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Education

- 1993 - 1998 Applied Mathematics, Ph.D.
Korea Advanced Institute of Science and Technology (KAIST)
Dissertation Title : Study on iterative methods in inverse scattering problem
Advisor : Prof. U Jin Choi
- 1991 - 1993 Applied Mathematics, M.S., KAIST
- 1987 - 1991 Mathematics (major), Computer Science (minor), B.S., KAIST

Professional Experiences

- 2006 - Present Technical Staff Member, Los Alamos National Laboratory, USA
Applied Modern Physics Group
Research Experience: Investigating brain connectivity and dynamics. Developing integration technique of biomedical multi-modal imaging data and techniques dealing with biomedical noise issue.
- 2004 - 2006 Technical Staff Member, Los Alamos National Laboratory, USA
Biological & Quantum Physics Group
Research Experience: Developed integration technique of biomedical multi-modal imaging data through probabilistic method and techniques dealing with biomedical noise issue. Involved large computation technique development using stochastic closure.
- 2002 - 2004 Post-doc Research Associate, Los Alamos National Laboratory, USA
Biological & Quantum Physics Group (Dr. Schmidt and Dr. Wood)
Research Experience: Developed initially spatiotemporal source analysis for Magnetoencephalographic/Electroencephalographic (MEG/EEG) neuromagnetic data through Bayesian inference. Modelled advanced noise covariance structure for MEG/EEG brain signal.
- 2000 - 2002 Post-doc Research Fellow, University of New Mexico, USA
Brain and Computation Lab., Dept. of Computer Science (Prof. Pearlmutter)
Research Experience: Developed various fast robust subject-independent MEG/EEG dipole source localizers using artificial neural network.
- 1999 - 2000 Post-doc Scientist, Korea Research Institute of Standards and Science, South Korea
Superconductivity Group (Dr. Yong-ho Lee)
Research Experience: Developed various MEG/EEG source localizers.
Coordinated MEG/EEG signal analysis tool development.

Continued Professional Experiences

- 1998 - 1999 Post-doc Research Associate, KAIST, South Korea
Center for Plasmas and Fusion Studies (Prof. Choongseock Chang)
Research Experience: Involved modelling new mathematical equation explaining empirical ion propagation and interaction behavior in Tokamak reactor, its numerical simulation, and code development of wave propagation & interaction in tokamak.
- 1997 - 1998 Short-term Visiting Scholar, New York University, USA
Courant Institute of Mathematical Sciences
Research Experience : Studied fundamental tokamak physics and existing plasma ion propagation codes.
- 1997 - 1998 Research Assistant, KAIST, South Korea
Department of Physics and Department of Mathematics
Research Experience : Studied various fundamental mathematical approaches and developed numerical algorithm solving inverse scattering problem. Developed ion transport code in high temperature plasma physics.
- 1991 - 1997 Teaching Assistant, KAIST, South Korea
Department of Mathematics

Research Interests

- Biomedical Imaging
 - Bio-signal processing and analysis
 - * noise reduction techniques.
 - * source localization analysis for neural data (MEG/EEG) and cardiac data (MCG/ECG).
 - * integration on brain multi-modal imagings such as MEG/EEG and fMRI.
 - Probabilistic modelling
 - * Bayesian inference analysis.
 - Brain-computer interfaces
 - * Fast localization techniques for BCI.
 - * Extraction of characteristic from large datasets using artificial neural network.
- Scientific Computing and Simulation Study
 - Scale-up problem of stochastic closure in physical problems.
 - Optimization methods, Iterative methods, FEM/BEM.
 - Markov Chain Monte Carlo (MCMC) technique for fast reliable sampling.
- Theoretical Inverse Problems
 - Inverse scattering and obstacle problems.
 - Inverse source and medium problems.

Teaching Experiences

2004 - 2005 Sunday School Teacher for Youth, Santa Fe Korean Church, Los Alamos
2002 - Present Mentoring a graduate student (with Dr. Schmidt)
1991 - 1997 Teaching Assistant, KAIST, South Korea
Department of Mathematics
Courses taught : Finite Element Method, Advanced Numerical Analysis, College Calculus
Vector Analysis, Applied Mathematics for Engineers.

