefact when using CT-based attenuation correction in PET". In *7th annual congress of the Swiss Society of Nuclear Medicine (SSNM)*, Lausanne, Switzerland, 1-3 June 2006, Nuklearmedizin Vol 45, p. A139.

72- **M.R. Ay,** S. Sarkar, M. Shahriari, and P. Ghafarian. "Estimating of patient dose in abdomen-pelvis CT exam as a function of scan techniques in single and multi-slice speiral CT by Monte Carlo method". In *2th International Conference on Nuclear Science and Technology in Iran*. Shiraz, Iran, 27-30 April 2004, p. 46.

73- **M.R. Ay,** M. Adib, and H. Zaidi. "Development of a Monte Carlo simulation package for scintillation cameras operation in single photon and coincidence imaging mode". In *Annual Congress of the European Association of Nuclear Medicine (EANM03)*. Amsterdam, The Netherlands, 23-28 August 2003, p. S326-S327.

74- **M.R. Ay,** M. Shahriari, S. Sarkar, and P. Ghafarian. "Measurement of organ dose in abdomen-pelvis CT exams as a function of mA, KVp and scanner type by Monte Carlo method". In *3th International Conference of The Effect of Low and Very Low Doses of Ionizing Radiation on Human Health*. Tehran, Iran , 21-23 October 2003, p. 53.

75- **M.R. Ay,** "Image fusion in nuclear medicine". In *The 7th Annual Meeting of Nuclear Medicine*. Tehran, Iran, 2003: p. 45.

76- **M.R. Ay,** "Steps toward building a PET center". In *The 6th Annual Meeting of Nuclear Medicine*. Mashhad, Iran 2002, p. 29.

77- **M.R. Ay,** "Comparison of PET detectors". In *The 6th Annual Meeting of Nuclear Medicine*. Mashhad, Iran 2002, p. 31.

78- **M.R. Ay** and M.E. Ashrafi. "Providing software for PET (Coincidence) 3D simulation using Monte Carlo method". In *The International Conference on Radiation and its Role in Diagnosis and Treatment (FICR2000)*. Tehran, Iran, 14-18 October 2000, p. 51.

Book Chapters

1- **M.R. Ay** and H. Zaidi, "**Analytical and Monte Carlo modeling of x-ray spectra in mammography**", in *Emerging Technologies in Breast Imaging and Mammography*, J.S. Suri,

R.M. Rangayyan, and S. Laxminarayan, Editors. 2006, American Scientific Publishers: Valencia, CA. ISBN: 1-58883-090-X, 2006, pp 25-44.

2- **M.R. Ay, "Introduction to PET and PET/CT systems"**, in *Comprehensive book on Radiology, Nuclear Medicine and Therapy Systems*, J. Shokohi, A.A. Ameri, and H.R. Sagha, Editors. 2003, Andishe Rafi Publisher: Tehran, Iran. pp. 1757-1781.

3- **M.R. Ay, "Cyclotrons in nuclear medicine"**, in *Comprehensive book on Radiology, Nuclear Medicine and Therapy Systems*. J. Shokohi, A.A. Ameri, and H.R. Sagha, Editors. 2003, Andishe Rafi Publisher: Tehran, Iran. pp. 1742-1756.

Developed Packages

1- **M.R. Ay et al.** "Monte Carlo Simulation Package for Scintillation Cameras Operation in Single photon and Coincidence Imaging mode", Presented in *Annual Congress of the European Association of Nuclear Medicine (EANM03)*. 2003. Amsterdam, The Netherlands, Aug. 23-28.

2- **M.R. Ay et al.** "MCNP4C-based Monte Carlo simulator for fan- and cone-beam x-ray CT", Presented in *14th International Conference of Medical Physics (ICMP 2005).* Nuremberg, Germany, Sept. 14-17.

