Seyed Hossien Rasta

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Status: Married, (Wife: Psychiatrist, Researcher) Languages: Persian, English, Azari

RESEARCH

My principal research interests lie in the field of biomedical optical spectroscopy, diffuse imaging & optics, and optics applications in medical diagnosis. I have been investigating the perfusion imaging spectroscopy of the retina eye using a scanning laser ophthalmoscope. I have developed the method of spectral perfusion imaging of the retina that utilises SLO together with two red and infrared lasers in order to present the relative oxygen levels of the retina. Using image processing for detection of capillary non-perfusion in fluorescein angiogram of eye is another field that I have recently been developing.

My future research plans are built on the foundations to further develop in the imaging system, measurements, and the clinical application that would serve as a way to follow disease progression and evaluate treatments in diabetic retinopathy patients.

EDUCATION

2002-2007	**PhD in Medical Physics, 'Lasers Application in Medical Diagnosis'** Dept of Bio-Medical Physics , University of Aberdeen, UK Supervisor: Prof Peter F Sharp, Scholarship awarded by the MHME
2002-2002	**MSc course in Medical Physics, Non-Ionising Radiation** (Taught Courses), Dept of Bio-Medical Physics , University of Aberdeen, UK
1990-1992	**MSc in Biophysics,** Inst. of Biochemistry & Biophysics (IBB), University of Tehran, Iran. (Theory/ Practical Courses and Dissertation), scored with the Highest Honours
1985-1989	**BSc in Applied Physics**, Final project: scored with the highest honours. Dept of Physics, University of Mashhad, Iran
1984	**Diploma in Math and Physics,** Grade A

ACADEMIC APPOINTMENTs

2012- now	**Education & Research coordinator** in Medical Bioengineering Dept., School of Advanced Medical Sciences, Tabriz University of Medical Sciences. Iran
2008- now	**Assistant Professor & Education coordinator** in Medical Physics Dept., Faculty of Medicine, Tabriz University of Medical Sciences. Iran
2008- now	**Honorary Postdoc Researcher** in School of Medical Sciences, University of Aberdeen, UK
1996-2002	**Lecturer** in Medical Physics, Tabriz University of Medical Sciences. Iran

ACADEMIC EXPERIENCEs

2008-	**Lecturing** the following subjects for students:

Optics & Vision for MSc of Medical physics, and MD of Medicine
Laser Applications in Medicine for MSc of Medical physics, and MD of Medicine, Dentistry and Pharmacy;
Biophysics (Special subjects) for MSc & BSc of Medical sciences and Pharmacy;.
Image Processing in Medicine using MATLAB for MSc Medical Physics, BSc Radiology
Physics (Special subjects) for BSc of Physiotherapy, Environment Health, Radiation Health
Computer application in Medical Imaging for BSc Radiology
Supervision of thesis for MSc Medical Physics and Medical students in Medical Physics Laboratory

1996-2002 **Medical Physics** (Theory & practical, the subjects: Non-Ionizing Radiation, Optics and High Frequency Currents); **General Physics**; **Biophysics**; and **Computer applications** in Biomedical Sciences; for Medical students and postgraduates; Tabriz University of Medical Sciences. Iran.
Supervision of Medical students in Practical Medical Physics Laboratory.
Co-supervision of three thesis of Medical Students in the field of "*External Radiotherapy in Treatment of Carcinoma of the Lung Chest".*

1991-1995 **Tutor/ Teaching**:
Biophysics, and Practical Radiobiology for undergraduate; Computer applications, Bio-informatics for the Postgraduate students within a course and workshop, IBB, Tehran University.

CLINICAL EXPERINCE

2009- now **Clinical attachment**, Retinal Imaging, Fundus Camera & OCT, Nikokary Eye Clinic for Retina, Ophthalmology Dept., Faculty of Medicine, TUMS, Tabriz, Iran
1999-2001 **Clinical attachment,** Gama Therapy, Radiotherapy Dept, Faculty of Medicine, TUMS, Tabriz, Iran

