

Curriculum Vitae

Ms. Nina Narodytska

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Research interests

Constraint programming, knowledge compilation, algorithm design, operations research and computational social choice.

Employment history

Jan 2011 – present. Researcher, Optimisation group, NICTA;

September–November 2010. Software Engineer Intern with Google, Australia.

September–October 2009. Research Intern with the Planning and Scheduling Team, ISTC-CNR, Rome, Italy

July–September 2009. Research Intern with Constraint Programming Research Lab, Microsoft Research, Cambridge, UK.

June,2005–June 2006. Research Intern with the Knowledge Representation and Reasoning program, NICTA and UNSW

June, 2001–Dec, 2004 Software Engineer, WestGate Software Security Inc., Kiev, Ukraine

Education

Aug, 2006–December, 2011. Ph.D. student at the School of Computer Science and Engineering, UNSW; holder of NICTA International Postgraduate Award and NICTA Research Project Award scholarships

Thesis: Reformulation of global constraints

Supervisor: Toby Walsh

Co-supervisors: George Katsirelos, Maurice Pagnucco

Sep, 2000 – June, 2002. M.Sc. diploma with honors in Computer Science, Institute for Applied System Analysis at the National Technical University of Ukraine "Kyiv Polytechnic Institute". Average mark: 5 out of 5.

Thesis: Application of parameter identification to cointegration analysis

Sep, 1996 – June, 2000. B.Sc. diploma with honors in Computer Science, Institute for Applied System Analysis at the National Technical University of Ukraine "Kyiv Polytechnic Institute". Average mark: 4.9 out of 5.

Thesis: Analysis of comparative statics of mathematical models of open economy with floating currency rate

Awarded scholarships

- **AAAI'11 outstanding paper award** for the 'Complexity of and Algorithms for Borda Manipulation' paper.
- IJCAI travel grant, IJCAI'11, Barcelona, Spain, 2011 (600 EU).
- First prize in the Digital Future category in UNSW Dean's Postgraduate Research Award (Faculty of Engineering)(\$500).
- Finalist in the Google Australia & New Zealand 2009 Anita Borg Memorial Scholarship.
- Google Global Community Scholarship to attend the Grace Hopper Celebration of Women in Computing Conference, Orlando, Florida, 2007 (out of 10 scholarships worldwide) (\$2400).
- CSE, UNSW travel grant, CP10, St Andrews, Scotland, 2010 (\$2000).
- CSE, UNSW travel grant, AAAI10, Atlanta, USA, 2010 (\$1000).
- AAAI travel grant, AAAI10, Atlanta, USA, 2010 (free registration).
- CSE, UNSW travel grant, CP09 , Lisbon, Portugal, 2009 (\$1000).
- NICTA International Postgraduate Award and NICTA Research Project Award scholarships, Extension, 2009-2010.
- IJCAI09 student grant, IJCAI09, Pasadena, USA, 2009(\$1400).
- CP09 Doctoral Consortium travel grant, CP09, Lisbon, Portugal, 2009 (accommodation, registration fee).
- CSE, UNSW travel grant, IJCAI09 , Pasadena, USA, 2009 (\$3000).
- CPAIOR09 travel grant, CPAIOR09, Pittsburgh, USA, 2009 (accommodation, registration fee).
- CSE, UNSW travel grant, CPAIOR09, Pittsburgh, USA, 2009 (\$1000).

- CSCLP08 travel grant, Annual ERCIM Workshop on Constraint Solving and Constraint Logic Programming, Rome, Italy, 2008 (accommodation, registration fee).
- ECAI08 travel grant, ECAI Workshop on Modeling and Solving Problems with Constraints, Patra, Greece, 2008 (accommodation, registration fee).
- A travel grant from Postgraduate Research Support Scheme in University of New South Wales, ECAI08, Patra, Greece, 2008.(\$1000)
- CP08 Doctoral Consortium travel grant, CP08, Sydney, Australia, 2008 (accommodation, registration fee).
- ICAPS07 Doctoral Consortium travel grant, ICAPS07, Providence, Rhode Island, 2007, (\$2200)
- CP07 Doctoral Consortium travel grant, CP07, Providence, Rhode Island, 2007, (accommodation, registration fee)
- NICTA International Postgraduate Award and NICTA Research Project Award scholarships, 2006-2009

