SCAN'2012 program

September 23-29, 2012
Novosibirsk, Russia

`http://conf.nsc.ru/scan2012`

September 24, 2012 (Monday)
House of Scientists ("Dom Uchenykh")

8^{30} – 9^{30} — registration in the lobby of Small Hall

9^{30} –10^{40} — plenary session (Small Hall), Chair — Prof. Sergey P. Shary

Opening of SCAN'2012

R.E. Moore Prize awarding ceremony

Luc Jaulin (France)
Interval analysis in robotics

10^{40} — 11^{05} – coffee break

11^{05} – 12^{45} — regular sessions

Section «Computer arithmetics and software tools - 1» (Small Hall)

Tomas Dzetkulic (Czech Republic)
Endpoint and midpoint interval representations — theoretical and computational comparison

Olga Kupriyanova, Christoph Lauter (France)
The `libieee754` compliance library for the IEEE 754-2008 standard

Laurent Thévenoux, Matthieu Martel, Philippe Langlois (France)
Automatic code transformation to optimize accuracy and speed in floating-point arithmetic

Naoya Yamanaka, Shin'ichi Oishi (Japan)
Fast infimum-supremum interval operations for double-double arithmetic in rounding-to-nearest

Section «Dynamic systems» (Musical Salon)

Ekaterina Auer, Stefan Kiel (Germany)
Uses of verified methods for solving non-smooth initial value problems

Elena Kostousova (Russia)
On boundedness and unboundedness of polyhedral estimates for reachable sets of linear systems

Andreas Rauh, Ekaterina Auer, Ramona Westphal, Harald Aschemann (Germany)
Exponential enclosure techniques for the computation of guaranteed state enclosures in ValEncIA-IVP

Vladimir V. Dombrovskii, Elena V. Chausova (Russia)
Model predictive control of discrete linear systems with interval and stochastic uncertainties

12^{45} — 14^{30} – lunch

14^{30} – 16^{10} — plenary session (Small Hall), Chair – Prof. Walter Krämer

Markus Neher (Germany)
Verified integration of ODEs with Taylor models

Yaroslav D. Sergeev (Russia-Italy)
Deterministic global optimization using the Lipschitz condition

16^{10} — 16^{35} – coffee break

16^{35} – 17^{50} — regular sessions

Section «Computer arithmetics and software tools - 2» (Small Hall)

Christoph Lauter, Valérie Ménissier-Morain (France)
There's no reliable computing without reliable access to rounding modes

Walter Krämer (Germany)
Arbitrary precision real interval and complex interval computations

Arnault Ioualalen, Matthieu Martel (France)
Sardana: an automatic tool for numerical accuracy optimization

Section «Verified numerics for differential equations» (Musical Salon)

Akitoshi Takayasu, Shin'ichi Oishi (Japan)
Computer-assisted error analysis for second-order elliptic equations in divergence form

Kouta Sekine, Akitoshi Takayasu, Shin'ichi Oishi (Japan)
A numerical verification method for solutions to systems of elliptic partial differential equations

Xuefeng Liu, Shin'ichi Oishi (Japan)
A framework of high precision eigenvalue estimation for selfadjoint elliptic differential operator

19^{00} — Welcome party (Restaurant of House of Scientists)

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September 25, 2012 (Tuesday)
Institute of Computational Technologies

9^{00} – 10^{40} — regular sessions

Section «Computer arithmetics and software tools - 3» (Room 411)

Alexandre Chapoutot, Laurent-Stéphane Didier, Fanny Villers (France)
A statistical inference model for the dynamic range of LTI systems

Alexandre Chapoutot, Thibault Hilaire, Philippe Chevrel (France)
Interval-based robustness of linear parameterized filters

Yaroslav D. Sergeev (Italy)
The Infinity Computer and numerical computations with infinite and infinitesimal numbers

Sethy Montan, Jean-Marie Chesneaux, Christophe Denis, Jean-Luc Lamotte (France)
Towards an efficient implementation of CADNA in the BLAS: example of the routine `DgemmCADNA`

Section «Linear problems - 1» (Room 513)

Vadim S. Dronov (Russia)
Limitations of complex interval Gauss-Seidel iterations

Michal Černy, Miroslav Rada (Czech Republic)
On the OLS set in linear regression with interval data

Irene A. Sharaya (Russia)
Boundary intervals and visualization of AE-solution sets for interval system of linear equations

Dmitri Yu. Lyudvin, Sergey P. Shary (Russia)
Comparisons of implementations of Rohn's modification in PPS-methods for interval linear systems

$10^{40} - 11^{05}$ – coffee break

11^{05} – 12^{45} — regular sessions

Section «Computer arithmetics and software tools - 4» (Room 411)

