

## *Curriculum Vitae*

### **Personal Information:**



Full Name: Ahmad Esmaili Torshabi,  
*PhD of Proton Radiotherapy*  
Date of Birth: 30th March 1979  
Place of Birth: Rafsanjan, Iran  
Nationality: Iranian  
Marital status: Married

Address:  
Medical Radiation Division,  
Dept. of Computer and Electrical Engineering,  
Graduate University of Advanced Technology,  
Haftbagh St. 7631133131, Kerman, Iran

Academic E-mail Address: [a.esmaili@kgut.ac.ir](mailto:a.esmaili@kgut.ac.ir)  
Gmail: [ahmad4958@gmail.com](mailto:ahmad4958@gmail.com)

Mobile: +989386730223

### **Educations and full time Positions:**

- 2011-Present     Assistant Professor, Medical Radiation Division, Dept. of  
Computer and Electrical Engineering, Graduate University of Advanced  
Technology, Haftbagh St., Kerman, Iran
- 2011-2014       Assistant Professor, Radiology Division, Kerman University of  
Medical Sciences, Haftbagh St., Kerman, Iran

- 2009-2011      Researcher, Bioengineering Unit, National Center for Oncological Hadrontherapy (Fondazione CNAO; Italian abbreviation), Pavia, Italy
- 2006-2009      Ph.D. Proton Therapy, Department of Quantum Science and Energy Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan
- 2004-2006      M.Sc. Medical Radiation Engineering, Graduate School of Engineering, Shiraz University, Shiraz, Iran
- 1998-2003      B.Sc. Electronics Engineering, Graduate School of Engineering, Bahonar University of Kerman, Kerman, Iran

**Obtained Research Grants & Fellowships:**

- 2016      Research grant, Dept. of Computer and Electrical Eng. Graduate University of Advanced Technology, Kerman, Iran
- 2011      KGUT academic welcome grant, Dept. of Computer and Electrical Eng. Graduate University of Advanced Technology, Kerman, Iran
- 2009      Marie Curie fellowship, EU. PARTNER Project, Fondazione CNAO, Pavia, Italy
- 2006      Ph.D. Monbukagakusho fellowship, Tohoku University, Sendai, Japan

**Current research activities:**

- 1- Motion data analysis of patients with thoracic tumors treated with Cyberknife Synchrony at Saphir Radiosurgery centers in Germany; a collaboration work
- 2- Study on Inter-Intra fractional motion error compensation for real time tumor tracking at robotic radiotherapy
- 3- Study on feature based deformable registration of medical images for respiratory signal extraction applicable at SBRT
- 4- Study on the advantages of nonlinear based models for tumor delineation and real time tumor motion tracing
- 5- Study on tumor motion effects on prescribed dose distribution at proton therapy and monitoring proton beam range using in-beam PET strategy
- 6- Studying on implementing different strategies of spot scanning techniques in proton therapy
- 7- Studying on medical image registration based on quadtree decomposition technique as image similarity tool

- 8- Study on images fusion (multimodality functional and anatomical imaging system) based on image registration techniques for tumor border extraction
- 9- Monte Carlo simulation studies on physical properties of CdZnTe as compound semiconductor detectors in collaboration with Dept. of Physics, Surrey University, UK

## **Publications:**

**A. Esmaili Torshabi**, Andrea Pella, Marco Riboldi and Guido Baroni., “Targeting Accuracy in Real-Time Tumor Tracking via External Surrogates: a Comparative Study,” *Technology in Cancer Research and Treatment*; vol. 9(6), pp. 551-562, Dec. 2010

**A. Esmaili Torshabi**, “Investigation of the Robustness of Adaptive Neuro-Fuzzy Inference System for Tracking Moving Tumors in External Radiotherapy” *Australasian Physical & Engineering Sciences in Medicine*, vol. 37(4), pp. 771-778, Nov. 2014

**A. Esmaili Torshabi**, “Investigation of Tumor Motion Influence on Applied Dose Distribution in Conventional Proton Therapy vs. IMPT; a 4D Monte Carlo simulation Study ” *International Journal of Radiation Research*, vol. 11(4), pp. 225-231, Oct. 2013