WORK EXPERIENCE

2012-now **Education & Research Coordinator** of Medical Bioengineering Dept., School of Advanced Medical Sciences, TUMS, Tabriz, Iran
2010- now **Advisor** of Medical Students in basic sciences, Faculty of Medicine
2009- now **Administrator** of Optics and Laser Lab., Faculty of Medicine
2008- now **Education Coordinator** of Medical Physics Dept. Faculty of Medicine, TUMS, Tabriz, Iran
1995-1996 **Administrator** of Informatics Council Office in RcSTIM, Tehran, Iran
1996-1999 **Technical adviser of** a computer company, Selling & Installing networks
1991-2001 **Adviser** of Help Desk, and computer workshops, IBB; & TUMS; Iran

PROFESSIONAL MEMBERSHIP

Optical Society of America (OSA), member 2006-
Medical Physics Association of Iran (IMPA / IOMP), corporate member 1998-
Physics Society of Iran, corporate member 1992-
Institute of Physics and Engineering in Medicine, UK, associate member 2004

RECENT CERTIFICATE

'Medical Sciences Education Principles' Tabriz, Iran, 2012
'Registry of Clinical Trials' , Tabriz., Iran, 2010
'Radiation Protection in Medicine', Tabriz, Iran 2009
'Leadership, Team working, Creativity … ', Aberdeen, UK 2007

'Public Service Interpreting', Aberdeen, UK, 2005
'Laser Safety in Medical Use', Aberdeen, UK, 2002
'**Novel optical development for monitoring in tissue engineering'**, IPEM, UK, 2002

TECHNICAL SKILLS

SPSS for statistics, MATLAB for image processing, Computer programming in Foxpro for research. An excellent mix of academic theory and research works with strong base of physics and math.

SOCIAL ACTIVITY

Juvenile Diabetes Research Foundation, Student mountaineering group of IBB, Travelling/ Tourism, Photography, Tennis; Mountain hiking, Have received Certificate from Iranian Mountaineering Federation for successfully climbing the Highest Peak in Iran (Damavand: 5671 meter).

RECENT PUBLICATIONs

Ahmad Keshtkar, Hadi Seyedarabi, Peyman Sheikhzadeh, **Seyed Hossein Rasta** 'Discriminant Analysis Between Myocardial Infarction Patients and Healthy Subjects Using Wavelet Transformed Signal Averaged Electrocardiogram and Probabilistic Neural Network'**.** Journal of Medical Signal and Sensors, JMSS, 3(4):225-231, 2013

Rasta S H, Nikfarjam S, Javadzadeh A, Seyed Arabi H. 'Automated Detection of Capillary Non-perfusion in Retinal Fluorescein Angiography', in Diabetic Retinopathy Eyes, is submitted for IEEE Transactions On Medical Imaging, ITMI, 2013

Rasta S H, Manivannan A, Sharp P, 'Spectral imaging technique for retinal perfusion detection using confocal scanning laser ophthalmoscopy', Journal of Biomedical Optics 17(11), 116005,1-11, 2012, DOI: 10.1117/1.JBO.17.11.116005 http://spie.org/x648.html?product_id=1001590

Rasta, Seyed H Manivannan, A Sharp, Peter F 'The Feasibility of Oxygen Perfusion Imaging of Human Retina Using a New Non-invasive Near Infrared Imaging Technique' Biomedical Engineering ICBME, IEEE Conference Proceedings, 5705020:1-4, Jan 2011 DOI: 10.1109/ICBME.2010.5705020

Keshtkar Ahmad; Mesbahi Asghar; **Rasta S H**; Keshtkar Asghar, 'The feasibility of computational modeling technique to detect the bladder cancer'. Physica Medica; 26(1):34-7, 2010.doi:10.1016/j.ejmp.2009.06.001

Rasta S H: Manivannan A; Sharp P F, 'Spectroscopic imaging of the retinal vessels using a new dual-wavelength'; "Clinical and Biomedical Spectroscopy" , Proc. of SPIE, Vol. 7368, 736805:1-11, 2009, http://dx.doi.org/10.1117/12.831635

Rasta S H, 'Retinal Perfusion Imaging of Human Eye Using Scanning Laser Ophthalmoscope', **Thesis**: 344 pages, has been successfully accepted for Degree of Doctor of Philosophy at University of Aberdeen, UK, 2008,

Rasta S H, 'IPEM Report:17th international Conference on Photonics in Europe – World of Photonics', Inst. of Physics and Engineering in Medicine, *SCOPE*, 15(1), 31-3, 2006. http://www.ipem.ac.uk/docimages/1298.pdf

Rasta S H, Manivannan A, Sharp P F, 'Perfusion imaging of the Retina: Device Adaption', abstract in *Medical Laser Application*, 20(2), 156-7, 2005, doi:10.1016/j.mla.2005.03.003 Oral presentation in World of Photonics Congress, Munich, Germany, 2005, IPEM Bursary awarded.