Oliver Heimlich, Marco Nehmeier, Jürgen Wolff von Gudenberg (Germany)
Computing interval power functions

Oliver Heimlich, Marco Nehmeier, Jürgen Wolff von Gudenberg (Germany)
Computing reverse interval power functions

Katsuhisa Ozaki, Takeshi Ogita (Japan)
Performance comparison of accurate matrix multiplication

Philippe Théveny, Nathalie Revol (France)
Interval matrix multiplication on parallel architectures

Section «Linear problems - 2» (Room 513)

Behnam Hashemi (Iran)
Verified computation of symmetric solutions to continuous-time algebraic Riccati matrix equations

Jaroslav Horaček, Milan Hladík (Czech Republic)
Computing enclosures of overdetermined interval linear systems

Alexander Prolubnikov (Russia)
An interval approach to the recognition of numerical matrices

Todor Angelov (Russia)
Solvability of systems of linear interval equations via the codifferential descent method

$12^{45} - 14^{30}$ – lunch

14^{30} – 16^{10} — regular sessions

Section «Linear problems - 3» (Room 411)

Pavel Saraev (Russia)
Interval pseudo-inverse matrices: computation and applications

Irina Surodina, Ilya Labutin (Russia)
Algorithm for sparse approximate inverse preconditioners refinement in conjugate gradient method

Anatoly V. Panyukov, Valentin A. Golodov (Russia)
Computing the best possible pseudo-solutions to interval linear systems of equations

Sergey I. Noskov (Russia)
Searching solutions to the interval multi-criteria linear programming problem

Section «Data processing - 1» (Room 513)

Semyon I. Spivak (Russia)
Informativity of experiments and uncertainty regions of model parameters

Semyon I. Spivak, Albina S. Ismagilova (Russia)
Analysis of non-uniqueness of the solution of inverse problems in the presence of measurements errors

Sergei Zhilin (Russia)
ANOVA, ANCOVA and time trends modeling: solving statistical problems using interval analysis

Konstantin K. Semenov, Gennady N. Solopchenko (Russia), Vladik Kreinovich (USA)
Processing measurement uncertainty: from intervals and p-boxes to nested intervals

$16^{10} - 16^{35}$ – coffee break

16^{35} – 17^{50} — regular sessions

Section «Decision making» (Room 411)

Boris S. Dobronets, Olga A. Popova (Russia)
Numerical probabilistic analysis under aleatory and epistemic uncertainty

Bartlomiej Jacek Kubica, Adam Wozniak (Poland)
Interval methods for computing various refinements of Nash equilibria

Alexander Harin (Russia)
Subinterval analysis. First results

Section «Data processing - 2» (Room 513)

Lev S. Terekhov, Andrey A. Lavrukhin (Russia)
On affinity of physical processes of computing and measurements

Semyon I. Spivak, Olga G. Kantor (Russia)
Interval estimation of system dynamics model parameters

Ilshat R. Salakhov, Olga G. Kantor (Russia)
Estimation of model parameters

September 26, 2012 (Wednesday)

House of Scientists ("Dom Uchenykh")

9^{00} –10^{40} — plenary session (Small Hall), Chair – Prof. Nathalie Revol

Takeshi Ogita (Japan)
Verified solutions of sparse linear systems

Dmitry Nadezhin, Sergei Zhilin (Russia)
JInterval library: principles, development, and perspectives

10^{40} — 11^{05} – coffee break

11^{05} –12^{45} — plenary session (Small Hall), Chair – Prof. Siegfried Rump

Milan Hladík (Czech Republic)
New directions in interval linear programming

Evgenija D. Popova (Bulgaria)
Properties and estimations of parametric AE-solution sets

12^{45} — 14^{30} – lunch

Excursion to Central Siberian Geological Museum

Excursion to Museum of Institute of Archeology and Ethnography

Bus tour "Evening Novosibirsk"

September 27, 2012 (Thursday)

Institute of Computational Technologies

9^{00} – 10^{40} — regular sessions

Section «Computer arithmetics and software tools - 5» (Room 411)

Pierre Fortin, Mourad Gouicem, Stef Graillat (France)
Solving the Table Maker's Dilemma by reducing divergence on GPU

Siegfried M. Rump (Germany)
Interval arithmetic over finitely many endpoints

Anatoly Panyukov (Russia)
Application of redundant positional notations for increasing scalability of arithmetic algorithms

Vladimir Zhitnikov, Nataliya Sherykhalina, Sergey Porechny (Russia)
Repeated filtration of numerical results for reliable error estimation

Section «Global search methods» (Room 513)

