# Table of Contents

SYNASC 2007  
Ninth International Symposium on Symbolic and Numeric Algorithms for Scientific Computing

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>xi</td>
</tr>
<tr>
<td>SYNASC 2007 Committees</td>
<td>xii</td>
</tr>
<tr>
<td>ACSys 2007 Committees</td>
<td>xiii</td>
</tr>
<tr>
<td>GridCAD 2007 Committees</td>
<td>xiii</td>
</tr>
<tr>
<td>IMNE 2007 Committees</td>
<td>xiv</td>
</tr>
<tr>
<td>NCA 2007 Committees</td>
<td>xiv</td>
</tr>
<tr>
<td>RTES 2007 Committees</td>
<td>xv</td>
</tr>
<tr>
<td>RuleApps 2007 Committees</td>
<td>xv</td>
</tr>
<tr>
<td>Wf&amp;PM 2007 Committees</td>
<td>xvi</td>
</tr>
</tbody>
</table>

## Invited Talks

- The Gradual Computerisation of Mathematics in MathLang ................................................................. 3  
  *Fairouz Kamareddine*

- SymGrid: A Framework for Symbolic Computations on the Grid ............................................................. 4  
  *Kevin Hammond*

- Relational Declarative Programming with JBoss Drools ........................................................................ 5  
  *Mark Proctor*

- P2P Open Agent Networks for Decision Making .................................................................................. 6  
  *Vladimir Gorodetsky, Oleg Karsaev, Vladimir Samoylov, and Sergey Serebryakov*

- Some Applications of Weakly Picard Operators .................................................................................. 7  
  *Ioan A. Rus*

- Journal as Active Math-Agents: Outline of a Project with a Mathematics Publisher ......................... 11  
  *Bruno Buchberger*

- Modeling Origami and Beyond .............................................................................................................. 13  
  *Tetsuo Ida*
Automated Reasoning and Formal Verification

‘Descente Infinie’ Induction-Based Saturation Procedures ................................................................. 17
Sorin Stratulat

A Tool for Calculating Exponential Run-Time Properties ................................................................. 25
Hugh Anderson, Siau-Cheng Khoo, and Yijie Liu

Strategy-Based and Knowledge-Based Models of Information Flow: Equivalence and Decidability .................. 33
Catalin Dima, Constantin Enea, Radu Gramatovici, and Alexandru Sofronia

Decompositions of Natural Numbers: From a Case Study in Mathematical Theory Exploration .................. 41
Adrian Crăciun and Mădălina Hodorog

Parallel and Distributed Computing

Functional-Based Comparison between Two Special Classes of Uni- and Bidirectional Systolic Arrays .......... 51
Laura Ruff

Parallel Multiple Polynomial Quadratic Sieve on Multi-Core Architectures ........................................ 59
Georgiana Macariu and Dana Petcu

Branching Programs, Grammar Systems and the NC^1 Class ............................................................... 66
Liliana Cojocaru

Structural Properties and Observability in Membrane Systems ......................................................... 74
Bogdan Aman and Gabriel Ciobanu

Formal Verification and Software Quality

Proving Behavioral Commutativity with CIRC ...................................................................................... 85
Dorel Lucanu

Identification of Relational Discrepancies between Database Schemas and Source-Code in Enterprise Applications ................................................................................................................. 93
Cristina Marinescu

McC and Mc#: Unified C++ and C# Design Facts Extractors Tools .................................................... 101
Petru Florin Mihancea, George Ganea, Ioana Verebi, Cristina Marinescu, and Radu Marinescu

Sharing Rules between JBoss and Jena ................................................................................................. 105
Oana Nicolae, Ion-Mircea Diaconescu, Adrian Gurusca, and Gerd Wgner

Symbolic and Numeric Algorithms

Approximation of Attractors by a Variable Time-Stepping Algorithm for Runge-Kutta Methods .............. 111
Petre Băzăvan

Runge-Kutta Methods and Inverse Hermite Interpolation ..................................................................... 118
Radu Tiberiu Trîmbiţaş and Maria Gabriela Trîmbiţaş

Customized Reflection Lines for Surface Interrogation in Car Body Design ........................................... 124
Dan Eugen Ulmet

Invariance in the Class of Weighted Power Means .................................................................................. 130
Iulia Costin
Data Mining

Principal Directions-Based Algorithm for Classification Tasks ................................................................. 137
  Luminita State, Catalina Cocianu, Panayiotis Vlamos, and Doru Constantin

Implication-Based Support Measures for Fuzzy Association Rules .......................................................... 144
  Ion Iancu, Mihai Gabroveniu, Mirel Cosulschi, and Nicolae Constantinescu

Using Shannon Entropy in ETL Processes ......................................................................................... 151
  Marian Balta and Victor Felea

Wikipedia-Based Kernels for Text Categorization .................................................................................. 157
  Zsolt Minier, Zalán Bodó, and Lehel Csató

On Equivalence of Queries Using Views ............................................................................................... 165
  Victor Felea and Marian Balta

Formal Verification and Security

Weighted Threshold RSA Based on the Chinese Remainder Theorem .................................................. 175
  Sorin Iftene and Manuela Grindei

