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Dominik Alban Scheder

Curriculum Vitae

Education and Positions

09 2014 – present **Assistant Professor**, *Shanghai Jiaotong University, Shanghai*.
Department of Computer Science and Engineering

02–08 2014 **Postdoctoral Researcher**, *Tsinghua University, Beijing*.
Institute for Interdisciplinary Information Sciences (IIIS); joint appointment with UC Berkeley

08–12 2013 **Research Fellow**, *Simons Institute for the Theory of Computing, UC Berkeley*.
Joint appointment with Tsinghua University

2011-2013 **Postdoctoral Researcher**, *Aarhus University*.
Mathematical Computer Science Group of Peter Bro Miltersen
Prospective End Date: July 2013

2005-2011 **PhD**, *ETH Zürich*.
Advisor: Emo Welzl
Thesis title: Algorithms and Extremal Properties of SAT and CSP

2003-2005 **M.Sc. in Computer Science**, *University of Colorado at Boulder*.
GPA: 3.975/4
Master's Thesis: Approaches to approximating the minimum weight k-edge connected spanning subgraph of a mixed graph
Advisor: Harold Gabow

1999-2003 **Undergraduate Student**, *Universität Erlangen-Nürnberg*, Institut für Informatik (Institute of Computer Science).

Five Most Important Publications (Chronological Order)

- Periklis Papakonstantinou, Dominik Scheder, and Hao Song. *Overlays and Limited Memory Communication*. CCC 2014.
- Joshua Brody, Sune Jakobsen, Dominik Scheder, and Peter Winkler. *Cryptogenography*. ITCS 2014.
- Dominik Scheder and Li-Yang Tan. *On the average sensitivity and density of k-CNF formulas.* RANDOM 2013
- Shiteng Chen, Navid Talebanfard, Dominik Scheder, and Bangsheng Tang. *Exponential Lower Bounds for the PPSZ k-SAT Algorithm*, SODA 2013.
- Robin A. Moser and Dominik Scheder. *A full derandomization of Schöning's k-SAT algorithm.* 43rd ACM Symposium on Theory of Computing (STOC 2011)

Other Publications

- Dominik Scheder. *Trivial, Tractable, Hard. A Not So Sudden Complexity Jump in Neighborhood Restricted CNF Formulas*. ISAAC 2013.
- Dominik Scheder. *Unsatisfiable CNF Formulas Contain Many Conflicts*. ISAAC 2013.
- Gregory Gutin, Mark Jones, Dominik Scheder, and Anders Yeo, *A New Bound for 3-Satisfiable MaxSat and its Algorithmic Application*, Information and Computation 2013.
- Timon Hertli, Robin A. Moser, and Dominik Scheder. *Improving PPSZ for 3-SAT using critical variables.* 28th International Symposium on Theoretical Aspects of Computer Science (STACS 2011)
- Dominik Scheder. *Unsatisfiable linear CNF formulas are large and complex.* Proceedings of the 27th International Symposium on Theoretical Aspects of Computer Science (STACS 2010), volume 5 of *LIPIcs*, pages 621–632. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik.
- Heidi Gebauer, Robin A. Moser, Dominik Scheder, and Emo Welzl. *The Lovász Local Lemma and satisfiability.* In Susanne Albers, Helmut Alt, and Stefan Näher, editors, *Efficient Algorithms*, LNCS 5760, 30–54, 2009.
- Dominik Scheder and Philipp Zumstein. *How many conflicts does it need to be unsatisfiable?* Proceedings of the Eleventh International Conference on Theory and Applications of Satisfiability Testing (SAT 2008), LNCS 4996, 246–256.
- Dominik Scheder. *Guided search and a faster deterministic algorithm for 3-SAT.* Proceedings of the 8th Latin American Symposium on Theoretical Informatics (LATIN 2008), LNCS 4957, 60–71.
- Claudia Käppeli and Dominik Scheder. *Partial satisfaction of k-satisfiable formulas.* European Conference on Combinatorics, Graph Theory and Application (EuroComb 2007), pages 497–501.
- Dominik Scheder and Philipp Zumstein. *Satisfiability with exponential families.* Proceedings of the 10th International Conference on Theory and Applications of Satisfiability Testing (SAT 2007), LNCS 4501, 148–158, 2007.