**A. Esmaili Torshabi**, Marco Riboldi, Abbasali Imani Fooladi, Seyed Mehdi Modarres and Guido Baroni., “An adaptive fuzzy prediction model for real time tumor tracking in radiotherapy via external surrogates,” *Journal of Applied Clinical Medical Physics*; vol. 14, pp. 102-114, 2013

**A. Esmaili Torshabi**, Atsuki Terakawa, Keizo Ishii, et al., “Development of an Adjustable Beam Flattening System for modification of Passive Beam Delivery in Proton therapy,” *Nuclear Instruments and Methods in Physics Research, Section A*, vol. 615, pp. 138-141, March 2010

**A. Esmaili Torshabi**, A. Terakawa, K. Ishii, et al., “A fundamental study on beam flattening based on compact double scatterer applicable to rotational beam irradiation system in the Proton therapy facility at CYRIC, Tohoku University,” proceeding of ISORD-5 conf. *Prog. Nucl. Sci. Technol.*, vol. 1, pp. 509-512, Kyushu Japan, July 15-17, 2009

**A. Esmaili Torshabi**, L. Ghorbanzadeh, “A study on stereoscopic X-ray imaging dataset on the accuracy of real time tumor tracking at external surrogates radiotherapy” *Technology in Cancer Research & Treatment*, vol. 16(2), pp. 167-177, Apr. 2017

**A. Esmaili Torshabi**, “Different Aspects of Fuzzy Logic at Image-Guided Radiotherapy” (Submitted to *Iranian Journal of Fuzzy Systems*)

L. Ghorbanzadeh, **A. Esmaili Torshabi**, J. Soltani Nabipour, M. Ahmadi Arbatan, “Development of a Synthetic Adaptive Neuro-fuzzy Prediction Model for Tumor Motion

Tracking in External Radiotherapy by Evaluating Various Data Clustering Algorithms” *Technology in Cancer Research and Treatment*; vol. 15(2), pp. 334-347, 2016,

M. Taghipour, **A. Esmaili Torshabi**, “The perturbation effect of implanted clip on 3D dose distribution with a feasibility study on its optimum location at external beam radiotherapy” (Submitted to *Australian Physical and Engineering Science in Medicine Journal*)

G. Barzgarnehad, **A. Esmaili Torshabi**, “The response of CZT compound semi-conductor detector against photons by efficiency calculation; a micro dosimetry simulation study” (Submitted to *International Journal of Radiation Research journal*, Under Revision 2017).

S.A. Dastyar, **A. Esmaili Torshabi**, O. Blanck, “An assessment on the quality and quantity factors of motion datasets in real time tumor tracking radiotherapy with external surrogates” (Submitted to *Physic in Medicine and Biology journal*).

S. Nankali, **A. Esmaili Torshabi**, P. Samadi Miyandoab, A feasibility study on ribs as anatomical landmarks for motion tracking of lung and liver tumors at external beam radiotherapy, *Technology in Cancer Research and Treatment*, vol. 16(1), pp. 99-111, Feb. 2017

S. Nankali, **A. Esmaili Torshabi**, P. Samadi Miandoab, A. Baghizadeh., ”Investigation on performance accuracy of different external surrogates in real time tumor tracking at external beam radiotherapy” *Frontier in Biomedical Technologies*, vol. 2(2), pp. 381-387, 2015

S. Nankali, **A. Esmaili Torshabi**, Payam Samadi Miandoab, Amin Baghizadeh., ”Optimum location of external markers using feature selection algorithms for real-time tumor tracking in external-beam radiotherapy, a virtual phantom study” *Journal of Applied Clinical Medical Physics*, vol. 16 (1), pp. 221-233, 2016

L. Ghorbanzadeh, **A. Esmaili Torshabi** “Investigation the performance of adaptive neuro-fuzzy inference system for brain tumor delineation using expectation maximization cluster method; a feasibility study”, *Frontiers in Biomedical Technologies*, vol. 3(1-2), pp. 8-19, 2016

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali. "2D and 3D Optical flow based interpolation of the 4DCT image sequences in the external beam radiotherapy." *Frontiers in Biomedical Technologies*, vol. 2, pp. 404-413, 2015

