Schedule – SCAN 2016

As of September 19, 2016.

Sunday, September 25, 2016

18:00 − 20:00 Get-together and registration (Norrlands Nation)

Monday, September 26, 2016

08:00 − 09:00 Registration (Norrlands Nation)

09:00 − 09:30 Opening

09:30 − 10:30 R. E. Moore Prize Awarding Ceremony (Gamla salen; Chair: Baker Kearfott)

> Tibor Csendes, University of Szeged
>
> *On the Wright conjecture on a delay differential equation*

10:30 − 11:00 Coffee break

11:00 − 12:00 Plenary talk (Gamla salen)

> Hiroshi Kokubu, Kyoto University
>
> *Computer-assisted methods for detecting global structure of dynamics*

12:00 − 13:20 Lunch (Norrlands Nation)

13:20 − 14:20 Plenary talk (Gamla salen)

> Mioara Joldes, LAAS-CNRS
>
> *Validated numerics for robust space mission design or Beyond Gravity (2013)*

14:20 − 15:10 Parallel Sessions

Session A1: Fuzzy computations (Inre läs, Chair: Vladik Kreinovich)

> **14:20 − 14:45** Weldon A. Lodwick (University of Colorado Denver), *Interval Methods in the Calculation of Solutions to Fuzzy Interval Linear Systems*
>
> **14:45 − 15:10** K.K. Semenov (Peter the Great St. Petersburg Polytechnic University), *Interval computations in the metrology*

Session A2: ODEs (Gamla salen, Chair: Michael Plum)

14:20 − 14:45 Masahide Kashiwagi (Waseda University), *A study on verified ODE solver from the standpoint of stiffness*

14:45 − 15:10 Akitoshi Takayasu (University of Tsukuba), *Verified numerical computations for blow-up solutions of ODEs*

15:10 − 15:40 Coffee break

15:40 − 17:45 Parallel Sessions

Session B1: Linear algebra (Inre läs, Chair: Denis Gaidashev)

15:40 − 16:05 Roman Iakymchuk (KTH Royal Institute of Technology), *Towards Fast, Accurate and Reproducible LU Factorization*

16:05 − 16:30 Katsuhisa Ozaki (Shibaura Institute of Technology), *Linear Systems with the Exact Solution for Numerical Tests*

16:30 − 16:55 Yuka Yanagisawa (Waseda University), *Verification method for system of linear equations by QR factorization*

16:55 − 17:20 Yuka Kobayashi (Tokyo Woman's Christian University), *An Accurate and Efficient Solution of Ill-conditioned Linear Systems by Preconditioning Methods*

17:20 − 17:45 Xuefeng Liu (Niigata University), *A framework for high-precision verified eigenvalue bounds by using finite element methods*

Session B2: Control (Gamla salen, Chair: Vladik Kreinovich)

15:40 − 16:05 Luc Jaulin (ENSTA Bretagne), *Secure a zone with robots*

16:05 − 16:30 Simon Rohou (ENSTA Bretagne), *Tube Programming Applied to State Estimation*

16:30 − 16:55 Andreas Rauh (University of Rostock), *An Interval-Based Algorithm for Feature Extraction from Speech Signals*

16:55 − 17:20 Andreas Rauh (University of Rostock), *Interval-Based Identification of Friction and Hysteresis Models*

17:20 − 17:45 Andreas Rauh (University of Rostock), *Toward the Optimal Parameterization of Interval-Based Variable-Structure State Estimation Procedures*

Tuesday, September 27, 2016

09:00 – 10:00 Plenary talk (Gamla salen)

Mark A. Stadtherr, University of Notre Dame

Rigorous Method for Robust Optimization and Design of Nonlinear Dynamic Systems

10:00 – 10:30 Coffee break

10:30 – 12:10 Parallel Sessions

Session C1: Optimization (Inre läs, Chair: Vladik Kreinovich)

10:30 – 10:55 Arnold Neumaier (University of Vienna), *Generalized intervals in global optimization*

10:55 – 11:20 Ryo Kobayashi (Waseda University), *A method of verified computation for convex programming*

11:20 – 11:45 Jürgen Garloff (University of Konstanz, HTWG Konstanz), *Fast determination of the tensorial and simplicial Bernstein enclosure*

11:45 – 12:10 Ralph Baker Kearfott (University of Louisiana at Lafayette), *Simplicial Branch and Bound in Interval Global Optimization*

Session C2: Arithmetic (Gamla salen, Chair: Denis Gaidashev)

