Srijeeta Bagchi

Contact Information

Physics Research Laboratory
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Education

Indian Institute of Science, Bangalore, India

Ph.D. Student, Instrumentation and Applied Physics, May 2013 — *GPA*: 6.4/8.0

- Dissertation topic: Studies on Quantitative Photoacoustic Tomography: Model-Based Reconstruction using Deterministic and Stochastic Algorithms
- Advisors: Prof. Ram Mohan Vasu, Prof. Debasish Roy

Jadavpur University, Kolkata, India

M.E., Biomedical Engineering, July 2006 — *CGPA*: 9.15/10.00

- Dissertation topic: Development of Computer-Based Techniques for Study of Postural Sway
- Advisor: Prof. Devaki Nandan Tibarewala

Dr. B. C. Roy Engineering College, Durgapur, India

B.E., Electronics and Communication Engineering, June 2004 — *Percentage*: 83.6

Research Experience

University of California, San Francisco

Associate Specialist, Radiology and Biomedical Imaging — **February, 2013 - present**

- Research project: Designing an energy-independent single photon imaging scanner
- PI: Prof. Youngho Seo

Teaching Experience

Heritage Institute of Technology, Kolkata, India

Lecturer, Electronics and Communication Engineering — **January - March, 2006**

- Course taught: Analog Electronics

Netaji Subhash Engineering College, Kolkata, India

Guest Faculty, Biomedical Engineering — **August - December, 2005**

- Course taught: Biomedical Instrumentation

Honors and Awards

- Student Travel Grant Award from Optical Society of America (OSA) Foundation, 2011
- Student Travel Grant Award from Northeast Bioengineering Conference (NEBEC), 2011
- International Travel Support from Department of Science and Technology, Government of India, 2011
- Best Speaker Award at the Annual Symposium at Department of Instrumentation and Applied Physics, Indian Institute of Science, December 2010
- University Medal from Jadavpur University for securing first position in Master of Biomedical Engineering Examination, December 2006
- Scholarship from Ministry of Human Resources and Development (MHRD), Government of India, August 2006 - July 2012

Research Interests

- Image reconstruction in optical and emission tomography
- Numerical observer studies for image quality assessment

Refereed Journal Papers

F. Weng, **S. Bagchi**, Y, Zan, Q. Huang, and Y. Seo. An energy independent collimator design for a CZT-based SPECT camera. *NIMA: Nuclear Instruments and Methods in Physics Research Section A*, 806, 330-339, January 2016.

S. Bagchi, M. R. Ananthasayanam, R. M. Vasu, and D. Roy. An adaptively tuned extended Kalman filter for accelerated shape-based photoacoustic tomography. *(Submitted)*

S. Bagchi, R. M. Vasu, and D. Roy. Quantitative photoacoustic tomography: direct recovery of absorption coefficient map via an iterated ensemble Kalman filter. *(To be submitted)*

S. Bagchi, T. Raveendran, R. M. Vasu, and D. Roy. A two-stage, Newton-directed pseudo-dynamic ensemble Kalman filter for photoacoustic tomography. *(To be submitted)*

B. Banerjee, **S. Bagchi**, R. M. Vasu, and D. Roy. Quantitative photoacoustic tomography from boundary pressure measurements: noniterative recovery of optical absorption coefficient from the reconstructed absorbed energy map. *JOSA A: Journal of Optical Society of America A*, 25(9): 2347-2356, October 2008. (Selected for publication in the Virtual Journal of Biomedical Optics, 3(11), October 2008, and Virtual Journal of Biological Physics Research, 16(8), October 15, 2008.)

Conference Proceedings Papers

F. Weng, **S. Bagchi**, Q. Huang, and Y. Seo. A Simulation Study Comparing Different Pixel Sizes of CZT Detectors Combined with Pitch-Matched Collimators for SPECT Imaging. *IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS-MIC)*, San Diego, CA, November 2 - 9, 2015.

F. Weng, **S. Bagchi**, Q. Huang, and Y. Seo. Energy Window Optimization in Dual-Isotope SPECT Brain Imaging with Tc-99m/I-123 Via CZT-Based Detectors. *Society of Nuclear Medicine and Molecular Imaging (SNMMI)*, Baltimore, June 6 - 10, 2015.

S. Bagchi and A. Bagchi, "MongoDB as a Datastore for Iterative Analysis in Diagnostic Medical Imaging, *MongoDB World 2015*, New York, June 1 - 2, 2015.

F. Weng, **S. Bagchi**, Q. Huang, and Y. Seo. Design Studies of a CZT-based Detector Combined with a Pixel-Geometry-Matching Collimator for SPECT Imaging. *IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS-MIC)*, Seoul, Korea, October 27 - November 2, 2013.

S. Bagchi, D. Roy, and R. M. Vasu. Forward problem solution in photoacoustic tomography by discontinuous Galerkin method. *Optical Molecular Probes, Imaging and Drug Delivery*, OSA Technical Digest (CD) (Optical Society of America, 2011), paper JTuA22, Monterey, California, April 4-6, 2011.

S. Bagchi, B. Banerjee, R. M. Vasu, and D. Roy. Noniterative inversion strategy for photoacoustic tomography: Recovery of absorbed energy map from boundary pressure measurements. *2011 IEEE 37th Annual Northeast Bioengineering Conference (NEBEC)*, pp. 1-2, Troy, New York, April 1-3, 2011.

B. Banerjee, **S. Bagchi**, R. M. Vasu and D. Roy. Quantitative photo-acoustic tomography from boundary pressure measurements: non-iterative recovery of optical absorption coefficients from reconstructed absorbed energy map. *Proc. XXXIII Optical Society of India (OSI) Symposium on Optics and Optoelectronics*, Tezpur University, Assam, India, 2007 (invited presentation).

S. Bagchi, A. Ghosh, P. Lenka, D. N. Tibarewala. Analysis and characterization of stabilograms using static posturography. *National Conference on Biomechanics 2006*, Bengal Engineering and Science University, India, December 2006.

Professional Experience

BDH Middle East LLC, Dubai, UAE

Summer intern **June - July, 2003**

Hands-on experience in Analytical Instrumentation.

Technical Experience

- *Languages*: MATLAB, C/C++, Python, FORTRAN, CUDA GPU
- *Packages*: GEANT4, ANSYS, LaTeX, C, C++ and FORTRAN linear algebra libraries, Microsoft Office
- *Algorithms*: Monte Carlo modeling for particle transport in optical and nuclear imaging systems, Galerkin finite element methods for discretizing partial differential equations, Newton and quasi-Newton methods for optimization, Stochastic filtering for parameter estimation
- *Platforms*: MacOS, Linux, Windows
- *Databases*: MySQL, MongoDB
- *Experimental skills*: Designing preclinical SPECT, photoacoustic tomography and elastography experiments, preparing tissue-mimicking phantoms using polyvinyl alcohol.

Scientific Review Activity

- Journal of Medical Imaging and Radiation Sciences (Reviewer)
- Physics in Medicine and Biology (Reviewer)
- Reports in Medical Imaging (Consulting editor)

Memberships

OSA, Student Member, 2011
IEEE, Student Member, 2013
IEEE, Student Member, 2014