An Extension of the RSA Trapdoor in a KEM/DEM Framework ............................................................. 182
  Bogdan Groza

Automatic State-Based Test Generation Using Genetic Algorithms ....................................................... 188
  Raluca Lefticaru and Florentin Ipate

Approximate Satisfiability Counting ....................................................................................................... 196
  Stefan Andrei, Gabriel Manolache, Roland H.C. Yap, and Victor Felea

Image and Text Processing

Image-Adaptive Watermarking Using JSEG Segmentation Technique ..................................................... 205
  Monica Radulescu and Felicia Ionescu

Semantic Categorization and Retrieval of Images .................................................................................. 211
  Anca Loredana Ion, Liana Stanescu, and Dan Burdescu

A Distributed Architecture System for Recognizing Textual Entailment ................................................ 219
  Adrian Iftene, Alexandra Balahur-Dobrescu, and Daniel Matei

ACSys: Workshop on Agents for Complex Systems

An Agent for Constraint Acquisition and Emergence ............................................................................. 229
  Joël Quinqueton, Gilles Raymond, and Christian Bessière

Adaptive Information Provisioning in an Agent-Based Virtual Organization—Preliminary Considerations .................................................. 235
  Maria Ganzha, Marcin Paprzycki, Maciej Gawinecki, Michal Szyniszak, Grzegorz Frackowiak, Costin Bădică, Elvira Popescu, and Myon-Woong Park

Dynamic Workflow in Grid-MAS Integration Context ........................................................................... 242
  Paola Salle, Frédéric Duvert, Daniele Herin, and Stefano A. Cerri

The CMDS Medical Diagnosis System ................................................................................................. 246
  Barna Laszlo Iantovics

Adaptive Negotiation Based on Rewards and Regret in a Multi-Agent Environment ............................... 254
  Adina Magda Florea and Eugenia Kalisz
Experimental Analysis of the Impact of the Message Management in the Case of the ABT Family

Horia Emil Popa, Ionel Muscalagiu, Diana Maria Muscalagiu, and Viorel Negru

Building Agent-Based Simulations Using Structural and Process Mental Models

Marco Stuit, Nick Szirbik, and Hans Wortmann

AgentDiscover: A Multi-Agent System for Knowledge Discovery from Databases

Horia Popa, Daniel Pop, Viorel Negru, and Daniela Zaharie

GridCAD: Workshop on Grid Computing Applications Development

Parallel CBIR System for Efficient Hyperspectral Image Retrieval from Heterogeneous Networks of Workstations

Antonio Plaza, Javier Plaza, Abel Paz, and Soraya Blazquez

Grid Service for Environmental Data Retrieval and Disasters Detection Based on Satellite Image Analysis

Mihai Pantelimon, Florin Pop, and Valentin Cristea

Cluster-Based Implementation of a Morphological Watershed Algorithm for Parallel Classification of Multichannel Images