10:30 – 10:55 Nathalie Revol (ENS de Lyon), *HPC and interval computations*

10:55 – 11:20 Yusuke Morikura (Waseda University), *Fast enclosure for matrix multiplication on a GPU*

11:20 – 11:45 Siegfried M. Rump (Hamburg University of Technology), *The origin of interval arithmetic*

11:45 – 12:10 Siegfried M. Rump (Hamburg University of Technology), *Sharp error bounds for the Gamma function over the whole floating-point range*

12:10 – 13:30 Lunch (Norrlands Nation)

13:30 – 14:30 Plenary talk (Gamla salen)

Kaori Nagatou, Karlsruhe Institute of Technology

Orbital stability investigation for travelling waves in a nonlinearly supported beam

14:30 − 17:50 Viking excursion (Gamla Uppsala)

Wednesday, September 28, 2016

09:00 − 10:00 Plenary talk (Gamla salen)

Maciej Capiński, AGH University of Science and Technology

Geometric methods and computer assisted proofs for invariant manifolds in dynamical systems

10:00 − 10:30 Coffee break

10:30 − 12:10 Parallel Sessions

Session D1: Software (Inre läs, Chair: Nathalie Revol)

10:30 − 10:55 Matthias Hüsken (University of Wuppertal), *IeeeCC754++ – an advanced tool to check IEEE 754-2008 conformity*

10:55 − 11:20 François Févotte (EDF R&D), *VERROU: CESTAC without recompilation*

11:20 − 11:45 Romain Picot (Sorbonne Universités, EDF R&D), *PROMISE: floating-point precision tuning with stochastic arithmetic*

11:45 − 12:10 David P. Sanders (Universidad Nacional Autónoma de México (UNAM)), *The Julia package* `ValidatedNumerics.jl` *and its application to the rigorous characterization of open billiard models*

Session D2: General (Gamla salen, Chair: Luc Jaulin)

10:30 − 10:55 Peter Franek (IST Austria), *Zero Verification in Systems of Equations: Interval-based Implementation of a Topological Test*

10:55 − 11:20 David Romero i Sànchez (Universitat Autònoma de Barcelona), *Numerical computation of invariant objects with wavelets*

11:20 − 11:45 Denis Gaidashev (Uppsala University), *Golden-mean universality for Siegel disks*

11:45 − 12:10 Pedro Barragan (University of Texas at El Paso), *Why superellipsoids: an explanation*

12:10 − 13:30 Lunch (Norrlands Nation)

13:30 − 14:30 Plenary talk (Gamla salen)

Martine Ceberio, University of Texas at El Paso

Using Interval Methods to handle Large Numerical Simulations

14:30 − 15:20 Parallel Sessions

Session E1: PDEs (Inre läs, Chair: Michael Plum)

14:30 − 14:55 Jonathan Wunderlich (Karlsruhe Institute of Technology), *Computer-assisted existence proofs for one-dimensional Schrödinger-Poisson systems*

14:55 − 15:20 Hussein Awala (Temple University), *Validated Numerics Methods for the Mixed Boundary Value Problem for the System of Elastostatics*

Session E2: General (Gamla salen, Chair: Denis Gaidashev)

14:30 − 14:55 Ivo List (University of Ljubljana), *Efficient Dedekind reals in Haskell*

14:55 − 15:20 Anastasia Volkova (Sorbonne Universités, UPMC), *Computing the Worst-Case Peak Gain of Digital Filter in Interval Arithmetic*

15:20 − 15:50 Coffee break

15:50 − 17:55 Parallel Sessions

Session F1: ODEs (Inre läs, Chair: Michael Plum)

15:50 − 16:15 Nobito Yamamoto (The University of Electro-Communications), *Numerical verification of existence of homoclinic orbits in dynamical systems*

16:15 − 16:40 Kaname Matsue (The Institute of Statistical Mathematics), *Rigorous numerics of global trajectories for fast-slow systems with an explicit range of multi-scale parameter*

16:40 − 17:05 Alexandre Chapoutot (ENSTA ParisTech, Université Paris-Saclay), *Runge-Kutta Theory and Constraint Programming*

17:05 − 17:30 Irmina Walawska (Jagiellonian University), *An implicit algorithm for validated enclosures of the solutions to variational equations for ODEs*

17:30 − 17:55 Florent Bréhard (LAAS-CNRS), *A New Efficient Algorithm for Computing Validated Chebyshev Approximations Solutions of Linear Differential Equations*

Session F2: PDEs (Gamla salen, Chair: Vladik Kreinovich)

