SCSS 2014: 6th International Symposium on Symbolic Computation in Software Science

Symbolic Computation is the science of computing with symbolic objects (terms, formulae, programs, representations of algebraic objects etc.). Powerful symbolic algorithms have been developed during the past decades for the areas such as theorem proving, automated reasoning, software verification, model checking, rewriting, formalization of mathematics, network security, Groebner bases, cylindrical algebraic decomposition, characteristic sets, telescoping for recurrence relations, etc.

The purpose of the International Symposium on Symbolic Computation in Software Science - SCSS is to promote research on theoretical and practical aspects of symbolic computation in software sciences. The symposium provides a forum for active dialog between researchers from several fields of computer algebra, algebraic geometry, algorithmic combinatorics, computational logic, and software analysis and verification.

The history of the SCSS starts from internal workshops that brought together researchers from the Theorema Group (leader: Bruno Buchberger) at RISC (Research Institute for Symbolic Computation, Johannes Kepler University, Linz - Hagenberg, Austria), SCORE (Symbolic Computation Research Group, University of Tsukuba, Japan. Group leader:Tetsuo Ida), and SSFG (Software Science Foundation Group, Kyoto University, Japan. Group leader: Masahiko Sato). Later, these workshops grew to involve researchers from the Digital Security Research Unit at the Higher School of Communication of Tunis, Sup'Com (University of Carthage, Tunisia), and the Tunisian Society for Digital Security (leader: Adel Bouhoula). Since 2012, SCSS is an international symposium.

► http://www.easychair.org/smart-program/SCSS2014/index.html

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- Tetsuo Ida (University of Tsukuba, Japan)

Program Chairs

- Temur Kutsia (RISC, Johannes Kepler University Linz, Austria)
- Andrei Voronkov (University of Manchester, UK)

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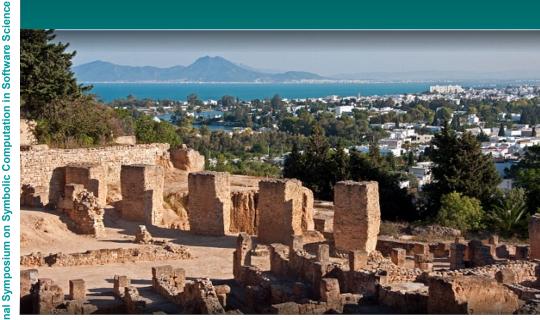- Oussama Ben Alaya (Sup'Com - University of Carthage)

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ATSN
ASSOCIATION TUNISIENNE DE LA SÉCURITÉ NUMÉRIQUE

Digital Security Research Unit

Ramada Plaza Tunis Hotel, Gammarth, Tunisia, December 07-08, 2014

In collaboration with:

SUP'COM
Ecole Supérieure des Communications de Tunis

MANCHESTER 1824
The University of Manchester

筑波大学
University of Tsukuba

UNIVERSITÉ DE CARTHAGE

JOHANNES KEPLER UNIVERSITY LINZ | JKU

RISC
Research Institute for Symbolic Computation

EOS Project

EDTiC
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Ecole Doctorale en Technologies de l'Information et de la Communication

Sunday, December 7th 2014

08:00-08:30	Session 1: Opening

● Welcome speech by Prof. Adel Bouhoula (Sup'Com - University of Carthage) President of the Tunisian Society for Digital Security and General Co-Chair of SCSS 2014
● Welcome speech by Prof. Tetsuo IDA (University of Tsukuba) General Co-Chair of SCSS 2014
● Welcome speech by Prof. Temur Kutsia (RISC, Johannes Kepler University Linz) Program Co-Chair of SCSS 2014
● Welcome speech by Prof. Andrei Voronkov (University of Manchester) Program Co-Chair of SCSS 2014
● Opening Speech

08:30-10:30 — Session 2: Invited tutorial

08:30 — Stephen M. Watt (University of Western Ontario)
Handwriting Recognition

10:30-11:00 — **Coffee Break**

11:00-12:00 — Session 3: Contributed talks

11:00 — Karsten Martiny (Hamburg University of Technology) and Ralf Moeller (TU Hamburg)
PDT Logic for Stream Reasoning in Multi-agent Systems

11:30 — Marisa Navarro (Basque Country University) and Fernando Orejas (Universitat Politècnica de Catalunya)
A refutation procedure for proving satisfiability of constraint specifications on XML documents