Publications and Presentations

- Journal Papers and Refereed Conference Papers
 1. S. M. Plis, D. M. Schmidt, S. C. Jun, D. M. Ranken, A generalized spatiotemporal covariance model for stationary background in analysis of MEG data, IEEE 2006 International Conference of the Engineering in Medicine and Biology Society. [Online] <http://arxiv.org/abs/physics/0605142>
 2. S. C. Jun, S. M. Plis, D. M. Ranken and D. M. Schmidt, Spatiotemporal noise covariance estimation from limited empirical MEG data, Physics in Medicine and Biology, Vol. 51 (2006) 5549–5564.
 3. S. C. Jun, J. S. George, S. M. Plis, D. M. Ranken, D. M. Schmidt, and C. C. Wood, Improving source detection and separation in spatiotemporal Bayesian inference dipole analysis, Physics in Medicine and Biology, Vol. 51 (2006) 2395–2414.
 4. S. M. Plis, J. S. George, S. C. Jun, J. Pare-Blagoev, D. M. Ranken, D. M. Schmidt, and C. C. Wood, Modeling spatiotemporal covariance for MEG/EEG source analysis, 2006, To appear in Physical Review E. [Online] <http://arxiv.org/abs/physics/0503063>
 5. S. C. Jun, J. S. George, J. Pare-Blagoev, S. M. Plis, D. M. Ranken, D. M. Schmidt, and C. C. Wood, Spatiotemporal Bayesian Inference Dipole analysis for MEG Neuroimaging Data, NeuroImage, Vol. 28 (2005) 84-98.
 6. S. C. Jun, and B. A. Pearlmutter, Fast robust subject independent MEG source localization using an artificial neural network, Human Brain Mapping, Vol. 24 (2005) 21-34.
 7. S. C. Jun and B. A. Pearlmutter, Subject-independent MEG source localization by a multilayer perceptron, Advances in Neural Information Processing Systems 16, (2004) 741-748.
 8. S. C. Jun, B. A. Pearlmutter and G. Nolte, MEG source localization using an MLP with a distributed output representation, IEEE Transactions on Biomedical Engineering, Vol. 50 (2003) 786-789.
 9. S. C. Jun, B. A. Pearlmutter and G. Nolte, Fast accurate MEG source localization using a multilayer perceptron trained with realistic noise, Physics in Medicine and Biology, Vol. 47 (2002) 2547-2560.
 10. J. Lee, Y. Lee, S. C. Jun and H. Kwon, Localization error of a 150-channel whole-cortex magnetoencephalography system, Journal of the Korean Physical Society, Vol. 38 (2001) 772-776.
 11. S. C. Jun, A note on fractional difference based on a linear combination between forward and backward differences, Computers & Mathematics with Applications, Vol. 41 (2001) 373-378.
 12. S. C. Jun, K. Imre, D. Stevens, H. Weitzner and C. Chang, Poloidal field effects on fundamental minority ion cyclotron resonance heating in a tokamak plasma, Physics of Plasmas, Vol. 7 (2000) 1467-1478.
 13. S. C. Jun and U. J. Choi, A note on an extended Born method in inverse scattering problems,

Applied Mathematics Letters, Vol. 12 No. 3 (1999) 71-76.

14. S. C. Jun and U. J. Choi, Convergence analyses of the Born iterative method and the distorted Born iterative method, Numerical Functional Analysis and Optimization, Vol. 20 (1999) 301-316.
 15. Y. Park, S. C. Jun and U. J. Choi, A global eighth order spline procedure for a class of boundary value problems, Communications on Korean Mathematical Society, Vol. 9 (1994) 985-994.
- Conference Papers and Published Abstracts
 1. S. C. Jun, J. S. George, J. Pare-Blagoev, S. M. Plis, D. M. Ranken, D. M. Schmidt, and C. C. Wood, Dipole Analysis on Spatiotemporal MEG signals using Bayesian Inference, Brain Topography, Vol. 16 (2004) 186.
 2. S. M. Plis, J. S. George, S. C. Jun, J. Pare-Blagoev, D. M. Ranken, D. M. Schmidt, and C. C. Wood, Realistic spatiotemporal noise covariance model for MEG/EEG source analysis, Brain Topography, Vol. 16 (2004) 187.
 3. D. M. Schmidt, J. S. George, S. C. Jun, J. Pare-Blagoev, D. M. Ranken, and C. C. Wood, Extended Region Spatial-temporal MEG Analysis using Bayesian Inference, Brain Topography, Vol. 16 (2004) 186.
 4. J. Pare-Blagoev, J. George, S. C. Jun, S. M. Plis, D. M. Ranken, D. M. Schmidt, D. Sheltraw, and C. C. Wood, Experimental Design issues in combined Hemodynamic and Electrophysiological Imaging, Brain Topography, Vol. 16 (2004) 189-190.
 5. S. C. Jun, B. A. Pearlmuter and G. Nolte, Fast subject independent MEG source localization using an artificial neural network, Society for Neuroscience Abstracts 32, 2002
 6. S. C. Jun, B. A. Pearlmuter and G. Nolte, Fast robust MEG source localization using MLPs, Biomag 2002 Proc. 13th Int. Conf. on Biomagnetism (2002) 765-767.
 7. H. Kwon, Y. Lee, S. C. Jun, J. Kim, J. Park and S. Kuriki, Localization errors with 40-channel tangential fields, Biomag 2000 Proc. 12th Int. Conf. on Biomagnetism (2001) 943-946.
 - Manuscripts in preparation
 1. Extensive Study for MEG/EEG Spatiotemporal Bayesian Inference Dipole analysis.
 2. Integrated MEG and EEG source analyzer
 3. What information do we get from background brain activity?
 4. Least Square noise covariance estimation
 - Conference Presentations (Poster and Oral)
 1. World Congress on Medical Physics and Biomedical Engineering 2006 at Seoul, South Korea on August 27 – September 1, 2006
 2. Biomag 2006 at Vancouver, Canada on August 20 – 26, 2006
 3. Human Brain Mapping at Toronto, Canada on June 2005.
 4. Biomag 2004 at Boston, USA on August 8–12, 2004.
 5. NIPS 2003 at Vancouver, Canada on December 8 –13, 2003.
 6. ISBET 2003 at Santa Fe, New Mexico, USA on November 20–23, 2003.
 7. Society for Neuroscience 32nd Annual Meeting at Orlando, Florida, USA on November 2–7, 2002.
 8. Biomag 2002 at Jena, Germany on August 10–14, 2002.
 9. Inverse Problems in Engineering Symposium at Texas A &M University, College Station, Texas, USA on June 14–16, 2001.
 - Invited Talks
 1. SAMSI Workshop on High Dimensional Inference and Random Matrices, Oct. 30 – Nov. 3, 2006,