15:50 − 16:15 Takuma Kimura (Saga University), *Optimal order constructive a priori error estimates for a full discrete approximation of the heat equation*

16:15 − 16:40 Kouta Sekine (Waseda university), *A norm estimation for an inverse of linear operator using a minimal eigenvalue*

16:40 − 17:05 Akitoshi Takayasu (University of Tsukuba), *On verification methods for parabolic partial differential equations using the evolution operator*

17:05 − 17:30 Kazuaki Tanaka (Waseda University), *On verified numerical computation for positive solutions to elliptic boundary value problems*

17:30 − 17:55 Yoshitaka Watanabe (Kyushu University), *Validated constructive error estimatations for bi-harmonic problems*

19:00 − late Conference Banquet

Thursday, September 29, 2016

09:00 − 10:00 Plenary talk (Gamla salen)
Weldon A. Lodwick, University of Colorado Denver
The Molecular Distance Geometry Problem Under Interval Uncertainty

10:00 − 10:30 Coffee break

10:30 − 12:10 Parallel Sessions

Session G1: Multiprecision (Inre läs, Chair: Denis Gaidashev)

10:30 − 10:55 Valentina Popescu (LIP, ENS-Lyon), *Rigourous error bounds for double-double operations*

10:55 − 11:20 Nozomu Matsuda (The University of Electro-Communications), *LILIB – Long Interval Library*

11:20 − 11:45 Hao Jiang (National University of Defense Technology), *The Implementation of multi-precision package in multiple-component format in MATLAB*

11:45 − 12:10 Clothilde Jeangoudoux (Sorbonne Universités, UPMC), *A Decimal Multiple-Precision Interval Arithmetic Library*

Session G2: General (Gamla salen, Chair: Vladik Kreinovich)

10:30 − 10:55 Evgenija D. Popova (Bulgarian Academy of Sciences), *Enclosing the Solution Set to Interval Parametric Matrix Equation $A(p)X = B(p)$*

10:55 − 11:20 Aymeric Grodet (Ehime University), *Adaptive mesh refinement technique for the classical Plateau problem*

11:20 − 11:45 Takuya Tsuchiya (Ehime University), *Error Analysis of Lagrange Interpolation on Tetrahedrons*

11:45 − 12:10 Ronald van Nooijen (Delft University of Technology), *The properties of negation and zero in ringoids as defined by Kulisch*

12:10 − 13:30 Lunch (Norrlands Nation)

13:30 − 14:30 Plenary talk (Gamla salen)

Jean-Philippe Lessard, Université Laval

Rigorously verified computing for infinite dimensional nonlinear dynamics: a functional analytic approach

14:30 − 15:20 Parallel Sessions

Session H1: Control (Inre läs, Chair: Andreas Rauh)

14:30 − 14:55 Shinya Miyajima (Iwate University), *Fast validated computation for solutions of algebraic Riccati equations arising in transport theory*

14:55 − 15:20 Shinya Miyajima (Iwate University), *Fast validated computation for solutions of discrete-time algebraic Riccati equations*

Session H2: (Gamla salen, Chair: Luc Jaulin)

14:30 − 14:55 Radoslav Paulen (Technische Universität Dortmund), *Model-based design of optimal experiments for guaranteed parameter estimation of nonlinear dynamic systems*

14:55 − 15:20 Balázs Bánhelyi (University of Szeged), *Interval based checking algorithm fit to the parallel architecture of GPUs with an application to circle covering problems*

15:20 − 15:50 Coffee break

15:50 − 17:05 Parallel Sessions

Session I1: General (Inre läs, Chair: Denis Gaidashev)

15:50 − 16:15 Milan Hladík (Charles University), *When dependencies do not matter?*

16:15 − 16:40 Antoine Plet (LIP, ENS Lyon) *Sharp error bounds for complex floating-point inversion*

16:40 − 17:05 Vladik Kreinovich (University of Texas at El Paso), *Decision Making Under Interval Uncertainty as a Natural Example of a Quandle*

Session I2: Constraints (Gamla salen, Chair: Luc Jaulin)

15:50 − 16:15 Bartłomiej Kubica (Warsaw University of Life Sciences), *A template-based C++ library for automatic differentiation and hull consistency enforcing*

16:15 − 16:40 Benoit Desrochers (ENSTA Bretagne), *Relaxed intersection of thick sets*

16:40 − 17:05 Stefan Ratschan (Czech Academy of Sciences), *Safety Verification By Interval Based Quantified Constraint Solving*

End of SCAN 2016