

Work Groups

- 2013 **Research Visit to UCLA**, *Department of Mathematics*, invited by Prof. Dr. Andrea Bertozzi and Prof. Dr. Stanley Osher.
- since 2010 **Member of "Workgroup Imaging"**, *Institute of Computational and Applied Mathematics, University of Münster*, headed by Prof. Dr. Martin Burger.
- since 2008 **Member of "Methods in bioelectromagnetism"**, *Institute for Biomagnetism and Biosignalanalysis, University of Münster*, headed by PD Dr. Carsten Hermann Wolters.

Theoretical Interests

Inverse problems, Bayesian inference, mathematical modeling, nonlinear dynamics, stochastic processes, statistical physics

Methodical Interests

MCMC, multimodal integration, finite element methods

Applications of Interest

Biomedical imaging and computing, brain research

Diploma Thesis

- Title *Hierarchical Bayesian Approaches to the Inverse Problem of EEG/MEG Current Density Reconstruction*
- Submission Mar. 2011
- Supervisors Prof. Dr. Martin Burger and PD Dr. Carsten Hermann Wolters

Publications

- [1] A.M. Janssen, S.M. Rampersad, F. Lucka, B. Lanfer, S. Lew, Ü. Aydin, C.H. Wolters, D.F. Stegeman, and T.F. Oostendorp. The influence of sulcus width on simulated electric fields induced by transcranial magnetic stimulation. *Physics in Medicine and Biology*, 58(14):4881, 2013.
- [2] F Lucka. Fast markov chain monte carlo sampling for sparse bayesian inference in high-dimensional inverse problems using l1-type priors. *Inverse Problems*, 28(12):125012, 2012.
- [3] F. Lucka, S. Pursiainen, M. Burger, and C.H. Wolters. Hierarchical Bayesian inference for the EEG inverse problem using realistic FE head models: Depth localization and source separation for focal primary currents. *NeuroImage*, 61(4):1364–1382, 2012.

- [4] S. Pursiainen, F. Lucka, and C.H. Wolters. Complete electrode model in EEG: relationship and differences to the point electrode model. *Physics in Medicine & Biology*, 57(4):999–1017, 2012.
- [5] F. Lucka, S. Pursiainen, M. Burger, and C.H. Wolters. Hierarchical Bayesian Models for EEG Inversion: Depth Localization and Source Separation for Focal Sources in Realistic FE Head Models. In *Biomedical Engineering*, volume 56. De Gruyter, 2011.
- [6] F. Lucka. Hierarchical Bayesian Approaches to the Inverse Problem of EEG/MEG Current Density Reconstruction. Diploma thesis, University of Münster., March 2011.