Research Triangle Park, North Carolina, USA.

2. MEG Center at Seoul National University Hospital on August, 2006, Seoul, South Korea.
3. Organizing symposium session ‘EEG/MEG Source Imaging’ at World Congress 2006 on Medical Physics and Biomedical Engineering, Aug. 27 – Sep. 1, 2006, Seoul, South Korea.
4. The Mind Institute, October, 2004, Albuquerque, New Mexico, USA.
5. Seoul National University on ‘Inverse Problem in Biomagnetism - MEG Source Analysis’, December, 2003, Seoul, South Korea.
6. Korea Electrotechnology Research Institute on ‘Application of Artificial Neural Networks to MEG Source Localization Problem’, December, 2003, Euwang, South Korea.
7. Korea Research Institute of Standards and Science on ‘Probabilistic Approach on Spatiotemporal Analysis -Bayesian Inference’, December, 2003, Taejeon, South Korea.
8. Korea Advanced Institute of Science and Technology on ‘Inverse Problem in Biomedical Imaging’, December, 2003, Taejeon, South Korea.

Awards and Honors

- Travel Award for MSRI Workshop (UC-Berkeley, USA on May 3 –5, 2006).
- Travel Awards for SAMSI Workshop (Research Triangle Park, NC, USA on Sep. 11–14, 2005 and Sep. 17–20, 2006 (declined)).
- NSF sponsored Travel Grant Competition Winner for 5th International Conference on Inverse Problems in Engineering (5ICIPE) Jul. 10 - 15, 2005, Cambridge, United Kingdom.
- Travel Awards for IMA Workshop (U. of Minnesota at Minneapolis, USA on Mar. 28 - 30, 2005 and Jan. 9 – 12, 2006 (declined)).
- Young Investigator Award Winner at Biomag 2004 (Boston, USA on Aug. 9 - 12, 2004).
- Travel Award for ICAM Workshop on Frontiers in Biological Physics III: Neurobiology (Aspen, Colorado, USA on June 18 - 20, 2004).
- Travel Awards for IPAM workshops (UC-LA, USA on Sep. 9 - 12, 2003, Nov. 12 - 19, 2003, Nov. 7 – 11, 2005, and Feb. 6 – 10, 2006)
- Junior Scientist Fellowship Winner from 14th Conference of the International Society for Brain Electromagnetic Topography (ISBET 2003), Nov. 20 - 23, 2003, Santa Fe, New Mexico, USA.
- NSF sponsored Travel Grant Competition Winner for Applied Inverse Problems Conference (AIP), May 18 - 23, 2003, Lake Arrowhead, California, USA.

Memberships and Professional Activities

- Memberships
 - IEEE member : Engineering in Medicine and Biology; Signal Processing
- Reviewer Activities (over 30 times)
 - IEEE Transactions on Biomedical Engineering (since 2003)
 - IEEE Transactions on Signal Processing (since 2004)
 - Artificial Intelligence in Medicine (since 2005)

- Measurement Science and Technology (since 2005)
- Inverse Problem (since 2006)

Skills

- Languages : Korean, English
- Computing skills : C, F77, Unix, Mathematica, Matlab, Labview, Linux, IDL

References

(Detailed information would be available on request)