PRESENTATIONs, KEY NOTEs & ABSTRACs

'Simulation of laser beam path and intensity calculation in the human eye using the optical software of ZEMAX' at IRAVO, Tehran, Iran March 2013, www.irso.org

'A New Fundus Imaging Technique for Quantitative Physiology Measurements using Confocal Scanning Laser Ophthalmoscope' at IRAVO, Tehran, Iran March 2013, www.irso.org

'A Comparative Study of Pre-Processing Techniques in Diabetic Retinopathy Retinal Images: Illumination correction and Contrast Enhancement' at IRAVO, Tehran, Iran March 2013, www.irso.org

'The New Spectral Scanning Laser Technique for Biomedical Imaging in the Human Eye' for Key note presentation at *7th Annual Conference of Association of Medical Laser,* Tehran, Iran Jan 2013, http://www.iran-laser.com/

'Confocal scanning laser ophthalmoscope: does it overcome the fundus camera?' for Key note presentation at 7th Annual Conference of Association of Medical Laser, Tehran, Iran Jan 2013, http://www.iran-laser.com/

'Biomedical optical imaging in the human retina using spectral scanning laser sources' for oral invited presentation at Photonics Europe 2012, Conference on Laser sources and Applications, Brussels, Belgium Apr 2012, http://spie.org/pe

'Simulation of Eye Optical Model using ZEMAX ' lecture at Congress of Research and Innovation in Ophthalmology, Tehran, Iran Feb 2012, http://www.rio2012.ir/

'Spectral Optical Imaging in the Eye Using Scanning Laser System' oral presentation at The 1st MEFOMP international conference of Medical Physics, Shiraz Iran Nov 2011, http://www.jbpe.org/Journal_OJS/JBPE/index.php/jbpe/article/viewArticle/8

'A New Technique to Automated Detection of Capillary non-Perfusion in Fundus Fluorescein Angiogram' poster presentation at The 1st MEFOMP international conference of Medical Physics, Shiraz Iran Nov 2011, http://www.jbpe.org/

'Eye Modeling with ZEMAX and Determining Its Aberration Using a Shack Hartmann Aberrometer' poster presentation at The 1st MEFOMP international conference of Medical Physics, Shiraz Iran Nov 2011, http://www.jbpe.org/

'Feasibility of near-infrared spectral imaging for nano-measurements of retina perfusion using confocal scanning laser ophthalmoscope' accepted for poster presentation in at European Medical Physics and Engineering Conference 2011, Ireland Sep 2011, http://www.empec.ie/.

'Optical Imaging in Medicine at a Glance' Lecture in Congress on 'Photonics in Medical Sciences and Biology' Tabriz, Iran, May 2011, http://tbiophotonics.tabrizu.ac.ir/

'Biomedical optics imaging technologies in detection and early diagnosis of diseases for Human health care. accepted for oral presentation in 'The Role of Hi-Tech in Human Prosperity – Opportunities and Challenges' Kish, Iran April 2011 , www.irctp.com,

'The Feasibility of Oxygen Perfusion Imaging of Human Retina Using a New Non-invasive Near Infrared Imaging Technique' Oral presentation in 'The 17th Iranian Conference on Biomedical Engineering, IEEE' Nov 2010, http://icbme.misp.ir/ indexed in IEEE Xplore

'Investigation of near-infrared spectroscopy for the oxygen perfusion nano-measurements of human retina using confocal scanning laser ophthalmoscope' Oral presentation in 'The 9th Iranian Medical Physics Congress 9IMPC', abstract in , www.9impc.ir, Iran, May 2010,

'Spectral confocal scanning laser ophthalmoscope for the retinal perfusion imaging' abstract 7715-43, accepted for Oral presentation in the conference on "Biophotonics: Photonic Solutions for Better Health Care", http://spie.org/photonics-europe.xml part of the SPIE International Symposium, Photonics Europe, EPE10, Belgium April 2010,

'Spectroscopic imaging of the retinal vessels using a new dual-wavelength' Oral Presentation at the OSA/SPIE European Conferences on Biomedical Optics, Germany. June 2009, http://www.opticsinfobase.org/conferences2009.cfm

'Retinal perfusion imaging in healthy eye and diabetic retinopathy', accepted for poster presentation in "Physics of Medical Imaging" conference, SPIE Medical Imaging, USA, Feb 2009.