3- **M.R. Ay et al.** "Implementation of an X-ray Spectra Database in Diagnostic Radiology Energy Range Based on all computational Models"

4- **M.R. Ay et al.** "Implementation of an X-ray Spectra Database in Mammography Energy Range Based on all computational Models"

Thesis

1- **M.R. Ay,** "*Monte Carlo and Experimental Assessment of CT-Based Attenuation Correction in PET*", Ph.D. Thesis, Geneva University, Supervisor: PD Dr. H. Zaidi (Geneva University), Advisor: Pr. Sviatoslav Voloshynovskiy (Geneva University). Grade: *Excellent*

2- **M.R. Ay,** "*Monte Carlo Modeling of x-ray Computed Tomography: Application in the Assessment of CT-Based Attenuation Correction in PET/CT systems*", Ph.D. Thesis, Polytechnic University of Technology, Supervisors: Dr. S. Sarkar (Tehran University), Dr. S. Sardari (Polytechnic University), Dr. H. Zaidi (Geneva University). Advisor: Dr. M. Shahriari (Shahid Beheshti University). Grade: *Excellent*

3- **M.R. Ay,** "*3D Monte Carlo Simulation of Coincidence Systems*", M.S. Thesis, Polytechnic University of Technology, Supervisors: Dr. ME.H. Ashrafi (Surry University, UK), Dr. H. Afarideh (Atomic Energy organization of Iran). Grade: 19.5/20

4- **M.R. Ay,** "*Design and Implementation of a Random Number Generator (RNG) for Cryptography*", B.S. Thesis, Shiraz University, Supervisor: M. Masnadi (Shiraz University), H. Vazifedoust (Sagem Representative in Iran: SAIRAN). Garde: 20/20

Thesis Directed:

2011- " Quantification of the influence of misregistration between CT and SPECT images on the accuracy of CT-based attenuation correction of cardiac images in hybrid SPECT/CT systems" *Supervisor*, MSc. Thesis

2011- " Generation of Attenuation Map from MR images for Attenuation-Correction of PET data in Head Area: Focusing on Segmentation of Bone from Air Cavities" *Supervisor*, MSc. Thesis

2010- "Quantification of the influence of respiratory and cardiac motion induced mis alignment between CT and PET data of diagnosis accuracy of hart disease in cardiac PET/CT imaging " *Supervisor*, MSc. Thesis

2010- "Generation of attenuation map for hybrid PET/MRI systems using MRI image segmentation of torso based on bones morphology " *Supervisor*, PhD. Thesis

2010- "Reduction of Respiratory Induced Artifact in PET/CT Imaging Using Virtual Average CT " *Supervisor*, PhD. Thesis

2010- "Improving the Accuracy of Energy mapping algorithm in CT-Based Attenuation Correction of PET data Using Energy Sensitive CT " *Supervisor*, PhD. Thesis

2009- "Design and Performance Evaluation of Small Animal Gamma Camera Detection System Based on Pixelated Crystal Using Monte Carlo Simulation" *Supervisor*, MSc. Thesis

2009- "Modeling and optimization of detection system in multiple head small animal PET scanner using Monte Carlo method " *Supervisor*, MSc. Thesis

2009- " Quantification of Respiratory Induced Artifact in CT- Based Attenuation Correction of PET Data Using NCAT Phantom and Analytic Modeling in Lung Imaging " *Supervisor*, MSc. Thesis

2008- " A Novel Approach for Implementation of Dual Energy Mapping Technique in CT-Based Attenuation Correction Using Single kVP Imaging: A Feasibility Study" *Supervisor*, MSc. Thesis

2008- "Monte Carlo Characterization of Scattered Radiation in 64 Volumetric CT Using GATE" *Supervisor*, MSc. Thesis

2008- " Monte Carlo Modeling of RRPET Using GATE" *Supervisor*, MSc. Thesis

2008- "Noise Reduction on Ultra Low Dose CT images " *Supervisor*, MSc. Thesis

2008- "Dual Energy CT Imaging: Application in CT Based Attenuation Correction in PET ", *Supervisor*, MSc. Thesis

2008- "Monte Carlo assessment of the Influence of X-Ray Anode Surface Roughness on X-ray Spectra" *Supervisor*, MSc. Thesis

2008- "CTDI Measurement using gel dosimetry in 64 slice CT scanner", *Supervisor*, MSc. Thesis.

