

# Johan Thapper

## Curriculum Vitae

Swedish citizen

email: [johan.thapper@u-pem.fr](mailto:johan.thapper@u-pem.fr)  
www: [igm.univ-mlv.fr/~thapper/](http://igm.univ-mlv.fr/~thapper/)

Université Paris-Est, Marne-la-Vallée  
Laboratoire d'informatique Gaspard-Monge  
5 boulevard Descartes  
F-77420 Champs-sur-Marne  
France

## Professional Experience

- |                         |   |
|-------------------------|---|
| Sep 2013–present        | <b>Université Paris-Est, Marne-la-Vallée, LIGM</b><br>Maître de Conférences in the Models and Algorithms team   |
| Sep 2012–Aug 2013       | <b>Université Paris-Sud (Paris 11), LRI</b><br>Full time ATER in the Algorithms and Complexity team   |
| Oct 2010–Sep 2012       | <b>École Polytechnique, LIX</b><br>Postdoc with Manuel Bodirsky, financed by the <i>LIX-Qualcomm Fellowship</i> (a competitive stipend; 2 fellowships awarded out of 25 applicants,) and by the project <i>CSP-Complexity</i> (ERC-2010-StG_20091028, agreement no. 257039) |
| Feb 2010–Sep 2010       | <b>École Polytechnique, LIX</b><br>Postdoc with Bernadette Charron-Bost, financed by the <i>DGA-LIX contract</i>  |
| 2007–2009               | <b>Linköping University, Dept. of Computer Science</b><br>Teaching assistant during graduate studies  |
| 2004–2005<br>(9 months) | <b>Université Lyon 1, Institut Camille Jordan</b><br>“Predoc” research position with Christian Krattenthaler, financed by the ACE ( <i>Algebraic Combinatorics in Europe</i> ) Research Training Network of the European Community  |
| 2002–2007               | <b>Linköping University, Dept. of Mathematics</b><br>Teaching assistant during graduate studies   |
| 2000–2001               | <b>Ericsson Softlab AB, Linköping, Sweden</b><br>Software developer of compilers  |

## Education

|           |  |
|-----------|--|
| 2007–2010 | <b>Ph.D., Linköping University, Dept. of Computer Science</b><br><i>Aspects of a Constraint Optimisation Problem</i><br>Peter Jonsson advisor<br>Defended on February 5, 2010                |
| 2002–2007 | <b>Licentiate, Linköping University, Dept. of Mathematics</b><br><i>Combinatorial Considerations on Two Models from Statistical Mechanics</i><br>Svante Linusson advisor                     |
| 2002      | <b>M.Sc., Linköping University, Dept. of Computer Science</b><br><i>A Combined Systematic and Randomized Algorithm for Directed <math>s - t</math> Connectivity</i><br>Peter Jonsson advisor |

## Languages

|         |               |
|---------|---------------|
| Swedish | Mother tongue |
| English | Bilingual     |
| French  | Fluent        |
| German  | Rudimentary   |

## Research

|                    |  |
|--------------------|--|
| Research interests | Complexity and approximability of constraint optimisation problems;<br>Submodular function minimisation; Constraint satisfaction problems;<br>Complexity theory; Combinatorics |
| Publications       | 12 journal articles<br>JACM, SICOMP, TOCL, TOCT, JCSS, TCS, SIDMA, IPL, DMTCS, SLC<br>16 papers in refereed conference proceedings<br>FOCS, STOC, LICS, ICALP, CSR, MFCS, CP   |

## Invited talks

|              |   |
|--------------|---|
| May 2019     | GT IM-IA, Journées plénières du GDR IA 2019   |
| October 2018 | QuantLA seminar, Universität Leipzig  |
| June 2016    | Journées Francophones de Programmation par Contraintes 2016   |
| July 2015    | Dagstuhl Seminar 15301 on the Constraint Satisfaction Problem   |
| Nov 2014     | Workshop on Algebraic and Model Theoretical Methods in Constraint Satisfaction, Banff International Research Station (BIRS) |
| Nov 2012     | Dagstuhl Seminar 12451 on the Constraint Satisfaction Problem   |
| Aug 2011     | Workshop on Algebra and CSPs, Fields Institute, Toronto   |

