BIT50

Axel Ruhe

Published online: 17 March 2011
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The second half century for BIT is started by printing a selection of the contributions to the BIT 50 conference held in Lund on 17–20 June 2010. The conference attracted 136 people from all over the world. There were 10 invited plenary talks, 8 minisymposia with 40 talks and 12 contributed paper sessions with 51 talks.

A *dynamical systems approach for intermittent data assimilation* was the title of the first plenary talk by *Sebastian Reich*, Potsdam Germany. It describes a way to handle a dynamical system, modeled by a system of ordinary differential equations, where the initial values are not exactly known, but there are measurements of the solution at several points of time, think of the situation with numerical weather prediction. A Kalman filter is used to estimate the solution. The next plenary speaker was *Michiel Hochstenbach*, Eindhoven, The Netherlands. His talk has resulted in the paper *Fractional Tikhonov regularization for linear discrete ill-posed problems*. It is shown that, if a fractional power of the outer product is used as a weight matrix, one gets a better quality solution. The third invited talk the first day was given by *Leslie Greengard*, Courant Institute, New York, on *A new integral representation for quasi-periodic scattering problems in two dimensions*, and dealt with wave propagation over fine structured obstacles like gratings, modeled with Maxwell or Helmholtz equations. A boundary element method gives an integral equation formulation that is well understood mathematically and possible to handle numerically.

The second day, a plenary talk by *Margot Gerritsen*, Stanford California, introduced us to the intricacies of finding information in the US Library of Congress, in the topical review *Some computational tools for digital archive and metadata maintenance*. Information science gives rise to many challenging computations, here the

A. Ruhe (✉)

Department of Numerical Analysis and Computer Science (NADA), Royal Institute of Technology (KTH), 10044, Stockholm, Sweden
e-mail: ruhe@kth.se

emphasis is on what precedes the computation. One challenge is to find a graphical structure showing connections between different documents, another is to find metadata like titles useful to catalog documents, knowing only the text of the documents themselves. The next plenary talk by *Desmond Higham*, Strathclyde University Glasgow Scotland, on *Hybrid Simulation of Autoregulation within Transcription and Translation* leads us into another interesting modeling task, to treat gene regulation, described by a discrete event Markov jump process, modeled with the chemical master equation, as a nonlinear stochastic differential equation, SDE. It is handled by a hybrid multiscale approximation that recovers the noise strength of the underlying discrete system.

There were also plenary talks by *Eric Vanden-Eijnden*, Courant NYU, *Jan Hes-thaven*, Brown University Providence RI, *Emmanuel Candès*, Stanford, *Tammy Kolda*, Sandia Livermore and *Daniel Kressner*, ETH Zürich. These are not printed here, but you can certainly find information on them in other places.

There were eight minisymposia with altogether 40 talks, highlighting areas of special interest for BIT. One minisymposium on Inverse problems was organized by *Per Christian Hansen*, the next one on Boundary value problems by *Gustaf Söderlind* and *Ewa Weinmüller*. From this minisymposium, the paper by *Winfried Auzinger* on *An efficient asymptotically correct error estimator for collocation solutions to singular index-1 DAEs*, is printed in this issue. The third minisymposium, organized by *Hans Petter Langtangen* dealt with Numerical software, and the fourth by *Ralf Hiptmair* with Structure preserving PDE computations. There was one minisymposium organized by *Per Lötstedt* and *Tobias Jahnke* on computations from molecular biology, and one on Evolution equations organized by *Eskil Hansen*. The paper by *Ernst Hairer* titled *Linear energy-preserving integrators for Poisson systems* is based on a talk in this minisymposium. On the Saturday we had the two last minisymposia, Information Science, organized by *Lars Eldén* and Industrial applications, organized by *Claus Führer* and *José Diaz*.

There were 51 contributed talks over different topics filling 12 sessions. From a session on Linear algebra, we take the paper by *Walter Gautschi*, titled *Optimally scaled and optimally conditioned Vandermonde and Vandermonde-like matrices*, and from another, on Collocation Volterra and stability, we take *Domingo Hernández-Abreu* with the talk *Global error estimates for an uniparametric family of stiffly accurate Runge-Kutta collocation methods on singularly perturbed problems*. From the contributed paper session on Approximation, we print the paper by *Ben Adcock* titled *Gibbs phenomenon and its removal for a class of orthogonal expansions*, and from the session on PDE and Parallelism, we print the paper *A multigrid preconditioner for an adaptive Black-Scholes solver*, by *Alison Ramage* and *Lina von Sydow*.

Lund was the birthplace of BIT, and it was the enthusiasm of *Gustaf Söderlind*, our editor at Lund University, that made the conference happen. He also found the conference sponsors, the *Faculty of Science* at Lund University, the *Swedish Research Council*, *Kungliga Fysiografiska Sällskapet i Lund*, a local academy for science, medicine and technology founded in 1772, and *Comsol Multiphysics*, a software company started in 1986 by two students at the *Germund Dahlquist* mathematical modeling course. Further, *Carmen Arévalo*, *Claus Führer*, *Eskil Hansen* and *Stefan Diehl* made up a fitting schedule, leading all the 136 participants around to their parts

of the program. Finally *Gunlaug Østbye*, BIT's administrator, brought everybody to the Warhol after Munch exhibition at the Louisiana Art museum, followed by the conference banquet on the shore of Øresund.

I will use this occasion to say thank you to eight members of our Editorial Board who are leaving. Two of you, *Syvert Nørsett* and *Stig Skelboe* are veterans from the group around Carl Eric Fröberg. Good that you have helped us to keep up BIT this long time! Three of our friends of the Nordic countries are now leaving the BIT editorial board, *Uri Ascher*, *Iain Duff* and *Haesun Park*. It has been nice to have had you with us and we hope to take advantage of a continued collaboration in other arenas! Three Scandinavian long timers leaving are *Petter Bjørstad*, *Lars Eldén* and *Gustaf Söderlind*. During your tenure you have made BIT present in your specialities and visible in the Nordic scientific scene.

I am happy to announce seven new members of our editorial board. Welcome *Jan Hesthaven*, *Desmond Higham*, *Michiel Hochstenbach*, *Daniel Kressner*, *Anne Kværnø*, *Rolf Stenberg* and *Mechthild Thalhammer*! We look forward to your help in keeping BIT present in our well cultivated areas in the scientific field and doing orderly expansion into new active areas, where you bring us new expertise.

On behalf of BIT, I wish you a pleasant and beneficial reading!

A handwritten signature in black ink, reading "Axel Ruhe". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Axel Ruhe

A sunny Summer week, the BIT flag flies over Lund. Photo Lynn Brandon

BIT50, entrance. Photo Lynn Brandon

BIT50, 113 participants. Photo Gunlaug Östbye