2008- "Monte Carlo Assessment of photonutron contamination in Medical linear Accelerators", *Supervisor*, PhD. Thesis.

2008- "Reduction of Dental Filling Artifact in CT-Based Attenuation Correction of PET Images", *Supervisor*, MSc. Thesis.

2007- "Comparative assessment of different energy mapping methods for generation of attenuation map at 511 keV from CT images in hybrid PET/CT systems", *Supervisor*, MSc. Thesis.

2007- "Optimization of dedicated gamma camera for high performance breast tumor imaging using Monte Carlo simulation", *Supervisor*, PhD. Thesis.

2007- "Targeted radiation treatment using Monte Carlo simulation", *Advisor*, MSc. Thesis.

2007- "Calculation of scatter profile in 64 slice CT scanners using experimental measurement and Monte Carlo simulation", *Supervisor*, MSc. Thesis.

2007- "Improvement of image quality and patient's dose reduction in 64 slice CT scanner by optimization of x-ray spectra filtration using experimental measurement and Monte Carlo simulation", *Supervisor*, MSc. Thesis.

2006 - "Monte Carlo assessment of the impact of inter crystal scattering on PET scanner's PSF as a function of crystal size and material", *Supervisor*, MSc. Thesis.

2006- "Evaluation of Scatter and Septal Penetration Components in LEGP and HEGP Collimator Using Monte Carlo Simulation", *Supervisor*, MSc. Thesis.

2006 - "Monte Carlo modeling and performance prediction of slit-slat collimator in low energy SPECT imaging using GATE", *Supervisor*, MSc. Thesis.

2006 - "Monte Carlo investigation of Time-of-Flight benefits for fully 3D PET", *Supervisor*, MSc. Thesis.

2006 - "Evaluation of the Accuracy of 3D MRI-based Polymer Gel Dosimetry (MRPD-3D) on Srereotactic Radiosurgery (SRS) Using Monte Carlo Simulation in Inhomogeneous Head Phantom"*, Advisor*, PhD. Thesis.

Research Grants

2011- "Proposing a new energy mapping method in PET/CT using energy sensitive CT with capability of segmenting the contrast agent from bone tissue " *Research Center for Science and Technology in Medicine.*

2011- " Quantification and Reduction of Respiration Motion Induced Artifacts in CTAC in PET/CT Systems using Virtual Average CT in Different Respiratory Phases" *Research Center for Science and Technology in Medicine.*

2011- "Metal artifact reduction in X-ray Computed Tomography using Iterative Methods" *Research Center for Science and Technology in Medicine.*

2010- "Quantification of Artifcat arising from Misalignment between PET and CT Images in Myocardium PET/CT Imaging Using Experimental Measurement and Analytic Modeling" *Research Center for Science and Technology in Medicine.*

2010- " Coronary calcium score scan-based attenuation correction in cardiovascular PET imaging" *Research Center for Science and Technology in Medicine.*

2010- "Quantification of Metalic Leads Artifact from Stimulator Cardiac Devices in Cardiac Perfusion and Viability PET/CT Imaging and Performance Evaluation of Commercial MAR Software" *Research Center for Science and Technology in Medicine.*

2009- "Feasibility study on using single energy CT image for the purpose of dual energy mapping technique with minimum patient dose for generation of attenuation map in 511 keV in PET/CT Systems" *Research Center for Science and Technology in Medicine.*

2009- "Quantification of Parallax and Inter-Crystal Scattering in Commercial PET Systems for Improving Spatial Resolution and Enhancing Image Quality" *Research Center for Science and Technology in Medicine.*

2009- "Reduction of Dental Filling Artifact in CT-Based Attenuation Correction in Hybrid PET/CT Imaging" *Research Center for Science and Technology in Medicine.*

2009- "Quantification of CT-based Attenuation Correction Metalic Artifacts in Whole Body PET/CT Imaging in the Presence of Cardiac Stimulation Batteries: A Phantom Study" *Research Center for Science and Technology in Medicine.*

2008- " Design, development and implementation of a clinical QCT system using CT scan images with DICOM format", *Tehran University of Medical Sciences*.

