

The workshop on Boolean problems has an emphasis on the problems related to the solution of all kinds of high-dimension Boolean and discrete problems, and provides a forum for researchers and engineers from different disciplines to exchange ideas. The workshop is devoted to theoretical discoveries as well as practical applications. An aim of the workshop is to initiate possible collaborative research and to find new areas of application. It is intended to publish the papers in proceedings. The invited speakers

Mitch Thornton (SMU Dallas (Texas), USA),  
 Jaap van den Herik (Tilburg University, Netherlands), and  
 Shinobu Nagayama (Hiroshima City University, Japan)  
 are presenting essential results of their research.

#### Topics of Interest

##### Theory

Properties and applications of Boolean Algebras  
 Data Structures and Algorithms  
 Modeling  
 Specification of data structures/Algorithms  
 Complexity

##### Program Systems/Software

Fundamental software for the solution of Boolean Problems  
 Comparison of efficiency

##### Practical Applications

Application of Boolean algebra in FPGA synthesis  
 Quantum logic, reversible logic, and multi-valued logic  
 Solution of real-world problems

#### Program Committee

M. Adamski, University of Zielona Gora, Poland  
 J. Butler, Naval Postgraduate School Monterey, USA  
 R. Berghammer, C-A-University of Kiel, Germany  
 L. Cheremisinova, Minsk Academy of Science, Belarus  
 D. Debnath, Oakland University, USA  
 R. Drechsler, University of Bremen, Germany  
 E. Dubrova, Royal Institute of Technology (KTH), Sweden  
 G. Dueck, University of New Brunswick, Canada  
 V. Gaudet, University of Waterloo, Ontario, Canada  
 D. Große, University of Bremen, Germany  
 A. Karatkevich, University of Zielona Gora, Poland  
 P. Kerntopf, Warsaw University of Technology and  
 University of Lodz, Poland  
 I. Levin, Tel Aviv University, Israel  
 T. Luba, Warsaw University of Technology, Poland  
 M. Lukac, Tohoku University, Sendai, Japan  
 M. Miller, University of Victoria, Canada  
 C. Moraga, TU Dortmund, Germany  
 M. A. Perkowski, Portland State University, USA  
 Y. Pottosin, Minsk Academy of Science, Belarus  
 T. Sasao, Kyushu Institute of Technology, Japan  
 Ch. Schöll, University of Freiburg, Germany  
 R. Stankovic, University of Nis, Serbia  
 B. Steinbach, University of Freiberg, Germany  
 R. Ubar, Tallinn Technical University, Estonia  
 M. Velev, Aries Design Automation, USA  
 A. De Vos, University of Gent, Belgium  
 S. Yanushkevich, University of Calgary, Canada

#### General Chair

Prof. Dr.-Ing. habil. B. Steinbach

#### Location of the Workshop

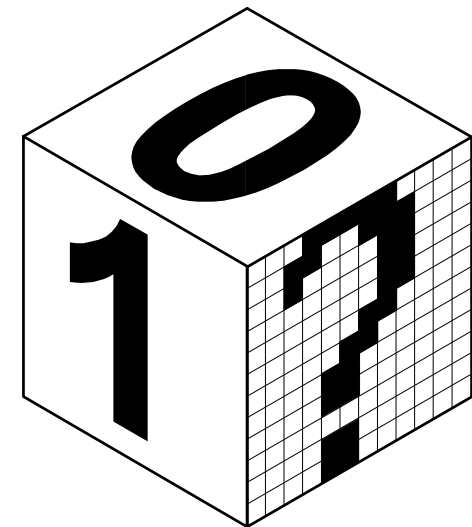
Room FOR-0241,  
 Bernhard-von-Cotta Str. 4, 09596 Freiberg, Germany

The **conference office** will be open from 8:00, Wednesday,  
 September 17, 2014.



Freiberg University  
 of Mining and Technology

# 11<sup>th</sup> International Workshop on Boolean Problems



**September 17-19, 2014  
 Freiberg (Sachsen)**

## Program

### Wednesday, September 17, 2014

#### 9:00 - 10:00 Invited Talk (Mitchell A. Thornton)

Mitchell A. Thornton (Southern Methodist University, Dallas, Texas, USA):

A Vector Space Model for Boolean Switching Networks

#### 10:45 - 12:15 Session 1

Christian Posthoff (The University of The West Indies, St. Augustine Campus, Trinidad & Tobago), Bernd Steinbach (Freiberg University of Mining and Technology, Germany): Solving Combinatorial Problems Using Boolean Equations

Micah A. Thornton, Mitchell A. Thornton (Southern Methodist University, Dallas, Texas, USA):

On the Relationship of Boolean Function Spectra and Circuit Output Probabilities

Claudio Moraga (European Centre for Soft Computing, Mieres, Asturias, Spain, TU Dortmund University, Germany), Milena Stanković, Radomir S. Stanković (Dept. Computer Science, Faculty of Electronic Engineering, Niš, Serbia): Some Properties of Ternary Functions with Bent Reed-Muller Spectra