M. Nakhostin, **A. Esmaili Torshabi**, “The influence of electron track lengths on the  $\gamma$ -ray response of compound semiconductor detectors” *Nuclear Instruments and Methods in Physics Research*, vol. 797, pp. 255-259, 2015

S. Parandeh, **A. Esmaili Torshabi**, “A study on robustness of various deformable image registration algorithms on image reconstruction using 4DCT thoracic images” *Journal of Biomedical Physics and Engineering*, Accepted, DOI: org/10.22086/jbpe.v0i0.377

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali, M. Rezai “The Robustness of Various Intelligent Models in Patient Positioning at External Beam Radiotherapy” *Frontiers in Biomedical Technologies*, vol. 2(1), pp. 347-357, 2015

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali, M. Rezaei Raeini.” A simulation study on patient setup errors in external beam radiotherapy using an anthropomorphic 4D phantom” *Iranian Journal of Medical Physics*, vol. 13(4) 276-288, 2017

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali. “Extraction of respiratory motion signal based on image clustering and intensity parameters at radiotherapy with external beam; a comparative study” *Journal of Biomedical Physics and Engineering*, vol. 6(4), pp. 253-264, Dec. 2016

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali. "Investigation of the optimum location of external markers for patient set-up accuracy enhancement at external beam radiotherapy." *Journal of Applied Clinical Medical Physics*. vol. 8; (18)6, pp. 32-43, Nov. 2016

P. Samadi Miandoab, **A. Esmaili Torshabi**, S.Parandeh. "A feasibility study of marker-less method based on image registration technique and intelligent models for inter and intra-fraction motion error in radiotherapy." *Australasian Physical & Engineering Sciences in Medicine*, (submitted March, 2018).

Pella A.,Cambria R., Riboldi M., Jerezek-Fossa BA., Fodor C., Zerini D., **Esmaili Torshabi A.**, Cattani F., Garibaldi C., Pedroni G., Baroni G., Orecchia R., “Use of machine learning methods for prediction of acute toxicity in organs at risk following prostate radiotherapy” *Medical Physics*, vol. 38, pp. 2859-2868, 2011

H. Sabet, K. Ishii, S. Matsuyama, Y. Kikuchi, Nakazawa, **A. Esmaili Torshabi** and H. Yamazaki, “A method to modify coordinates of detectors in positron emission tomography system” *Nuclear Instruments and Methods in Physics Research; Section A*, vol. 600, pp. 678-682, 2008

*Note: acceptance letter of In-Press articles can be sent, if needed.*

## **Conferences and Meetings:**

**A. Esmaili Torshabi**, M. Riboldi, A. Pella, G. Baroni,”The Effect of Moving Targets on the Applied Dose Distribution in Conventional Proton Therapy vs. IMPT; a Monte Carlo Simulation Study,” *An international workshop in Monte Carlo computational methods in*

*radiation track simulation and applications in physical, biological, and medical sciences*, November 9-12, 2010, Stockholm, Sweden

**A. Esmaili Torshabi**, M. Riboldi, A. Pella, G. Baroni, “A fuzzy prediction model approach for real time tumor tracking in radiotherapy,” *38<sup>th</sup> Annual Meeting of the European Radiation Research Society*, September 5-9, 2010, Stockholm, Sweden

**A. Esmaili Torshabi**, A. Terakawa, K. Ishii, et al., “A CT-based Monte Carlo dose calculations for proton therapy using a new interface program,” *International Conference on Medical Information Systems Engineering*, May 27-29, 2009, Tokyo Japan

**A. Esmaili Torshabi**, A. Terakawa, K. Ishii, et al., “A fundamental study on beam flattening based on compact double scatterer applicable to rotational beam irradiation system in the Proton therapy facility at CYRIC, Tohoku University,” *The Fifth International Symposium on Radiation Safety and Detection Technology (ISORD-5)*, Kyushu Japan, July 15-17, 2009