'Spectral perfusion imaging of the human retina using a dual-wavelength laser source', accepted for oral presentation in SPIE Optics+Photonics USA Aug 2008.

'Perfusion Imaging Spectroscopy of the Eye: Minimizing the Influence of the SLO components' Oral at: The 12th IRCE, UMIST, Manchester, 2004,

Project report: 'Perfusion Imaging Spectroscopy of the Fundus with the Scanning Laser Ophthalmoscope', Poster at: Annual Postgraduate Symposium, IMS, University of Aberdeen, UK, 2003

'PET/CT: The next great thing or a waste of money?, A review', Presented paper at : The 9th IRCE, UCE, Birmingham, UK, 2002

'Mutual effect of the adjacent residues in improving protein secondary structure prediction', presented poster at: 18th International Congress of Biochemistry and Molecular Biology, *FEBS*, Birmingham, UK, 2000.

'Investigation of Fractal Structures in Bio-macromolecules (Proteins), Poster at: 4th Congress of Medical Physics of Iran, Tehran, Iran, 2000

'Protein secondary structure prediction and modification of probabilistic methods, Poster at: The Forth Symposium on "protein Structure Function Relationship", Karachi, Pakistan, 1995

'Generating a software for protein secondary structure prediction as a means of structural analysis, poster at: The Second Biochemistry Congress of Iran, Tehran, Iran, 1993

THESIS, BOOK AND CHAPTER

Rasta S H, '**Retinal Perfusion Imaging of Human Eye Using Scanning Laser Ophthalmoscope'**, Thesis: 344 pages, has been successfully accepted for Degree of Doctor of Philosophy at University of Aberdeen, UK, 2008,

Rasta S H et al, Co-Author of "**Handbook of Medical Physics Laboratory'**" published for Students of Medicine and Medical Sciences, Tabriz UMS, 2001

Rasta S H and Madaen K, Co-Translator of the book: "**Lasers in Urological Surgery**" by Hoffestetter G. (1997), TUMS, ISBN 964-92504-0-9,Tabriz, Iran 1999

Rasta S H, '**Prediction of Protein Secondary Structure and Modification of Probabilistic Methods**' Thesis:183 pages, has been successfully accepted for Degree of Master of Science at University of Tehran, Iran, 1994,

WORKSHOP/COURSEs COMPLETED

2006-2010 One week course on Network Science, April 2010, IP & Commercialisation for Science Researcher; Communicating Science to the Public; CLSM PG Workshop: Research funding & grant writing, communicating science, Publication strategies; Negotiating Skills; Leadership, Team working, Creativity and Presenting your Case; Create a Web page (I-III). Statistics for Bio-science (I-III); Bio-Medical Physics MSc Project Talks; Strategies for Academic Research Success; Mind Mapping: Use More of Your Brain

2005-2006 Radiation Protection I,II; Writing and defending your Thesis; An Introduction to Ethics; Presenting Yourself; ASPIRE PG Workshop1&2, Statistics 1,2,3; Data Analysis & Application development with MATLAB; Writing a Paper; Communication skills; Project managing your research project;

2002-2004 Medical Image Processing Course; Physical Basis of Magnetic Resonance Imaging; Novel optical development for monitoring in tissue engineering; Working with animal tissue; Introduction on Biological Safety Course I,II; Scientific Writing; Master class in Writing a Research Proposal; A study on 'Laser Safety in Medical Use'; Academic Writing for Science; The fire extinguisher training course; Proper Scientific Conduct; Managing your references;

REFERENCE

1- Sharp P.F. Professor, Head of Bio-Medical Physics Dept., University of Aberdeen, Aberdeen AB25 2ZD, UK, p.sharp@abdn.ac.uk ,Tel: 01224 552499 Fax: 01224 685648

2- Welch, A. Professor, The John Mallard PET Centre, School of Medical Sciences, University of Aberdeen, Aberdeen AB25 2ZD, a.welch@abdn.ac.uk, Tel: +44 (0)1224 553829,

3- Keshtkar, A, Associate professor, Head of Medical physics dept., Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz 51666-14766, Iran, akeshtkar@tbzmed.ac.ir, Tel:+98 411 3364660