Summer schools

12/06- 17/06 2011 First International SAT/SMT Solver Summer School 2011, Boston, US

30/06- 04/07 2008 Association for Constraint Programming Summer School, Modelling with Constraints: Theory and Practice, St Andrews, Scotland

Activities

Member of the AAAI

Member of the Artificial Intelligence Association of Ireland

Member of the Association for Constraint Programming

Member of the Comic Multi-site Research Group

Member of Women@NICTA Group

Member of GirlGeekSydney Group

PC member of CP'12, AAAI'12, CPAIOR'12, SymCon'11, ModRef'11, AAAI'11, IJCAI'11, the Recent Advances in Constraints 2009.

Reviewer for AustralasianAI'07, PRICAI'08, AISMA'08, CP'08, AAAI'08, CPAIOR'09, IJCAI'09, SAT'09, SoCS'09, SARA'09, CP'09, ICTAI'09, LPAR'10, SAT'10, AAAI'10, CP'10, ComSOC'10, LPAR'10 and AustralasianAI'10, SAT'11, CP'11, WSCAI'11, INFORMS Journal on Computing, STACS'12, Constraints, JFPC'12, ECAI'12, Journal of Heuristics, FAW-AAIM'12

Conferences organization

A co-chair of the SymCon'11 workshop, 2011

A volunteer at AAAI, 2010.

Served on the organizing committee of the CP/ICAPS/KR conferences in Sydney, 2008.

Teaching experience

- Lecturer (jointly with Toby Walsh): for "Boolean and Constraint Satisfiability" part of the "Knowledge Representation and Reasoning" course, University of New South Wales in 2011.
- Tutor for the "Algorithms and Programming Techniques" course, University of New South Wales in 2010.
- Tutor for the "Mathematical Modeling of Economical Process" course, National Technical University of Ukraine, Kyiv in 2004.
- Tutor for the "Statistical analysis and prediction of Economical Process" course, National Technical University of Ukraine, Kyiv in 2003.

Programming skills

Programming languages: C/C++, Java, Pascal, Visual Basic, SQL

Technical computing programming languages and environments: ILOG, Gecode, Mistral, MiniZinc, Matlab, Mathcad, Maple

Academic Referees

Professor Toby Walsh
University of New South Wales, NICTA
Email: Toby.Walsh@nicta.com.au

Journal Publications

1. George Katsirelos, Nina Narodytska, Pascal VanHentenryck, Toby Walsh, and Justin Yip. Breaking symmetries in matrix models: Complexity, completeness, and checkers. *Artificial Intelligence*, Submitted, 2011.
2. Jessica Davies, George Katsirelos, Nina Narodytska, Toby Walsh, and Lirong Xia. Complexity of and Algorithms for the Manipulation of Borda, Nanson and Baldwins Voting Rules. *Artificial Intelligence*, Submitted, 2011.
3. Lucas Bordeaux, George Katsirelos, Nina Narodytska, and Moshe Y. Vardi. The Complexity of Integer Bound Propagation. In *JAIR*, 40, pages 657-676, 2011.
4. George Katsirelos, Nina Narodytska, and Toby Walsh. The weighted grammar constraint In *Annals of Operations Research*, 184, pages 179-207, 2011
5. George Katsirelos, Nina Narodytska, and Toby Walsh. Combining symmetry breaking and global constraints In *Recent Advances in Constraints*, pages 84–98, Springer, 2009.
6. Nina Narodytska and Toby Walsh. Constraint and variable ordering heuristics for compiling configuration problems. *IEEE Intelligent Systems*, Jan/Feb:78–80, 2007.
7. Nina Narodytska and Vladimir Podladchikov. Methods for cointegration constant estimation under a priori indeterminism. *System Research and Information Technologies Journal (in Russian)*, (2):84–91, 2003.