**A. Esmaili Torshabi**, A. Terakawa, K. Ishii, et al., “Dose distribution calculation of proton beam with Monte Carlo method using a new interface program,” *2008 Fall meeting of Atomic Energy Society of Japan (AESJ)*, Kochi Japan, September 4-6, 2008

**A. Esmaili Torshabi**, A. Terakawa, K. Ishii, et al., “Modification of beam intensity on target volume employing an adjustable beam flattening system in proton therapy,” *2009 Fall meeting of Atomic Energy Society of Japan (AESJ)*, Tohoku University, Sendai Japan, September 16-18, 2009

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali, M. Rezaei raeini “Optical flow based interpolation of temporal image at external beam radiotherapy” 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as oral presentation

P. Samadi Miandoab, **A. Esmaili Torshabi**, M. Rezaei raeini “Extraction of respiratory motion signal using image registration and segmentation at external beam radiotherapy” 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as poster

P. Samadi Miandoab, **A. Esmaili Torshabi**, S. Nankali, M. Rezaei raeini “Using various intelligent models in patient positioning at external beam radiotherapy” 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as poster

A. Ebrahimi, **A. Esmaili Torshabi**, “A quantitative assessment of intra-fractional tumor motion and deformation error on planned dose at conventional proton therapy” International Conference on Translational Research in Radio-Oncology | Physics for Health in Europe ICTR-PHE, CICE Geneva Switzerland, 15-19 February 2016

S. Nankali, **A. Esmaili Torshabi**, P. Samadi Miandoab, A. Baghizadeh "Investigation effect of the inter-intra fraction motion errors in the external beam radiotherapy" 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as oral

S. Nankali, **A. Esmaili Torshabi**, P. Samadi Miandoab, A. Baghizadeh "Investigation location of the external markers in the accuracy of the tumor tracking in the external beam radiotherapy" 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as poster

S. Parandeh, **A. Esmaili Torshabi**, "Simulation of active and passive dose delivery systems used at proton therapy" 11th International Medical Physics Conference of Iran, 6-7 November 2014

S. Parandeh, **A. Esmaili Torshabi**, "Comparison of medical image registration techniques for image interpolation applicable at external beam radiotherapy" 11th International Medical Physics Conference of Iran, 6-7 November 2014

L. Ghorbanzadeh, **A. Esmaili Torshabi** "Medical Image Segmentation and Tumor Definition Using Clustering Algorithms" 11th International Medical Physics Conference of Iran, 6-7 November 2014, accepted as oral

G. Barzgarnejad, **A. Esmaili Torshabi** "An Investigation on the performance of CZT Compound Semi-Conductor Detector in Front of Photon source; a Micro-dosimetry Simulation study" 2<sup>nd</sup> National Conference of Technology, Energy and Data on Electrical & Computer Engineering, Tehran-Iran, 2-3 June 2016, accepted as oral

Kh. Mirzakhani, **A. Esmaili Torshabi**, M. Taghipour, Ar. Dastyar "Design and Implementation of a novel prediction model for real time tumor tracking at external radiotherapy" The International Conference on New researches at Engineering Sciences, Tehran-Iran, 25-26 May 2016, accepted as oral,

M. Taghipour, **A. Esmaili Torshabi**, Kh. Mirzakhani, Ar. Dastyar "The effect of implanted fiducial on 3D dose distribution at Hadron-therapy" The International Conference on New researches at Engineering Sciences, Tehran-Iran, 25-26 May 2016, accepted as oral, *chosen as best presentation with honored certificate*

Riboldi M, Gianoli C, **Torshabi AE**, Pella A, Baroni G., "Breathing phase detection and motion monitoring for 4D treatment planning and delivery" *4D Treatment Planning Workshop*, December 9-10, 2010, GSI, Darmstadt, Germany

V. Moslemi, **A.E. Torshabi**, R. Faghihi, S. Mehdizadeh, K. Haddad, M.A. Mosleh-Shirazi, "Design and Implementation of Interface Software to Produce MCNP4C Geometry Input File From Tomography Images and Comparison of Dose in Brachytherapy between the Interface Software and Standard Monte Carlo Simulation," *Proceedings of the 6<sup>th</sup> Congress of the Iranian Radiographic Sciences Association*,