2008- "Designing and Implementation of Hardware and Software for Accurate Measurement of Contrast and Resolution of Images in Spiral CT Scan", *Research Center for Science and Technology in Medicine.*

2008- "The influence of patient miscentering on patient dose and image noise in computed tomography ", *Research Center for Science and Technology in Medicine.*

2008- "Evaluation of Time of Flight benefits for fully 3D PET using Monte Carlo simulation", *Research Center for Science and Technology in Medicine.*

2007- "Calculation of scattered radiation profile in 64 slice CT scanners using Monte Carlo simulation and experimental measurement", *Tehran University of Medical sciences.*

2007- "Comparative assessment of different energy mapping methods for generation of attenuation map at 511 keV from CT images in hybrid PET/CT systems and quantitative analysis of final images", *Research Center for Science and Technology in Medicine.*

2007- "Improvement of image quality and patient's dose reduction in 64 slice CT scanner by optimization of x-ray spectra filtration using experimental measurment and Monte Carlo simulation", *Research Center for Science and Technology in Medicine.*

2006 - "Automatic segmentation of oral contrast agent in CT images: Application in CT-based attenuation correction", *Research Center for Science and Technology in Medicine.*

2006 - "Development of an x-ray spectra database in diagnostic radiology energy range using all computational models", *Research Center for Science and Technology in Medicine.*

2006 - "Development of an x-ray spectra database in mammographic energy range using all computational models", *Research Center for Science and Technology in Medicine.*

Review Boards

- Scientific Reviewer, German Research Foundation (Deutsche Forschungsgemeinschaft)
- Scientific Reviewer, Journal of Medical Imaging
- Scientific Reviewer, Medical Physics *Official Journal of the American Association of Physicists in Medicine* (AAPM).
- Scientific Reviewer, Computer Methods and Programs in Biomedicine.
- Scientific Reviewer, Journal of Cancer Research and Therapeutics
- Scientific Reviewer, Current Medical Imaging Reviews
- Scientific Reviewer, Physics in Medicine and Biology.
- Scientific Reviewer, Progress in Biophysics and Molecular Biology
- Scientific Reviewer, Iranian Journal of Nuclear Medicine.
- Scientific Reviewer, Iranian Journal of Medical Physics.
- Scientific Reviewer, Iranian Journal of Radiation Research.
- Scientific Reviewer, Iranian Journal of Radiology.

Membership

- Member of Institute of Electrical and Electronics Engineers (IEEE)
- Member of Institute of Physics and Engineering in Medicine (IPEM)
- Member of Iranian Association of Medical Physics (IAMP)
- Fellow Member of International Union Against Cancer (UICC)
- Member of Consortium of Computational Human Phantoms (CCHP)
- Member of Iranian Association of Nuclear Medicine
- Member of Iranian Association of Biomedical engineering
- Member of International Organization for Medical Physics (IOMP)
- Member of European Federation of Organizations of Medical Physics (EFOMP)
- Member of European Society for Engineering and Medicine

Research

- MRI-based attenuation correction in PET/MRI

- Preclinical Imaging
- Multimodality Imaging
- High resolution animal imaging
- CT-based attenuation correction in PET and SPECT
- Monte Carlo simulation of imaging systems
- Monte Carlo Simulation of CT Scanner Using MCNP
- Monte Carlo simulation of X-ray spectra
- Monte Carlo Simulation of PET Scanner by Eidolon
- Development of Monte Carlo Simulation Package
- Image Reconstruction
- Medical Image Fusion
- Quantitative Analysis of PET and PET/CT images
- Quality Control of Nuclear Medicine Imaging systems
- Shielding Design

