Dominik Alban Scheder

Curriculum Vitae

*Department of Computer Science
and Engineering
Shanghai Jiao Tong University
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Work Experience and Education

01/2019 – now   **Associate Professor**, *Shanghai Jiao Tong University, Shanghai*.
Department of Computer Science and Engineering

09/14 – 12/18   **Assistant Professor**, *Shanghai Jiao Tong 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

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)

- Dominik Scheder. *PPSZ is better than you think.* To appear at the 62nd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2021)
- Dominik Scheder and John Steinberger. *PPSZ for General k-SAT – Making Hertli's Analysis Simpler and 3-SAT Faster*. 32nd Computational Complexity Conference 2017 (CCC 2017).
- Periklis Papakonstantinou, Dominik Scheder and Hao Song. *Overlays and Limited Memory Communication.* 29th Conference on Computational Complexity (CCC 2014).
- Shiteng Chen, Dominik Scheder, Navid Talebanfard, and Bangsheng Tang. *Exponential Lower Bounds for the PPSZ k-SAT Algorithm.* 24th Annual ACM-SIAM Symposium on Discrete Algorithms (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)

All Publications

- Dominik Scheder. *PPSZ is better than you think.* To appear at the 62nd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2021)

- Shibo Li and Dominik Scheder. *Impatient PPSZ—a Faster algorithm for CSP.* To appear at the 32nd International Symposium on Algorithms and Computation (ISAAC 2021)

- Dominik Scheder and Navid Talebanfard. *Super Strong ETH is true for strong PPSZ with Small Resolution Width.* 35nd Computational Complexity Conference 2020 (CCC 2020).

- Dominik Scheder. *PPSZ on CSP Instances with Multiple Solutions.* Electronic Colloquium on Computational Complexity (ECCC) 25.

- Dominik Scheder, Shuyang Tang, Jiaheng Zhang. *Searching for Cryptogenography Upper Bounds via Sum of Square Programming.* 30th International Symposium on Algorithms and Computation (ISAAC 2019)

- Dominik Scheder. *PPSZ for $k \geq 5$: More Is Better.* ACM Transactions on Computation Theory (TOCT), 2019.

- Yukun Cheng, Xiaotie Deng, Dominik Scheder. *Recent studies of agent incentives in internet resource allocation and pricing.* 4OR: Quarterly Journal of the Belgian, French and Italian Operations Research Societies, 16 (2018).

- Pavel Pudlák, Dominik Scheder, Navid Talebanfard. *Tighter Hard Instances for PPSZ.* 44th International Colloquium on Automata, Languages, and Programming (ICALP 2017).

- Dominik Scheder and John Steinberger. *PPSZ for General k-SAT – Making Hertli's Analysis Simpler and 3-SAT Faster.* 32nd Computational Complexity Conference 2017 (CCC 2017).

- Timon Hertli, Isabelle Hurbain, Sebastian Millius, Robin A. Moser, Dominik Scheder, May Szedlák. *The PPSZ Algorithm for Constraint Satisfaction Problems on More Than Two Colors.* Principles and Practice of Constraint Programming - 22nd International Conference (CP 2016).

- Dominik Scheder. *Derandomization of k-SAT Algorithm.* Encyclopedia of Algorithms 2016.

- Dominik Scheder. *Exponential Lower Bounds for k-SAT Algorithms.* Encyclopedia of Algorithms 2016.

- Periklis Papakonstantinou, Dominik Scheder and Hao Song. *Overlays and Limited Memory Communication.* 29th Conference on Computational Complexity (CCC 2014).

- Joshua Brody, Sune Jakobsen, Dominik Scheder, and Peter Winkler. *Cryptogenography.* Innovations in Theoretical Computer Science (ITCS 2014).

- Dominik Scheder. *Trivial, Tractable, Hard. A Not So Sudden Complexity Jump in Neighborhood Restricted CNF Formulas.* 24th International Symposium on Algorithms and Computation (ISAAC 2013).

- Dominik Scheder. *Unsatisfiable CNF Formulas Contain Many Conflicts.* 24th International Symposium on Algorithms and Computation (ISAAC 2013).

- Dominik Scheder and Li-Yang Tan. *On the average sensitivity and density of k-CNF formulas.* 17th. International Workshop on Randomization and Computation (RANDOM 2013).
- Shiteng Chen, Dominik Scheder, Navid Talebanfard, and Bangsheng Tang. *Exponential Lower Bounds for the PPSZ k-SAT Algorithm.* 24th Annual ACM-SIAM Symposium on Discrete Algorithms SODA (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.
- Robin A. Moser and Dominik Scheder. *A full derandomization of Schöning's k-SAT algorithm.* 43rd ACM Symposium on Theory of Computing (STOC 2011)
- 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.* 27th International Symposium on Theoretical Aspects of Computer Science (STACS 2010).
- 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*, 2009.
- Dominik Scheder and Philipp Zumstein. *How many conflicts does it need to be unsatisfiable?* 11th International Conference on Theory and Applications of Satisfiability Testing (SAT 2008).
- Dominik Scheder. *Guided search and a faster deterministic algorithm for 3-SAT.* 8th Latin American Symposium on Theoretical Informatics (LATIN 2008).
- Claudia Käppeli and Dominik Scheder. *Partial satisfaction of k-satisfiable formulas.* European Conference on Combinatorics, Graph Theory and Application (EuroComb 2007).
- Dominik Scheder and Philipp Zumstein. *Satisfiability with exponential families.* 10th International Conference on Theory and Applications of Satisfiability Testing (SAT 2007).

Funding

Program Committees

- 13th International Frontiers of Algorithmics Workshop (FAW 2019), PC member.
- 12th International Frontiers of Algorithmics Workshop (FAW 2018), PC member.
- 10th International Frontiers of Algorithmics Workshop (FAW 2016), PC member.
- Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques, (APPROX/RANDOM 2014), PC member.

Teaching Experience

See attached file "teaching portfolio" for a list of courses and supervised students.