Conference Publications

1. Ronald de Haan, Nina Narodytska and Toby Walsh. The RegularGcc Matrix Constraint. *CP-2012*, submitted.
2. George Katsirelos, Nina Narodytska and Toby Walsh. Exploiting disjoint cores in a hitting-set based MaxSat solver. *CP-2012*, submitted.
3. Nina Narodytska and Toby Walsh. An Adaptive Symmetry Breaking Heuristic *CP-2012*, submitted.
4. George Katsirelos, Nina Narodytska and Toby Walsh. The SeqBin Constraint Revisited. *CP-2012*, submitted.
5. Nina Narodytska and Toby Walsh. Beyond Lex Leader: Breaking Symmetry with Other Orderings *CP-2012*, submitted.
6. Nina Narodytska, Toby Walsh and Lirong Xia. Combining Voting Rules Together *ECAI-2012*, submitted.
7. Jessica Davies, Nina Narodytska and Toby Walsh. Eliminating the Weakest Link: Making Manipulation Intractable?. *Proceedings of AAI-2012*, accepted.

8. Jessica Davies, George Katsirelos, Nina Narodytska and Toby Walsh. Complexity of and Algorithms for Borda Manipulation **AAAI outstanding paper award**. *Proceedings of AAAI-2011*, San Francisco, US, 2011.
9. Nina Narodytska, Toby Walsh and Lirong Xia. Manipulation of Nanson's and Baldwin's Rules. *Proceedings of AAAI-2011*, San Francisco, US, 2011.
10. Michael Fellows, Tobias Friedrich, Danny Hermelin, Nina Narodytska and Frances Rosamond. Constraint Satisfaction Problems: Convexity Makes AllDifferent Constraints Tractable. *Proceedings of IJCAI 2011*, Barcelona, Spain, 2011.
11. Christian Bessiere, Nina Narodytska, Claude-Guy Quimper and Toby Walsh. The AllDifferent Constraint with Precedences. *Proceedings of CPAIOR 2011*, Berlin, Germany, 2011.
12. Jessica Davies, George Katsirelos, Nina Narodytska, and Toby Walsh. An Empirical Study of Borda Manipulation. *Third International Workshop on Computational Social Choice, ComSoc 2010*, Dusseldorf, Germany, 2010
13. Christian Bessiere, George Katsirelos, Nina Narodytska, Claude-Guy Quimper, Toby Walsh. Propagating Conjunctions of AllDifferent Constraints. *Proceedings of the Twenty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2010*, Atlanta, Georgia, USA, 2010
14. George Katsirelos, Nina Narodytska, Toby Walsh. On the Complexity and Completeness of Static Constraints for Breaking Row and Column Symmetry. In D. Cohen, editor, *Principles and Practice of Constraint Programming, 16th International Conference, CP 2010*, pages 305-320, St Andrews, Scotland, 2010. Springer.
15. Christian Bessiere, George Katsirelos, Nina Narodytska, Claude-Guy Quimper, Toby Walsh. Decompositions of the NValue constraint. In D. Cohen, editor, *Principles and Practice of Constraint Programming, 16th International Conference, CP 2010*, pages 114-128, St Andrews, Scotland, 2010. Springer.
16. George Katsirelos, Sebastian Maneth, Nina Narodytska, and Toby Walsh. Restricted Global Grammar constraints In Ian Gent, editor, *Principles and Practice of Constraint Programming, 15th International Conference, CP 2009*, pages 501-508, Lisbon, Portugal, 2009. Springer.
17. George Katsirelos, Nina Narodytska, and Toby Walsh. Reformulating Global Grammar Constraints In *Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems, 6th International Conference, CPAIOR 2009*, volume 5015, pages 132–147, Pittsburgh, PA, USA, 2009. Springer.
18. Christian Bessiere, George Katsirelos, Nina Narodytska, Toby Walsh Circuits complexity and Constraint Propagators In *13th the International Joint Conference on Artificial Intelligence (IJCAI09)*, pages 412–418, 2007.