Bartlomiej Jacek Kubica (Poland)
Excluding regions using Sobol sequences in an interval branch-and-bound method

Sergey P. Shary, Nikita V. Panov (Russia)
Randomized interval methods for global optimization

Jennifer Harlow, Raazesh Sainudiin (New Zealand), Warwick Tucker (Sweden)
Arithmetic and algebra of mapped regular pavings

Maksim Karpov (Russia)
Using interval branch-and-prune algorithm for lightning protection systems design

10^{40} — 11^{05} – coffee break

11^{05} – 12^{45} — regular sessions

Section «Linear problems - 4» (Room 411)

Shinya Miyajima (Japan)
Componentwise inclusion for solutions in least squares problems and underdetermined systems

Shinya Miyajima (Japan)
Verified computations for all generalized singular values

Anatoliy V. Lakeyev (Russia)
On unboundedness of generalized solution sets for interval linear systems

Yusuke Morikura, Katsuhisa Ozaki, Shin'ichi Oishi (Japan)
Verification methods for linear systems on a GPU

Section «Theory and algorithms for verified numerics - 1» (Room 513)

Olga Kosheleva, Vladik Kreinovich (USA)
Use of Grothendieck's inequality in interval computations: quadratic terms are estimated accurately modulo a constant factor

Stepan Gatilov (Russia)
Efficient angle summation algorithm for point inclusion test and its robustness

Tomas Dzetkulic (Czech Republic)
Rigorous computation with function enclosures in Chebyshev basis

Alexander Harin (Russia)
Theorem of interval character of incomplete knowledge. Subinterval analysis of incomplete information

14^{30} – 16^{10} — regular sessions

Section «Theory and algorithms for verified numerics - 2» (Room 411)

Tomoaki Okayama (Japan)
Error estimates with explicit constants for Sinc quadrature and Sinc indefinite integration
over infinite intervals

Alexander O. Savchenko (Russia)
Calculation of potential and attraction force of an ellipsoid

Chin-Yun Chen (Taiwan)
Numerical comparison of some verified approaches for approximate integration

Chin-Yun Chen (Taiwan)
Acceleration of the computational convergence of extended interval Newton method
for a special class of functions

Section «Control systems» (Room 513)

Thomas Dötschel, Andreas Rauh, Ekaterina Auer, Harald Aschemann (Germany)
Numerical verification and experimental validation of sliding mode control design
for uncertain thermal SOFC models

Andreas Rauh, Luise Senkel, Thomas Dötschel, Julia Kersten, Harald Aschemann (Germany)
Interval methods for model-predictive control and sensitivity-based state estimation of solid oxide
fuel cell systems

Stefan Kiel, Ekaterina Auer, Andreas Rauh (Germany)
An environment for verified modeling and simulation of solid oxide fuel cells

Maxim I. Pushkarev, Sergey A. Gaivoronsky (Russia)
Maximizing stability degree of interval systems using coefficient method

16^{10} — 16^{35} – coffee break

September 28, 2012 (Friday)
House of Scientists ("Dom Uchenykh")

9^{00} –10^{40} — regular sessions

Section «Data processing - 3» (Small Hall)

Nikolay Oskorbin, Sergei Zhilin (Russia)
On methodological foundations of interval analysis of empirical dependencies

Sergey I. Kumkov, Yuliya V. Mikushina (Russia)
Interval approach to identification of parameters of experimental process model

Christian Servin, Craig Tweedie, Aaron Velasco (USA)
Towards a more realistic treatment of uncertainty in Earth and environmental sciences:
beyond a simplified subdivision into interval and random components

Boris I. Kvasov (Russia)
Monotone and convex interpolation by weighted quadratic splines

Section «Theory and algorithms for verified numerics - 3» (Musical Salon)

Christophe Mouilleron, Amine Najahi, Guillaume Revy (France)
Approach based on instruction selection for fast and certified code generation

Nikolay Shilov (Russia)
Verified templates for design of combinatorial algorithms

Akitoshi Kawamura (Japan), Norbert Müller, Carsten Rösnick, Martin Ziegler (Germany)
Uniform second-order polynomial-time computable operators and data structures for real analytic functions

Masahide Kashiwagi (Japan)
An algorithm to reduce the number of dummy variables in affine arithmetic

$10^{40} - 10^{05}$ – coffee break

$11^{05} - 12^{45}$ — plenary session (Small Hall), Chair — Prof. Sergey P. Shary

Vladik Kreinovich (USA)
Decision making under interval uncertainty

Closing of SCAN'2012

On September 28, 2012, at 15^{00}, the annual meeting of IEEE P1788 committee

is to be held in Institute of Computational Technologies SD RAS, Room 411.

Chair – Prof. Nathalie Revol