## Service

|                   |   |
|-------------------|---|
| Referee (journal) | ACM Transactions on Algorithms, ACM Transactions on Computation Theory, ACM Transactions on Computational Logic, Constraints, Discrete Mathematics & Theoretical Computer Science, Discrete Optimization, Electronic Journal of Combinatorics, Journal of Computer and System Sciences, Journal of the ACM, SIAM Journal on Computing, SIAM Journal on Discrete Mathematics, SIAM Journal on Optimization |
| Referee (conf.)   | AAAI, CCC, CCIA, CP, CPAIOR, CSL, CSR, ICALP, IJCAI, JFPC, LATIN, LICS, MFCS, SODA, STACS   |
| Prog. committee   | IJCAI'11, CP'14   |
| Org. committee    | FPSAC'03 (Vadstena, Sweden)   |

## Publications

### Journals

- [J12] Jean-Alexandre Anglès d'Auriac, Csilla Bujtás, Hakim El Maftouhi, Marek Karpinski, Yannis Manoussakis, Leandro Montero, Narayanan Narayanan, Laurent Rosaz, Johan Thapper, and Zsolt Tuza. Tropical dominating sets in vertex-coloured graphs. *Journal of Discrete Algorithms*, 48:27–41, 2018.
- [J11] Peter Jonsson and Johan Thapper. Tractability conditions for numeric CSPs. *Theoretical Computer Science*, 715:21–34, 2018.
- [J10] Johan Thapper and Stanislav Živný. The limits of SDP relaxations for general-valued CSPs. *ACM Transactions on Computation Theory*, 10(3):1–22, 2018.
- [J9] Johan Thapper and Stanislav Živný. The power of sherali-adams relaxations for general-valued CSPs. *SIAM Journal on Computing*, 46(4):1241–1279, 2017.
- [J8] Peter Jonsson and Johan Thapper. Constraint satisfaction and semilinear expansions of addition over the rationals and the reals. *Journal of Computer and System Sciences*, 82(5):912–928, 2016.
- [J7] Johan Thapper and Stanislav Živný. The Complexity of Finite-Valued CSPs. *Journal of the ACM*, 63(4):1–37, 2016.
- [J6] Robert Engström, Tommy Färnqvist, Peter Jonsson, and Johan Thapper. An approximability-related parameter on graphs - properties and applications. *Discrete Mathematics & Theoretical Computer Science*, 17(1):33–66, 2015.
- [J5] Vladimir Kolmogorov, Johan Thapper, and Stanislav Živný. The power of linear programming for general-valued CSPs. *SIAM Journal on Computing*, 44(1):1–36, 2015.
- [J4] Johan Thapper and Stanislav Živný. Necessary conditions for tractability of valued CSPs. *SIAM Journal on Discrete Mathematics*, 29(4):2361–2384, 2015.
- [J3] Manuel Bodirsky, M. Dugald Macpherson, and Johan Thapper. Constraint satisfaction tractability from semi-lattice operations on infinite sets. *ACM Transactions on Computational Logic*, 14(4), 2013.

[J2] Peter Jonsson and Johan Thapper. Approximating integer programs with positive right-hand sides. *Information Processing Letters*, 110(10):351–355, 2010.

[J1] Johan Thapper. Refined counting of fully packed loop configurations. *Séminaire Lotharingien de Combinatoire*, 56:B56e, 2006.

## Conference and workshop proceedings

[C16] Johan Thapper and Stanislav Živný. The limits of SDP relaxations for general-valued CSPs. In *Proceedings of the 32nd Annual ACM/IEEE Symposium on Logic in Computer Science (LICS-2017)*, pages 1–12, 2017.

[C15] Jean-Alexandre Anglès d’Auriac, Csilla Bujtás, Hakim El Maftouhi, Marek Karpinski, Yannis Manoussakis, Leandro Montero, Narayanan Narayanan, Laurent Rosaz, Johan Thapper, and Zsolt Tuza. Tropical dominating sets in vertex-coloured graphs. In *Proceedings of the 10th International Workshop on Algorithms and Computation (WALCOM-2016)*, pages 17–27, 2016.

[C14] Johan Thapper and Stanislav Živný. Sherali-Adams relaxations for valued CSPs. In *Proceedings of the 42nd International Colloquium on Automata, Languages, and Programming (ICALP-2015)*, pages 1058–1069, 2015.