Professional Experience

2008 to present *Deputy of Education*
Department of Medical Physics and Biomedical Engineering
Tehran University of Medical Sciences, Tehran, Iran

2008 to 2010 *Deputy of Research Affairs*
Department of Medical Physics and Biomedical Engineering
Tehran University of Medical Sciences, Tehran, Iran

2008 to present *Deputy of International Affairs*
Research Center for Science and Technology in Medicine
Tehran University of Medical Sciences, Tehran, Iran

2008 to present *Head of Medical Imaging Systems Research Group*

Research Center for Science and Technology in Medicine
Tehran University of Medical Sciences, Tehran, Iran

2004 to present *Assistant Researcher*
PET Instrumentation & Neuroimaging Laboratory
Geneva University Hospital, Geneva, Switzerland

2005 to 2006 *Medical Image Fusion expert*
Collaboration with radiotherapy department, Geneva University Hospital, Geneva, Switzerland

1997 to 2004 *General Electric Healthcare Authorized Agent in Iran*

- **2001 to 2004** NM/PET group supervisor
  - Installation of Gamma Camera in Lahore, Pakistan (1 Unit)
  - Installation of Gamma Camera in Iran (5 Unit)
  - Service and maintenance of Gamma camera (10 Unit)
- **1999 to 2001** Vascular group supervisor
  - Installation of LC+ Cardiac Angiography System in Iran (4 Unit)
  - Installation of LCA Peripheral Angiography System in Iran (1 Unit)
  - Service and maintenance of vascular systems (11 Unit)
- **1997 to 1999** CT scanner group service senior engineer
  - Installation of Spiral and Conventional CT scanner in Iran (20 Unit)
  - Service and maintenance of CT scanner systems (70 Unit)

Training Courses Taken

15th Aug to 19th Aug 2011 GE Healthcare Technologies, Waukesha, USA
PET discovery 600 series service training

8th Aug to 12th Aug 2011 GE Healthcare Technologies, Waukesha, USA
PET basic service training

1th Aug to 5th Aug 2011 GE Healthcare Technologies, Waukesha, USA
CT LightSpeed VCT full service training

18th July to 29th July 2011 GE Healthcare Technologies, Waukesha, USA
CT LightSpeed Pro full service training

14th Feb to 25th Feb 2011 GE Healthcare Technologies, Uppsala, Sweden
Minitrace Cyclotron service training

8th Feb to 11th Feb 2011 GE Healthcare Technologies, Uppsala, Sweden
Tracelab Mx FDG service training

24th Jan to 28th Jan 2011 University of Tubingen, Tubingen, Germany
Small animal imaging workshop

5th May to 9th May 2008 Accuray Incorporation Europe- Paris- France
Cyberknife Training Program

25th Oct. to 17th Nov. 2002 GE Medical Systems - Lausanne, Zurich - Switzerland
PET and PET/CT Maintenance and Quality Control (Job Training)

15th Jul. to 27th Jul. 2002 GE Medical Systems – Paris - France
Gamma Camera (DST-Xli) Maintenance and Quality Control

2th Jun. to 28th Aug. 2002 Isiran Institute – Tehran – Iran
Unix Administration (24 Hours)

14th Jan. 10th Mar. 2002 Isiran Institute – Tehran – Iran
TCP/IP (24 Hours)

2th Feb. 7th Feb. 2002 Atomic Energy Organization – Karaj – Iran
Advance Monte Carlo (MCNP) training Course (50 Hours)

25th Nov. 9 Dec. 2001 GE Medical Systems – Paris – France
Gamma Camera (DSX/DS7) Maintenance and Quality Control

25th Jun. to 6th Jul. 2001 GE Medical Systems – Paris – France
Gamma Camera (DSXi) Maintenance and Quality Control