19. Christian Bessiere, George Katsirelos, Nina Narodytska, Claude-Guy Quimper, Toby Walsh Decompositions of All Different, Global Cardinality and Related Constraints In *13th the International Joint Conference on Artificial Intelligence (IJCAI09)*, pages 419–424, 2007.
20. Michael Maher, Nina Narodytska, Claude-Guy Quimper, and Toby Walsh. Flow-based propagators for the sequence and related global constraints. In Peter J. Stuckey, editor, *Principles and Practice of Constraint Programming, 14th International Conference, CP 2008*, pages 159–174, Sydney, Australia, 2008. Springer.
21. George Katsirelos, Nina Narodytska, and Toby Walsh. The weighted cfg constraint. In *Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems, 5th International Conference, CPAIOR 2008*, volume 5015, pages 323–327, Paris, France, 2008. Springer.
22. Sebastian Brand, Nina Narodytska, Claude-Guy Quimper, Peter Stuckey, and Toby Walsh. Encodings of the sequence constraint. In Christian Bessiere, editor, *Proceedings of the 13th International Conference on Principles and Practice of Constraint Programming, CP 2007*, pages 210–224. Springer, 2007.
23. Nina Narodytska and Toby Walsh. Constraint and variable ordering heuristics for compiling configuration problems. In *12th the International Joint Conference on Artificial Intelligence (IJCAI07)*, pages 149–154, 2007.
24. Nina Narodytska and Vladimir Podladchikov. Application of parametric identification methods in cointegration analysis. In *the 8th International Conference on Automatic Control Systems*, volume 47, pages 8–14, Donetsk, 2002.

Workshop Publications

1. Nina Narodytska, and Toby Walsh. Dynamic versus Static Value Symmetry Breaking. In *Proc. of the 11th Int. Workshop on Symmetry and Constraint Satisfaction Problems*, Lisbon, Portugal, 2011.
2. George Katsirelos, Nina Narodytska, Claude-Guy Quimper, and Toby Walsh. Global Matrix Constraints. In *Proc. of the 10th Int. Workshop on Constraint Modelling and Reformulation*, Perugia, Italy, 2011.
3. George Katsirelos, Nina Narodytska, and Toby Walsh. Breaking Generator Symmetry. In *SymCon 2009 The 9th International Workshop on Symmetry and Constraint Satisfaction Problems*, Lisbon, Portugal, 2009.
4. Christian Bessiere, George Katsirelos, Nina Narodytska, Claude-Guy Quimper, Toby Walsh Decompositions of the NValue constraint In *Proceedings of the CP'09 Eighth International Workshop on Constraint Modelling and Reformulation*, Lisbon, Portugal, 2009.

5. George Katsirelos, Nina Narodytska, and Toby Walsh. Dynamic posting of static symmetry breaking constraints. In *SymCon 2008 The 8th International Workshop on Symmetry and Constraint Satisfaction Problems*, Sydney, Australia, 2008.
6. Michael Maher, Nina Narodytska, Claude-Guy Quimper, and Toby Walsh. Flow-based propagators for the sequence and related global constraints. In *ECAI Workshop on Modeling and Solving Problems with Constraints*, pages 54–62, Patra, Greece, 2008.
7. George Katsirelos, Nina Narodytska, and Toby Walsh. Combining symmetry breaking and global constraints. In *CSCLP 2008 Annual ERCIM Workshop on Constraint Solving and Constraint Logic Programming*, pages 323–327, Rome, Italy, 2008.
8. Nina Narodytska and Toby Walsh. Constraint and variable ordering heuristics for compiling configuration problems. In *Workshop on Configuration affiliated with the 17th European Conference on Artificial Intelligence (ECAI06)*, pages 2–7, 2006.
9. Nina Narodytska and Toby Walsh. Constraint and variable ordering heuristics for compiling configuration problems. In *11th ERCIM Workshop on Constraint Solving and Constraint Logic Programming Caparica (CSCLP06)*, 2006.

Other Publications

1. Sebastian Brand, Nina Narodytska, Claude-Guy Quimper, Peter Stuckey, and Toby Walsh. Encodings of the SEQUENCE constraint. Technical Report 010, 2007.
2. Nina Narodytska and Toby Walsh. The cyclic SEQUENCE constraint. In *Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS'07), Doctoral Programme 2007*, 2007.
3. Nina Narodytska and Toby Walsh. Encodings of the SEQUENCE constraint using the REGULAR constraint. In *Proceedings of the 13th International Conference on Principles and Practice of Constraint Programming, Doctoral Programme 2007*, 2007.
4. Nina Narodytska. Analysis of comparative statics of open economy mathematical models with floating currency rate (extended abstract). In *the Second Postgraduate Students Conference on System Analysis and Information Technologies (in Russian)*, pages 72–74, 2000.
5. Nina Narodytska. Study of degenerated case of Markovits problem for financial risk minimization in case of a given portfolio profitability (extended abstract). In *the First Postgraduate Students Conference on System Analysis and Information Technologies (in Russian)*, 1999.