Shiraz, Iran, 93 (2008)

Pella A., Riboldi M., Seregni M., **Esmaili Torshabi A.**, Pedotti A., Orecchia R., Baroni G. "Preliminary study of a novel external-internal correlation model for motion mitigation in particle therapy," *Annual PTCOG 50 meetnig*, May, 08-14, 2011, Philadelphia, America,

## **Book Chapters**

Marco Riboldi, Matteo Seregni, Andrea Pella, **Ahmad Esmaili Torshabi**, Guido Baroni, "Real-time tuomr targeting in externl beam radiotherapy," *Tumor Targeting: New Technologies and therapies*, Publication date: 1<sup>st</sup> quarter 2011, NOVA Science Publishers Inc., NY 11788

**Ahmad Esmaili Torshabi**, Marco Riboldi, Andrea Pella, Ali Negarestani, Mohamad Rahnama and Guido Baroni, A clinical Application of Fuzzy Logic, "*Fuzzy Logic*" ISBN 979-953-307-578-4, INTECH open access publisher, May 2011

**Ahmad Esmaili Torshabi** and Amirreza Dastyar, Book chapter title: "*Radiotherapy of breast cancer with an overview to its motion issue during treatment*" Accepted at SM book publishing group, In-Press (Nancy Hayes: stt.ebooks@esciencemedicine.com)

**Ahmad Esmaili Torshabi** and Amirreza Dastyar, Book chapter title: "*motion challenge of thoracic tumors at radiotherapy by introducing available compensation strategies*" Book title: Radiotherapy, ISBN: 978-953-51-5126-5, INTECH open access publisher, 17 May 2017, DOI: 10.5772/67444

**Ahmad Esmaili Torshabi**, Payam Samadi, Saber Nankali "Physical Principles in radiotherapy of Dynamic Tumors, (In Farsi, Under preparation)

## **Skills:**

Proficient in Programming such as FORTRAN, MATLAB and LabVIEW software packages

Proficient in medical images processing and related tools such as ImageJ

Proficient in the dose distribution calculations of charge particles with Monte Carlo FLUKA code

Experienced in the use of the detector systems in Proton therapy for 3D does profile measurement

Working with the Computational and Data analysis softwares such as Excel and Peakfit



## Attendance in Advanced International Workshops on Radiotherapy

1. Hadron Therapy, Today and Tomorrow and GRID Technology, 22-26 Feb. 2010, CERN Geneva, Switzerland (with official certification)
2. Radiobiology Course 29 Aug.-2 Sep. 2010, Karolinska Institute, Stockholm, Sweden (with official certification)
3. Treatment Planning, 19-24 Feb. 2011, Wiener Neustadt, Vienna, Austria (with official certification)

## Teaching Experiences:

**2012-2013** PhD course: **The Principles of Charge Particle Accelerators**, (Bahonar University, Kerman, Iran)

**2011-Present** M.Sc courses: **The Principles of Radiotherapy, Medical Imaging Systems, Health Physics, Dosimetry of Ionizing Radiation, The Principles of Charge Particle Accelerators, Radiation measurements and detections, Radiation Shielding and its application in medicine** (Graduate University of Advanced Technology, Kerman, Iran)

**2011-2014** B.S courses: **Computerized Tomography, The Principles of Diagnostic Physics, Ultrasound-Based Imaging System, Quality Control and Quality Assurance of Medical Imaging Systems, Basic Physics**, (Radiology Division, Kerman University of Medical Sciences, Kerman, Iran)

## Articles Derived from MSc theses under my supervision

Student name	MSc Thesis Title	Article(s) derived from thesis
L.Ghorbanzadeh	Development of a Synthetic Neuro-Fuzzy Based Prediction Model for Tumor Motion Tracking in Radiotherapy	L. Ghorbanzadeh, <b>A. Esmaili Torshabi</b> , J. Soltani Nabipour, M. Ahmadi Arbatan, <i>Technology in Cancer Research and Treatment</i> ; DOI: 10.1177/1533034615571153,
S. Nankali	The Effect of the Number and Location of Internal/External Markers at Tumor Motion Tracking in External Radiotherapy	S. Nankali, <b>A. Esmaili Torshabi</b> , P. Samadi Miyandoab, <i>Technology in Cancer Research and Treatment (In Press)</i> DOI: 10.1177/1533034615595737