Antonio J. Plaza

Remote Control for Graphic Applications

Marc Eduard Frîncu and Dana Petcu

Automatic and Reliable Distribution of Data in Grids over Globus Toolkit

Adrian Coleșa, Teodor Pop, Iosif Ignat, and Cosmin Ardelean

A Performance Analysis on Message Passing Tools for the Grid

Dacian Tudor, Georgiana Macariu, and Vladimir Crețu

Finding the Optimal Read Buffer Size for Grid Applications

Rodica Potolea and Alin Suciu

Composing Web-Based Mathematical Services

Alexandru Cărstea, Georgiana Macariu, Marc Frîncu, and Dana Petcu

Mineral Explorations by Landsat Image Ratios

Mircea Alexandru Imbroane, Cornelia Melenti, and Dorian Gorgan

Diagrammatic Description of Satellite Image Processing Workflow

Anca Rada, Victor Bucu, and Dorian Gorgan

GLinda – Grid-Based Distributed Linda System

Kinga Ildiko Márton and Adrian Coleșa

A Distributed Algorithm for Multispectral Image Segmentation

Claudiu Gruia, Florin Pop, and Valentin Cristea

Peer-to-Peer Wikis: Replication of Highly Dynamic Content on XWiki

Sergiu Dumitriu and Sabin Corneliu Buraga

IMNE: Workshop on Iterative Methods for Nonlinear Equations

On a Steffensen Type Method

Ion Păvăloiu and Emil Cătinaș

Strong Convergence of the Projection Method in Convex Feasibility Problem

Stefan Maruster and Cristina Popirlan
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Algorithm that Determines the Start Iteration of the Halley-Altman Method</td>
<td>381</td>
</tr>
<tr>
<td>Octavian Cira and Cristian Mihai Cira</td>
<td></td>
</tr>
<tr>
<td>Iterative Approximation of Fixed Points of Almost Contractions</td>
<td>387</td>
</tr>
<tr>
<td>Vasile Berinde and Mădălina Păcurar</td>
<td></td>
</tr>
<tr>
<td><strong>NCA: Workshop on Natural Computing and Applications</strong></td>
<td></td>
</tr>
<tr>
<td>A Hybrid Genetic Programming and Boosting Technique for Learning</td>
<td>395</td>
</tr>
<tr>
<td>Kernel Functions from Training Data</td>
<td></td>
</tr>
<tr>
<td>Marta Gîrdea and Liviu Ciortuz</td>
<td></td>
</tr>
<tr>
<td>AdaGEP - An Adaptive Gene Expression Programming Algorithm</td>
<td>403</td>
</tr>
<tr>
<td>Elena Băătu, Andrei Băătu, and Henri Luchian</td>
<td></td>
</tr>
<tr>
<td>Graph Rewriting and Strategies for Modeling Biochemical Networks</td>
<td>407</td>
</tr>
<tr>
<td>Oana Andrei and Hêlêne Kirchner</td>
<td></td>
</tr>
<tr>
<td>Particle Swarm Optimization Hybrids for Searching Ground States of Ising Spin Glasses</td>
<td>415</td>
</tr>
<tr>
<td>Andrei Băătu, Elena Băătu, and Henri Luchian</td>
<td></td>
</tr>
<tr>
<td>An Application of Ant Colony Optimization to Decision Making on Affective Virtual Entities</td>
<td>419</td>
</tr>
<tr>
<td>Jose Antonio Mocholi and Javier Jaen</td>
<td></td>
</tr>
<tr>
<td>Overrepresentations in Neutral Genotype–Phenotype Mappings and their Applications</td>
<td>427</td>
</tr>
<tr>
<td>David Iclăianzan and D. Dumitrescu</td>
<td></td>
</tr>
<tr>
<td>Designing Fast and Accurate Fuzzy Approximators with Kohonen Networks</td>
<td>433</td>
</tr>
<tr>
<td>and Genetic Algorithms</td>
<td></td>
</tr>
<tr>
<td>Octav Brudaru and Octavian Buzatu</td>
<td></td>
</tr>
<tr>
<td>David Iclăianzan, Péter-István Fülöp, and D. Dumitrescu</td>
<td></td>
</tr>
<tr>
<td>A Bio-Inspired Approach for a Dynamic Railway Problem</td>
<td>449</td>
</tr>
<tr>
<td>Petrica Claudiu Pop, Camelia-Mihaela Pintea, Corina Pop Sitar, and Dumitru Dumitrescu</td>
<td></td>
</tr>
<tr>
<td>A Hybrid Genetic Algorithm Based on the Potts System</td>
<td>453</td>
</tr>
<tr>
<td>Laura Dioșan and Dumitru Dumitrescu</td>
<td></td>
</tr>
<tr>
<td><strong>RTES: Workshop on Real Time and Embedded Systems</strong></td>
<td></td>
</tr>
<tr>
<td>BluEJAMM: A Bluespec Embedded Java Architecture with Memory Management</td>
<td>459</td>
</tr>
<tr>
<td>Flavius Gruian and Mark Westmijze</td>
<td></td>
</tr>
<tr>
<td>PEARLS: An Integrated Environment for Task Scheduling</td>
<td>467</td>
</tr>
<tr>
<td>Nilam Chand, Bindiya Mansharamani, Rafael Romero, Will Beazley, and Ștefan Andrei</td>
<td></td>
</tr>
<tr>
<td>Path-Constrained Relaxed Schedulability Analysis</td>
<td>474</td>
</tr>
<tr>
<td>Ștefan Andrei and Samarjit Chakraborty</td>
<td></td>
</tr>
<tr>
<td><strong>RuleApps: Workshop on Rule-Based Applications</strong></td>
<td></td>
</tr>
<tr>
<td>Rule Modeling and Interchange</td>
<td>485</td>
</tr>
<tr>
<td>Adrian Giurca and Gerd Wagner</td>
<td></td>
</tr>
<tr>
<td>Rules for Learner Modeling and Adaptation Provisioning in an Educational Hypermedia System</td>
<td>492</td>
</tr>
<tr>
<td>Elvira Popescu, Costin Bădică, and Philippe Trigano</td>
<td></td>
</tr>
<tr>
<td>Proposal of Business Process and Rules Modeling with the XTT Method</td>
<td>500</td>
</tr>
<tr>
<td>Grzegorz J. Nalepa</td>
<td></td>
</tr>
</tbody>
</table>
Towards Using Grid Services for Mining Fuzzy Association Rules
Mihai Gabroveanu, Ion Iancu, Mirel Cosulschi, and Nicolae Constantinescu

Using E-Connection and Description Logic for Formalizing and Analyzing High-Level Petri Net
Lu Songfeng, Sun Chengfu, and Ma Xinjian

Towards a Mapping from Java Vocabulary to RDFS
Ion-Mircea Diaconescu and Gerd Wagner

WfPM: Workshop on Workflows and Process Management

Towards Build-Time Interoperability of Workflow Definition Languages
Sarah D. Induruwa Fernando, Douglas A. Creager, and Andrew C. Simpson

A Reflective PN-Based Approach to Dynamic Workflow Change
Lorenzo Capra and Walter Cazzola

A Process Mining Approach to Redesign Business Processes — A Case Study in Gas Industry
N.R.T.P. van Beest and L. Mărușter

Author Index