

Bayesian Scientific Computing References after the Yellow Book

Daniela Calvetti, Erkki Somersalo

Case Western Reserve University
Department of Mathematics, Applied Mathematics and Statistics

Lyngby, December 2019

Bayesian overview

- Calvetti D and Somersalo E (2010) Subjective Knowledge or Objective Belief? In: L. Biegler, G. Biros, O. Ghattas, M. Heinkenschloss, D. Keyes, B. Mallick, Y. Marzouk, L. Tenorio, B. van Bloemen Waanders, K. Willcox (eds) *Large-scale inverse problems and quantification of uncertainty*. John Wiley & Sons, Ltd, UK, 33D70.
- Calvetti D and Somersalo E (2011) Statistical methods in imaging. In: O. Scherzer (Ed.): *Handbook of Mathematical Methods in Imaging* Springer Verlag, 913–957.
- Calvetti D, Kaipio J and Somersalo E (2014) Inverse problems in the Bayesian framework. *Inverse Problems* 30(11), 110301.
- Calvetti D and Somersalo E (2018) Inverse problems: from regularization to Bayesian inference. *WIREs Computational Statistics* **e1427** (19pp.)

Hierarchical models

- Calvetti D and Somersalo E (2007) Gaussian hypermodels and recovery of blocky objects. *Inverse Problems* **23** 733–754.
- Calvetti D and Somersalo E (2008) Hypermodels in the Bayesian imaging framework. *Inverse Problems* **24** 034013.
- Bardsley JM, Calvetti D and Somersalo E (2010): Hierarchical regularization for edge-preserving reconstruction of PET images. *Inverse Problems* **26**: 035010.
- Calvetti D, Homa L and Somersalo E (2011) Bayesian mixture models for source separation in MEG. *Inverse Problems* **27**:115001.
- Calvetti D, Somersalo E and Strang A (2019) Hierarchical Bayesian models and sparsity: ℓ_2 -magic. *Inverse Problems* **35**: 035003 (26pp)
- Calvetti D, Pragiola M, Somersalo E and Strang A (2019) Sparse reconstructions from few noisy data: analysis of hierarchical Bayesian models with generalized gamma hyperpriors. *Inverse Problems* (to appear).

Hierarchical models and preconditioners

- Calvetti D, McGivney D and Somersalo E (2012) Left and right preconditioning for electrical impedance tomography with structural information. *Inverse Problems* **28**: 055015.
- Homa L, Calvetti D, Hoover A and Somersalo E (2013) Bayesian preconditioned CGLS for source separation in MEG time series. *SIAM J Sci Comput* **35**: B778–B798.
- Calvetti D, Pascarella A, Pitolli F, Somersalo E and Vantaggi B (2015) A hierarchical Krylov-Bayes iterative inverse solver for MEG with physiological preconditioning. *Inverse Problems* **31** 125005.
- Calvetti D, Pitolli F, Prezioso J, Somersalo E and Vantaggi B (2017) Priorconditioned CGLS-based quasi-MAP estimate, statistical stopping rule, and ranking of priors. *SIAM J Sci Comput* **39**: S477–S500.
- Calvetti D, Pitolli F, Somersalo E and Vantaggi B (2018) Bayes meets Krylov: Statistically inspired preconditioners for CGLS. *SIAM Review*, **60**: 429–461.

Particle Methods

- Arnold A, Calvetti D and Somersalo E (2013) Linear multistep methods, particle filtering and sequential Monte Carlo. Inverse Problems **29**: 085007.
- Arnold A, Calvetti D and Somersalo E (2014) Parameter estimation for stiff deterministic systems via ensemble Kalman filter. Inverse Problems **30** : 105008.
- Arnold A, Calvetti D, Gjedde A, Iversen P and Somersalo E (2014) Astrocytic tracer dynamics estimated from $[1-^{11}\text{C}]$ -acetate PET measurements. Math Med Biol: a journal of the IMA, 32(4), pp.367-382.
- Calvetti D, Dunlop M, Somersalo E and Stuart A (2018) Iterative updating of model error in Bayesian inversion. Inverse Problems **34**: 025008