		S. Nankali, <b>A. Esmaili Torshabi</b> , P. Samadi Miandoab, A. Baghizadeh., <i>Frontier in Biomedical Technologies</i> , vol. 2(2), pp. 381-387, 2015
		S. Nankali, <b>A. Esmaili Torshabi</b> , Payam Samadi Miandoab, Amin Baghizadeh., <i>Journal of Applied Clinical Medical Physics</i> , vol. 16 (1), pp. 221-233, 2016
P. Samadi Miyandoab	A Quantitative Investigation of Patient Setup Error in Radiotherapy of Dynamic Tumors Using Non-Linear Methods	P. Samadi Miandoab, <b>A. Esmaili Torshabi</b> , S. Nankali., <i>Frontiers in Biomedical Technologies</i> , Vol. 2, pp. 404-413, 2015
		P. Samadi Miandoab, <b>A. Esmaili Torshabi</b> , S. Nankali, M. Rezai, <i>Frontiers in Biomedical Technologies</i> , Vol. 2(1), pp. 347-357, 2015
		P. Samadi Miandoab, <b>A. Esmaili Torshabi</b> , S. Nankali, M. Rezaei Raeini. (Accepted in <i>Iranian Journal of Medical Physics</i> , In Press)
		P. Samadi Miandoab, <b>A. Esmaili Torshabi</b> , S. Nankali. (Accepted in <i>Journal of Biomedical Physics and Engineering</i> , In Press).
		P. Samadi Miandoab, <b>A. Esmaili Torshabi</b> , S. Nankali. (Accepted in <i>Journal of Applied Clinical Medical Physics</i> , In Press).
A.Ebrahimi	A Monte Carlo Study on the Effect of Respiratory Motion on Prescribed Dose Distribution at Proton Therapy	A.Ebrahimi, <b>A. Esmaili Torshabi</b> , V. Saba, <i>International Journal of Radiation Research</i> , (Under revision)
S. Parandeh	Application of Deformable Image Registration in Image Guided Radiotherapy	S. Parandeh, <b>A. Esmaili Torshabi</b> , (Accepted in <i>Journal of Biomedical Physics and Engineering</i> , In Press)

- Note: My students Ms. L. Ghorbanzadeh & Mr. S. Nankali have been accepted as PhD student at USA (Oregon State Univ.) and Denmark (Aarhus Univ. Hospital), respectively. (docs. can be sent, if needed)

### Academic Collaboration Agreements:

2016(Mar.)-Now: Oliver Blanck PhD, Chief Operating Officer, Head of Medical Physics,

Head of Research and Development, Saphir Radiosurgery Center  
Northern Germany & Frankfurt am Main, Germany (Working on  
Image Guided Radiotherapy)

2012-Present Mohamad Nokhostin PhD, Department of Physics, Surrey University,  
UK (working on Compound Semi-conductor Detectors)

### **Languages:**

- Native Language: Persian
- Second language: English (Excellent)
- Third Language: Japanese (Intermediate)
- Fourth Language: Italian (Intermediate)

### **Memberships**

#### ***As Colleague member (Part Time Assistant Professor):***

- Radiotherapy and Oncology Center, Shafa Hospital in Kerman University of Medical Sciences,

#### ***As Referee member:***

- Editorial Board member at Advances in Oncology Research and Treatments journal (<http://www.omicsonline.org/editorialboard-advances-oncology-research-and-treatments.php>)
- Official Referee at Iranian Journal of Medical Physics (IJMP)
- Referee at Multi-disciplinary Cancer Investigation (MCI)
- Referee at Journal of Biomedical Research (JBR)
- Referee at Technology in Cancer Research and Treatment Journal (TCRT)
- Referee at International Journal of Radiology and Imaging Technology (IJRIT)
- Referee at International Journal of Radiation Oncology Biology Physics (IJROBP)
- Formal referee of The 6th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2017)

**Hobbies:**

Reading historical books, watching historical movies and playing volleyball