5th Jun. to 9th Jun. 2001 TPP CO. (GE Medical Systems Authorized Agent) – Tehran – Iran
Vascular Systems Maintenance (Advantx LC+ & LCA)

10th Nov. to 15th Nov. 2000 ElmoSanat University – Tehran – Iran
Monte Carlo (MCNP) Training Course (50 Hours)

22th Sep. to 5th Nov. 2000 Isiran Institute – Tehran – Iran
Unix Operating System (40 Hours)

International and Local Lectures

"Preclinical Imaging and Imaging Technologies", 3th International Congress of Nuclear Medicine, Tehran, Iran, 2011.

"Medical Cyclotron: Physics and Instrumentation", 3th International Congress of Nuclear Medicine, Tehran, Iran, 2011.

"Basic Instrumentation and Quality Control for Nuclear Cardiology", International Atomic Energy Agency, Regional Training Course on Imaging in ischemic heart disease and cardiac failure for advanced users, Teheran, Islamic Republic of Iran 27 November – 1 December 2010.

"The Rule of QC and QA in Medical Imaging", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Science and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"New developments in Computed Tomography Imaging", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Acience and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"New Development in Functional Imaging Instrumentation ", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Acience and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"Hybrid Imaging (PECT/CT and SPECT/CT)", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Acience and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"Basic Principal of Radiosurgery", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Acience and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"Basic Principal of Radiosurgery Robotic System (CyberKnife)", Workshop on Medical Imaging and Radiosurgery Systems, 4-9 October, Research Center for Acience and Technology, Tehran University of Medical Sciences, Tehran, Iran.

"New Developments in Functional Imaging Instrumentation", 12th Iranian Nuclear Medicine Congress, Sari, Iran, 2008.

"Future Trend in Functional Imaging Instrumentation", Shariati Hospital, Tehran, Iran, 22 February 2008

"Sources of Error and Artifact in PET/CT", Shariati Hospital, Tehran, Iran, 22 February 2008

"Factors Affecting Image Quality in PET", Shariati Hospital, Tehran, Iran, 26 December 2007

"How to Configure a PET/CT and Cyclotron Facility", Shariati Hospital, Tehran, Iran, 22 November 2007

"**Basic Principal of PET Imaging and Radiopharmacutical Production**", Shariati Hospital, Tehran, Iran, 25 October 2007

"***Principal of PET and PET/CT systems***", General Electric Healthcare Technologies training course, Dubai, UAE, 2006.

"***Quality Control of Gamma camera and SPECT***", International Regional Training Course for Nuclear Medicine Technologists, Organized by IAEA and AEO of Iran - Tehran – Iran – 2002.

"***Medical Imaging & Therapy Systems Overview"***", The First Workshop on Medical Imaging and Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***Conventional and Digital Radiology and Mammography Systems***" , The First Workshop on Medical Imaging And Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***Multi Slice Spiral CT and EBCT systems***" , The First Workshop on Medical Imaging And Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***Cyclotron and Radiopharmaceutical Production***" , The First Workshop on Medical Imaging And Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***PET and PET/CT System***" , The First Workshop on Medical Imaging And Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***Basic Principal of Therapy systems(LINAC& Gamma Knife)***" , The First Workshop on Medical Imaging And Therapy Systems, organized by TPP Co, GE Medical Systems Iran Authorized Distributor, in Association with Tehran University, Iranian Association of Medical Physics and Research center for science and technology in Medicine, Teheran- Iran,13-18 Sep 2003.

"***Physical Aspect of Gamma Camera in Use***", The 6th Annual meeting of Nuclear Medicine – Mashhad – Iran – 2002.

Computer Skills

- Programming with C++
- Programming with Fortran
- Matlab
- Programming with Assembly Language (8051)
- Unix
- Windows
- MCNP
- Monte Carlo Packages in NM/PET

*** References will be submitted on Request**