Program Committees

- I was on the program committee for RANDOM 2014

Workshops

In August 2012 I organized a 3-day workshop on Boolean Satisfiability. We had three invited speakers (Ramamohan Paturi, Rahul Santhanam, and Russell Impagliazzo). The workshop was divided into lectures by the invited speakers and work in small groups.

Teaching Experience

Courses

Spring 2015 *Discrete Mathematics I*, Shanghai Jiaotong University

Fall 2012 First Half of *Advanced Theoretical Computer Science*, Tsinghua University, Beijing, China

01–03/2012 *Algorithms for Boolean Satisfiability*, Aarhus University

09–10/2011 *PhD Minicourse on Expander Graphs*, Aarhus University

09/2011 *PhD Minicourse on the PCP Theorem and Hardness of Approximation*, Aarhus University

Supervised Students

10/2010 Timon Hertli, *Investigating and improving the PPSZ algorithm for SAT,* Master's Thesis supervised together with Robin A. Moser

04/2010 Stefan Kraft, *The structure of minimal unsatisfiable CNF formulas,* Master's Thesis supervised together with Heidi Gebauer

04/2010 Timon Hertli, *A simple algorithm for 3-SAT,* Bachelor Thesis

02/2008 Lucia Keller, *Probabilistic and combinatorial methods of partial satisfaction of k-satisfiable CNF formulas,* Master's Thesis

10/2007 Rafael Robleda, *A randomized approximation algorithm for the smallest bridgeless spanning subgraph problem*, Semester Thesis

07/2007 Anna Höpli, *The game of SAT*, Master's Thesis supervised together with Emo Welzl

10/2006 Claudia Käppeli, *Partial satisfaction under local constraints*, Master's Thesis supervised together with Emo Welzl

Lecture and Seminar Assistance

- *Boolean Satisfiability – Combinatorics and Algorithms*, Prof. Emo Welzl, Fall 2006, 2007, 2009, 2010
- *Algorithms, Probability, and Computing*, Prof. Thomas Holenstein and Prof. Emo Welzl, Fall 2009
- *Algorithms, Probability, and Computing*, Prof. Angelika Steger, Prof. Emo Welzl, and Prof. Peter Widmayer, Fall 2008
- *Einsatz von Informatikmitteln*, Prof. Hans Hinterberger, Spring 2008
- *SAT Seminar*, Prof. Emo Welzl, Spring 2006, 2007, 2008
- *Data Structures and Algorithms*, Prof. Peter Widmayer, Spring 2007
- *Logic*, Prof. Dmitry Feichtner-Kozlov, Fall 2005

In addition, I worked as a grader for the course *Algorithms* taught by Prof. Harold Gabow, and as a teaching assistant for several undergraduate courses at the Universität Erlangen-Nürnberg.

Selected Talks

11/2012 Dagstuhl Seminar on SAT Interactions, Schloss Dagstuhl, Germany

10/2012 Theory of Computing Seminar, Tsinghua University, Beijing, China, *Exponential Lower Bounds for the PPSZ k-SAT Algorithm.*

05/2012 Computer Science Day, Aarhus University. I presented the Mathematical Computer Science group to a general computer science audience.

03/2012 Friday Lecture, Aarhus University. I presented Bollobás' and Riordans *A short proof of the Harris-Kesten Theorem* to a general computer science audience.

10/2011 Theory of Computing Seminar, Tsinghua University, Beijing, China, *A Full Derandomization of Schöning's k-SAT Algorithm.*

03/2010 27th International Symposium on Theoretical Aspects of Computer Science (STACS '10), Nancy, France, *Unsatisfiable Linear CNF Formulas are Large and Complex*

Scholarships

08/2003 – 06/2004 **Scholarship**, *Fulbright Program*, supporting my graduate studies at the University of Colorado at Boulder.

11/1999 – 03/2004 **Scholarship**, *Bayerische Begabtenförderung*, a program of the State of Bavaria for supporting promising undergraduate students.

Language Skills

German (native language), English (fluent), Danish (fluent), Spanish (good / fluent), Italian (basic), Portuguese (basic), Chinese (very basic)