

EATCS-IPEC Nerode Prize 2013

On the Exact Complexity of Evaluating Quantified k -CNF

Chris Calabro, Russell Impagliazzo, Ramamohan Paturi, *Algorithmica*
2013

The complexity of Unique k -SAT: An Isolation Lemma for k -CNFs

Chris Calabro, Russell Impagliazzo, Valentine Kabanets, Ramamohan Paturi, *Journal of Computer and System Sciences* 2008

On the Complexity of k -SAT

Russell Impagliazzo, Ramamohan Paturi,
Journal of Computer and System Sciences 2001

Which Problems Have Strongly Exponential Complexity?

Russell Impagliazzo, Ramamohan Paturi, Francis Zane
Journal of Computer and System Sciences 2001

The Nerode Prize 2013 Committee, consisting of Georg Gottlob (University of Oxford, UK), Rolf Niedermeier (TU Berlin, Germany; chair), and Peter Widmayer (ETH Zurich, Switzerland), has unanimously decided to award Chris Calabro (Google Inc., Mountain View, USA), Russell Impagliazzo (UC San Diego, USA), Valentine Kabanets (Simon Fraser University, Canada), Ramamohan Paturi (UC San Diego, USA), and Francis Zane (Alcatel Lucent, Murray Hill, USA) the 2013 EATCS-IPEC Nerode Prize for outstanding papers in the area of multivariate algorithmics.

Their series of papers elaborates on what is known as the Exponential Time Hypothesis (ETH), and its stronger variant, the Strong Exponential Time Hypothesis (SETH). These complexity assumptions state lower bounds on how fast Boolean Satisfiability problems can be solved. A key result of the corresponding theory is the *Sparsification Lemma*, a core tool in the area of developing relative lower bounds for NP-hard problems, which lends credence to the ETH. Altogether, the papers open an avenue for proving exponential lower bounds (assuming ETH or SETH) for a multitude of diverse computational problems, helping to derive tight parameterized computational complexity results. This has led to numerous recent advances in the field of multivariate algorithmics, thus adding a central tool to the repertoire of worst-case complexity analysis. The obtained insights also have a strong impact on fields such as structural and communication complexity theory. The knowledge of the (S)ETH now belongs into the standard toolkit of every researcher in multivariate algorithmics.

Nerode Prize 2013

1 message

Rolf Niedermeier <rolf.niedermeier@tu-berlin.de>

Tue, Apr 2, 2013 at 7:33 AM

To: ccalabro@cs.ucsd.edu, russell@cs.ucsd.edu, rpaturi@ucsd.edu, kabanets@cs.sfu.ca, francis.zane@alcatel-lucent.com

Cc: h.l.bodlaender@uu.nl, fomin@ii.uib.no, georg.gottlob@cs.ox.ac.uk, widmayer@inf.ethz.ch, gutin@cs.rhul.ac.uk, stefan@szeider.net

Dear authors, dear colleagues,

on behalf of the Nerode Prize 2013 committee I am very happy to inform you that your series of papers

- * On the Exact Complexity of Evaluating Quantified $\text{K}^k\text{-CNF}$, Algorithmica 2013;
- * The complexity of Unique $\text{K}^k\text{-SAT}$: An Isolation Lemma for $\text{K}^k\text{-CNFs}$, JCSS 2008;
- * On the Complexity of $\text{K}^k\text{-SAT}$, JCSS 2001;
- * Which Problems Have Strongly Exponential Complexity?, JCSS 2001

has been selected to win the Nerode Prize 2013, presented by IPEC and EATCS.

My warmest congratulations!

I attach further information about the Nerode prize for outstanding papers in multivariate algorithmics, which is given out 2013 for the first time, at the end of this email.

This email is also cc'ed to the current chair of the IPEC Steering Committee, Hans L. Bodlaender, and the former chair, Fedor V. Fomin.

Further it is cc'ed to my selection committee colleagues, Georg Gottlob and Peter Widmayer.

Further, it is cc'ed to the two PC chairs Gregory Gutin and Stefan Szeider of IPEC 2013, which this year will be organized within ALGO, 2013 taking place in Sophia Antipolis, France, September 2--6.

I also attach a draft pdf (!) of the brief laudatio which, in particular, should go to EATCS. Please note that this is not yet an official document and should not be distributed. EATCS agreed to prepare some official document for you. Please let me know in case you see any inconsistencies etc. in the text.

Please note that there will be no official prize money but one of you will be invited to give a talk at IPEC 2013. In this respect, you'll soon be contacted by the IPEC 2013 chairs, Gregory Gutin and Stefan Szeider.

Best wishes,
Rolf Niedermeier
TU Berlin,
www.akt.tu-berlin.de

-----More details on Nerode Prize-----

The Nerode Prize 2013 for outstanding papers in the area of multivariate algorithmics.

The award is presented annually with the presentation taking place at IPEC (International Symposium on Parameterized and Exact Computation). IPEC 2013 takes place within ALGO 2013, September 2--6, 2013, Sophia Antipolis, France. See <http://algo2013.inria.fr/>

The Prize is named in honor of Anil Nerode in recognition of his major contributions to mathematical logic, theory of automata, computability, and complexity theory.

In 2013, the prize is awarded for the first time.

Award Committee.

The winning paper(s) is (are) selected by a committee of three members.

This year's committee consists of the following three people.

Georg Gottlob (Oxford University), georg.gottlob@cs.ox.ac.uk

Rolf Niedermeier (TU Berlin, chair), rolf.niedermeier@tu-berlin.de

Peter Widmayer (ETH Zurich), widmayer@inf.ethz.ch

The Award Committee is solely responsible for the selection of the winner of the award which may be shared by more than one paper or series of papers. The Award Committee reserves the right to declare no winner at all.

Eligibility.

Any research paper or series of research papers by a single author or by a team

of authors published in a recognized refereed journal. The year of publication should be at least two years and at most ten years before the year of

the award nomination. The research work nominated for the award should be in the area of multivariate algorithms and complexity meant in a broad sense, and

encompasses, but is not restricted to, those areas covered by IPEC. The Award Committee has the ultimate authority to decide on the eligibility of a nomination. Papers authored by a member of the Award Committee are not eligible for nomination.

Nominations.

Nominations may be made by any member of the scientific community

including the members of the Award Committee. A nomination should contain a brief summary of the technical content of each nominated paper and a brief explanation of its significance. Nominations are done by an email to the Award Committee Chair with copies to the members of the committee.



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