#### 13:45 - 15:15 Session 2

Stelvio Cimato, Valentina Ciriani (Università degli Studi di Milano, Italy), Matteo Moroni (Università degli Studi di Milano, Italy):

ESOP Synthesis for Secure Computation

Rudolf Berghammer and Stefan Bolus (University Kiel, Germany):

ROBDD-based Computation of Sets of Minimal and Maximal Sets with RelView Applications

Jan Schmidt, Rudolf Blažek, Petr Fišer (Czech Technical University, Prague, Czech):

On Probability Density Distribution of Randomized Algorithms Performance

#### 16:00 - 17:00 Session 3

Bernd Steinbach, Matthias Werner (Freiberg University of Mining and Technology, Freiberg, Germany):

XBOOLE-CUDA Fast Boolean Operations on the GPU

Radomir S. Stanković, Dušan Gajić, Suzana Stojković, Miloš Radmanović (Dept. of Computer Science, Faculty of Electronics, Niš, Serbia):

Remarks on Efficient Computing of the Gibbs Dyadic Derivatives

#### 18:00 Excursion “Krügerhaus”

### Thursday, September 18, 2014

#### 9:00 - 10:00 Invited Talk (Jaap van den Herik)

Ben Ruijl (Nikhef, Amsterdam and Leiden University, The Netherlands), Jos Vermaseren (Nikhef, Amsterdam, The Netherlands), Aske Plaat (Leiden University, The Netherlands), Jaap van den Herik (Leiden University, The Netherlands):

HEPGAME and the Simplification of Expressions

#### 10:45 - 12:15 Session 4

Claudio Moraga (European Centre for Soft Computing, Mieres, Asturias, Spain and TU Dortmund University, Germany), Fatima Hadjam (European Centre for Soft Computing, Mieres, Asturias, Spain and Djillali Liabes University, Sidi Bel Abbes, Algeria):

Symbolic Calculations in Reversible CNQ Sub-Circuits

Jerzy Jegier (Orange Labs, Warsaw, Poland) and Pawel Kerntopf (University of Lodz, Poland):

Gate Count Minimal Reversible Circuits for Two Infinite Sequences of Self-Inverse Functions

Mathias Soeken (University of Bremen, Cyber-Physical Systems, DFKI GmbH, Bremen, Germany), Nabila Abdessaied (Cyber-Physical Systems, DFKI GmbH, Bremen, Germany), Rolf Drechsler (University of Bremen, Cyber-Physical Systems, DFKI GmbH, Bremen, Germany):

A framework for reversible circuit complexity

#### 13:45 - 15:15 Session 5

Alexis De Vos, Stijn De Baerdemacker (Universiteit Gent, Belgium):

The synthesis of a quantum circuit

Md. Mazder Rahman and Gerhard W. Dueck (University of New Brunswick, Canada):

Semi-classical Quantum Gates with 2-Qubit Operations

Wolf-Michael Wendler (Ostfalia Fachhochschule, Wolfsburg, Germany):

Symplectic Geometry in Finite Fields and an Application to Spinors

#### 16:00 - 17:00 Session 6

Günther Nieß (University of Potsdam, Germany), Thomas Kern (Infineon Technologies AG, Neubiberg, Germany), Michael Gössel (University of Potsdam, Germany):

Determination of Almost Optimal Check Bits for an Arbitrary Error Model

A. Matrosova, S. Ostanin, I. Kirienko (Tomsk State University, Russia):

All Stuck-at Fault Test Patterns and Incompletely Specified Boolean Functions

#### 19:00 Dinner

### Friday, September 19, 2014

#### 9:00 - 10:00 Invited Talk (Shinobu Nagayama)

Shinobu Nagayama, Shin'ichi Wakabayashi (Hiroshima City University, Hiroshima, Japan):

On Regular Expression Matching Methods for Fast Network Intrusion Detection Systems with High Maintainability

#### 10:45 - 12:45 Session 7

Chunhui Wu (Guangdong University of Finance, Guangzhou, China), Bernd Steinbach (Freiberg University of Mining and Technology, Freiberg, Germany):

Applications of Boolean Functions in Cryptography

E. Böhl (Reutlingen, Germany):

A Fault Attack and DPA Resistant Deterministic Random Number Generator

Danila A. Gorodecky (National Academy of Science, Belarus): Combinatorial Method of Polynomial Expansion of Symmetric Boolean Functions

Paramik Dasgupta, Parthasarathi Dasgupta, Debesh K. Das (Techno-India, Salt Lake, IIM Calcutta, Jadavpur University, India):

A Novel Algorithm for Interconnect-aware Two-level Optimization of Multi-output SOP functions

#### More Information:

[http://www.informatik.tu-freiberg.de/prof2/ws\\_bp11](http://www.informatik.tu-freiberg.de/prof2/ws_bp11)

#### Contact

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