[C13] Peter Jonsson and Johan Thapper. Affine consistency and the complexity of semilinear constraints. In *Proceedings of the 39th International Symposium on Mathematical Foundations of Computer Science (MFCS-2014)*, pages 420–431, 2014.

[C12] Johan Thapper and Stanislav Živný. The complexity of finite-valued CSPs. In *Proceedings of the 45th ACM Symposium on the Theory of Computing (STOC-2013)*, pages 695–704, 2013.

[C11] Johan Thapper and Stanislav Živný. The power of linear programming for valued CSPs. In *Proceedings of the 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS-2012)*, pages 669–678, 2012.

[C10] Peter Jonsson, Fredrik Kuivinen, and Johan Thapper. Min CSP on four elements. In *Proceedings of 17th International Conference on Principles and Practice of Constraint Programming (CP-2011)*, pages 438–453, 2011.

[C9] Robert Engström, Tommy Färnqvist, Peter Jonsson, and Johan Thapper. Properties of an approximability-related parameter on circular complete graphs. In *Proceedings of V Latin-American Algorithms, Graphs, and Optimization Symposium (LAGOS-2009)*, pages 115–120, 2009.

[C8] Tommy Färnqvist, Peter Jonsson, and Johan Thapper. Approximability distance in the space of  $H$ -colourability problems. In *Proceedings of the 4th International Computer Science Symposium in Russia (CSR-2009)*, pages 92–104, 2009.

[C7] Peter Jonsson and Johan Thapper. Approximability of the maximum solution problem for certain families of algebras. In *Proceedings of the 4th International Computer Science Symposium in Russia (CSR-2009)*, pages 215–226, 2009.

[C6] Peter Jonsson, Gustav Nordh, and Johan Thapper. The maximum solution problem on graphs. In *Proceedings of the 32nd International Symposium on Mathematical Foundations of Computer Science (MFCS-2007)*, pages 228–239, 2007.

- [C5] Ola Angelsmark and Johan Thapper. Partitioning based algorithms for some colouring problems. In *Recent Advances in Constraints, Joint ERCIM/CoLogNET International Workshop on Constraint Solving and Constraint Logic Programming*, volume 3978 of *Lecture Notes in Computer Science*, pages 44–58, 2006.
- [C4] Ola Angelsmark and Johan Thapper. Algorithms for the maximum hamming distance problem. In *Constraint Satisfaction and Constraint Logic Programming: ERCIM/CoLogNet International Workshop (CSCLP-2004), Revised Selected and Invited Papers*, volume 3419 of *Lecture Notes in Computer Science*, pages 128–141, 2005.
- [C3] Ola Angelsmark and Johan Thapper. A microstructure based approach to constraint satisfaction optimisation problems. In *Proceedings of the 18th International FLAIRS Conference*, 2005.
- [C2] Ola Angelsmark and Johan Thapper. New algorithms for the maximum hamming distance problem. In *Proceedings of the Joint Annual Workshop of ERCIM/CoLogNet on Constraint Solving and Constraint Logic Programming (CSCLP-2004)*, pages 271–285, 2004.
- [C1] Ola Angelsmark, Peter Jonsson, Svante Linusson, and Johan Thapper. Determining the number of solutions to binary CSP instances. In *Proceedings of the 8th International Conference on Principles and Practice of Constraint Programming (CP-2002)*, pages 327–340, 2002.

## French national conference and workshop proceedings

- [F3] Johan Thapper. Cohérences et dichotomies parmi des csp pondérés. In *Actes des Douzièmes Journées Francophones de Programmation par Contraintes (JFPC-2016)*, pages 5–6, 2016.
- [F2] Johan Thapper and Stanislav Živný. Linear programming and the complexity of finite-valued csps. In *Actes des Neuvièmes Journées Francophones de Programmation par Contraintes (JFPC-2013)*, pages 299–302, 2013.
- [F1] Johan Thapper. The complexity of valued constraint satisfaction problems in a nutshell. In *Actes des Huitièmes Journées Francophones de Programmation par Contraintes (JFPC-2012)*, pages 298–301, 2012.

## Technical reports

- [P1] Johan Thapper. Independence complexes of cylinders constructed from square and hexagonal grid graphs. Technical report, 2008. *CoRR*, abs/0812.1165. 38 pages.