12:00-14:00 — **Lunch Break**

14:00-15:30 — Session 4: Invited and a contributed talk

14:00 — Nikolaj Bjorner (Microsoft Research) and Anh-Dung Phan (DTU Informatics, Techical University of Denmark)
vZ - Maximal Satisfaction with Z3

15:00 — Helmut Seidl (TU München), Thomas Martin Gawlitza (The University of Sydney) and Martin Schwarz (TU München)
Parametric Strategy Iteration

15:30-16:00 — **Coffee Break**

16:00-17:15 — Session 5: Contributed talks

16:00 — Maherzia Belaazi (Sup'Com – University of Carthage), Hanene Boussi Rahmouni (ISTMT, University of Tunis) and Adel Bouhoula (Sup'Com – University of Carthage)
A Self-Disciplined Privacy Oriented Access Control Framework for Public Clouds

16:15 — Amina Saâdaoui (Sup'Com – University of Carthage), Nihel Ben Youssef (ISI, El Manar University) and Adel Bouhoula (Sup'Com – University of Carthage)
Automated detection and resolution of firewall misconfigurations

16:30 — Alexey Kytmanov (Siberian Federal University) and Alexey Shchuplev (Siberian Federal University)
Symbolic algorithm for construction of toric compactifications

16:45 — Alexander Baumgartner (Research Institute for Symbolic Computation) and Temur Kutsia (RISC, Johannes Kepler University Linz)
A Library of Anti-Unification Algorithms

17:00 — Rui Hu (The University of Western Ontario), Vadim Mazalov (The University of Western Ontario) and Stephen M. Watt (The University of Western Ontario)
Modelling and Simulation for the Analysis of Securities Markets

19:00-22:00 — **Conference dinner**

Monday, December 8th 2014

09:00-10:00 — Session 6: Invited talk

09:00 — William Farmer (McMaster University)
Meaning Formulas for Syntax-Based Mathematical Algorithms
ABSTRACT: A meaning formula for a symbolic algorithm is a statement that captures the mathematical relationship between the input and output expressions of the algorithm. We examine how meaning formulas can be expressed and proved in a formal logic and how they can be used to represent mathematical knowledge and to define mathematical services.

10:00-10:30 — **Coffee Break**

10:30-12:00 — Session 7: Contributed talks

10:30 — Cezary Kaliszyk (University of Innsbruck), Lionel Mamane (the Catholic University of Nijmegen) and Josef Urban (Radboud University)
Machine Learning of Coq Proof Guidance: First Experiments

11:00 — Daniel Franzen (University of Edinburgh) and David Aspinall (University of Edinburgh)
Towards an amortized type system for JavaScript

11:30 — Nafi Diallo (New Jersey Institute of Technology) and Wided Ghardallou (FST – El Manar University)
Work-In-Progress: Repairing a Loop by Constructive Transformation using Mutation Analysis

11:45 — Wided Ghardallou (FST – El Manar University), Nafi Diallo (New Jersey Institute of Technology) and Ali Mili (New Jersey Institute of Technology)
Merging Termination with Abort Freedom

12:00-14:00 — **Lunch Break**

14:00-17:00 — **Excursion**

SCSS 2014: 6th International Symposium on Symbolic Computation in Software Science

Ramada Plaza Tunis Hotel, Gammarth, Tunisia, December 07-08, 2014

ABSTRACT of invited tutorial and talks

Invited tutorial: Stephen M. Watt (University of Western Ontario) http://www.csd.uwo.ca/~watt
Handwriting Recognition

Handwritten input is increasingly important in modern computing. Tablets, electronic white boards and telephones today accept hand written input of one sort or another. Document analysis systems strive to handle handwritten annotations or entire documents using multiple languages and scripts. and large-scale business applications, such as mail sorting and cheque cashing, rely critically on computer-based handwriting recognition.

This tutorial focuses primarily on mathematical handwriting recognition. Accurate computer recognition of handwritten mathematics offers to provide a natural interface for mathematical computing, document creation and collaboration. Mathematical handwriting, however, provides a number of challenges beyond what is required for the recognition of handwritten natural languages. For example, it is usual to use symbols from a range of different alphabets and there are many similar-looking symbols. Many writers are unfamiliar with the symbols they must use and therefore write them incorrectly. Mathematical notation is two-dimensional and size and placement information is important. Additionally, there is no fixed vocabulary of mathematical ``words'' that can be used to disambiguate symbol sequences. On the other hand, there are some simplifications. For example, symbols do tend to be well-segmented. With these characteristics, new methods of character recognition are important for accurate handwritten mathematics input.

We explore the issues in handwriting recognition in general and for mathematical handwriting in particular. Special attention will be given to methods based on functional approximation of digital ink traces and general classification techniques. A section of the tutorial is devoted to issues that arise in the recognition of mathematical handwriting in Arabic documents.

Invited talk: Nikolaj Bjorner (Microsoft Research) http://research.microsoft.com/en-us/people/nbjorner
vZ - Maximal Satisfaction with Z3

Satisfiability Modulo Theories, SMT, solvers are used in many applications. These applications benefit from the power of tuned and scalable theorem proving technologies for supported logics and specialized theory solvers. SMT solvers are primarily used to determine whether formulas are satisfiable. Furthermore, when formulas are satisfiable, many applications need models that assign values to free variables. Yet, in many cases arbitrary assignments are insufficient, and what is really needed is an \emph{optimal} assignment with respect to objective functions. So far, users of Z3, an SMT solver from Microsoft Research, build custom loops to achieve objective values. This is no longer necessary with vZ (new-Z, or max-Z), an extension within Z3 that lets users formulate objective functions directly with Z3. Under the hood there is a portfolio of approaches for solving linear optimization problems over SMT formulas, MaxSMT, and their combinations. Objective functions are combined as either Pareto fronts, lexicographically, or each objective is optimized independently.

Invited talk: William Farmer (McMaster University) http://imps.mcmaster.ca/wmfarmer/
Meaning Formulas for Syntax-Based Mathematical Algorithms

A meaning formula for a symbolic algorithm is a statement that captures the mathematical relationship between the input and output expressions of the algorithm. We examine how meaning formulas can be expressed and proved in a formal logic and how they can be used to represent mathematical knowledge and to define mathematical services.

SCSS 2014 - Conference Registration

Registration for non residents in Tunisia
The Conference registration fees are as follows (All fees are listed in Euro)

Category	Early Registration Fees* (before November 20, 2014)	Late Registration Fees (after November 20, 2014)	Hotel Accommodation Supplement**
Regular paper authors	350 €	450 €	80 € / night
Short paper authors	250 €	350 €	80 € / night
Academic & Industry (1)	150 €	200 €	80 € / night

Registration for residents in Tunisia
The Conference registration fees are as follows (All fees are listed in TND)

Category	Early Registration Fees* (before November 20, 2014)	Late Registration Fees (after November 20, 2014)	Hotel Accommodation Supplement**
Regular paper authors	700 TND	900 TND	160 TND / night
Short paper authors	500 TND	700 TND	160 TND / night
Academic & Industry (1)	200 TND	300 TND	160 TND / night

*   Registration includes admission to all technical sessions, refreshment breaks, two lunches, one dinner party and one e-copy of the proceedings. The registration fees does not cover the cost of accommodation or transport, which must be borne by the participant. For authors, registration fees are due for each accepted paper. Registration fees must be paid solely by bank transfer (see below).

**   Accommodation in the symposium's hotel (Five stars hotel at Gammarth) in a single room: Bed & Breakfast. You may pay the fees for hotel accommodation by cash at registration desk in the symposium's hotel or by bank transfer along with registration fees. In the latter case, please precise the number of nights and your check-in and check-out dates. If you choose to be accommodated at symposium's hotel, we will offer free transportation from airport to hotel (send us your flight details to obtain this offer).

Please note that the symposium's hotel will be nearly at full occupancy in the symposium days. Therefore, we urge you to confirm your participation as soon as possible if you choose to be accommodated at the symposium hotel.

Registration for the conference will only be effective once all fees have been paid. Payment should be made by bank transfer to the following account:

Account Holder:	Association Tunisienne de la Sécurité Numérique (ATSN)
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Once the payment has been done, please send an email to Local Organization Chair including a scanned copy of your proof of payment (mentioning your full name, the paper ID(s) and conference name).
Email of the Local Organization Chair: medbecha.kaaniche@supcom.tn

(1) This category is eligible only for non-authors or for a paper second/third registered author along with a full registered paper first author (having paid a regular paper author registration fees or short paper author registration fees)