

# Bernhard Bliem

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## Education

- since 2012 **PhD studies**, *TU Wien, Vienna, Austria*.  
Thesis: *Treewidth in Non-Ground Answer Set Solving and Alliance Problems in Graphs*  
(advisor: Prof. Stefan Woltran)  
Expected graduation: October 2017
- 2007–2013 **Bachelor's studies**, *University of Vienna, Philosophy*.  
Degree: Bachelor of Arts (with distinction)
- 2010–2012 **Master's studies**, *TU Wien, Computational Intelligence*.  
Thesis: *Decompose, Guess & Check: Declarative Problem Solving on Tree Decompositions*  
(advisors: Prof. Stefan Woltran and Prof. Reinhard Pichler)  
Degree: "Diplom-Ingenieur" (equivalent to a Master of Science; with distinction)
- 2007–2010 **Bachelor's studies**, *TU Wien, Software & Information Engineering*.  
Thesis: *Tree Edit Distance in Answer Set Programming* (advisor: Prof. Stefan Woltran)  
Degree: Bachelor of Science (with distinction)

## Academic Experience

- since 2012 **Research assistant**, *Database and Artificial Intelligence Group, TU Wien*.  
Involved in the following projects:
  - *Treating Hard Problems with Decomposition and Dynamic Programming* (since 2014)
  - *Extending the Answer Set Programming Paradigm to Decomposed Problem Solving* (2012–2014)Development of the software framework "D-FLAT" based on the master's thesis
- 2015 **Visiting researcher**, *Algorithmics and Complexity Theory Group, TU Berlin*.  
Research visit at Prof. Rolf Niedermeier's group for two months  
Work on parameterized complexity analysis of problems in computational social choice
- 2009–2012 **Teaching assistant**, *Database and Artificial Intelligence Group, TU Wien*.  
Involved in the following courses:
  - Complexity Theory
  - Data Modeling
  - Database Systems
  - Semistructured Data
- 2009 **Intern**, *Forschungszentrum Telekommunikation Wien, Project internship*.  
Development of a web application for visualizing and editing information in a distributed system for disseminating traffic data

## Awards and Scholarships

- 2013 Award of the city of Vienna for outstanding master's theses ("Diplomarbeitspreis der Stadt Wien")
- 2012 "Distinguished Young Alumnus" award of the Faculty of Informatics at TU Wien for outstanding master's theses
- 2012 Scholarship ("Förderungsstipendium") of TU Wien

- 2011 First place in the competition for heuristic solutions of the tool switching problem in the course “Heuristic Optimization” at TU Wien
- 2008–2011 Four scholarships (“Leistungsstipendium”) of TU Wien for outstanding achievements in the academic years from 2007/2008 to 2010/2011

## Talks Given at Conferences and Workshops

- 2017 **26th International Joint Conference on Artificial Intelligence (IJCAI)**, Melbourne, Australia.  
Paper presentation: *The Impact of Treewidth on ASP Grounding and Solving* (planned)
- 2016 **1st Workshop on Trends and Applications of Answer Set Programming (TAASP)**, Klagenfurt, Austria.  
Paper presentation: *Clique-Width and Directed Width Measures for Answer-Set Programming*
- 2016 **39th German Conference on Artificial Intelligence (KI)**, Klagenfurt, Austria.  
Paper presentation: *ASP for Anytime Dynamic Programming on Tree Decompositions* (Extended Abstract)
- 2016 **25th International Joint Conference on Artificial Intelligence (IJCAI)**, New York, USA.  
Paper presentation: *Complexity of Efficient and Envy-Free Resource Allocation: Few Agents, Resources, or Utility Levels*  
Paper presentation: *ASP for Anytime Dynamic Programming on Tree Decompositions*
- 2016 **AAAI-16 Workshop on Beyond NP**, Phoenix, AZ, USA.  
Paper presentation: *Subset Minimization in Dynamic Programming on Tree Decompositions*
- 2015 **41st International Workshop on Graph-Theoretic Concepts in Computer Science (WG)**, TU Munich, Germany.  
Paper presentation: *Complexity of Secure Sets*
- 2014 **14th European Conference on Logics in Artificial Intelligence (JELIA)**, Funchal, Portugal.  
Paper presentation: *The D-FLAT System for Dynamic Programming on Tree Decompositions*
- 2013 **3rd International Workshop on Graph Structures for Knowledge Representation and Reasoning (GKR)**, Beijing, China.  
Paper presentation: *Applicability of ASP-based Problem Solving on Tree Decompositions*

## Summer Schools

- 2015 Attended “Advanced Course on AI (ACAI)” in Lille, France
- 2014 Attended “School on Parameterized Algorithms and Complexity” in Będlewo, Poland

## Administrative Work

- 2014 Voluntary work at conferences and organization of the “Vienna Summer of Logic”
- 2012 Voluntary work at conferences and organization of the “Vienna Logic Weeks 2012”

## Reviewing

- International Conference on Algorithmic Decision Theory (ADT)
- International Conference on Artificial General Intelligence (AGI)
- Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP)
- European Conference on Artificial Intelligence (ECAI)
- Workshop on Grounding and Transformations for Theories with Variables (GTTV)
- International Conference on Agents and Artificial Intelligence (ICAART)
- International Conference on Computational Science (ICCS)
- International Conference on Logic Programming (ICLP)
- International Symposium on Artificial Intelligence and Mathematics (ISAIM)
- German Conference on Artificial Intelligence (KI)
- International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR)
- RCRA International Workshop on “Experimental evaluation of algorithms for solving problems with combinatorial explosion” (RCRA)

## Research Interests

- Artificial intelligence
  - Answer set programming
  - Propositional satisfiability
  - Constraint satisfaction
  - Knowledge representation & reasoning
  - Computational social choice
  - Logic programming
  - Functional programming
- Algorithms and complexity
  - (Parameterized) complexity analysis
  - Treewidth and other structural parameters
  - Problems in the polynomial hierarchy

## Selected Publications

- 2017 Bernhard Bliem, Marius Moldovan, Michael Morak, and Stefan Woltran.  
The impact of treewidth on ASP grounding and solving.  
In *Proc. 26th International Joint Conference on Artificial Intelligence (IJCAI 2017)*.  
AAAI Press, 2017.  
Accepted for publication.
- 2016 Bernhard Bliem and Stefan Woltran.  
Equivalence between answer-set programs under (partially) fixed input.  
In *Proc. 9th International Symposium on Foundations of Information and Knowledge Systems (FolKS 2016)*, volume 9616 of *LNCS*, pages 95–111. Springer, 2016.

Bernhard Bliem, Reinhard Pichler, and Stefan Woltran.  
Implementing Courcelle's Theorem in a declarative framework for dynamic programming.

*Journal of Logic and Computation*, 2016.

Bernhard Bliem, Sebastian Ordyniak, and Stefan Woltran.

Clique-width and directed width measures for answer-set programming.

In *Proc. 22nd European Conference on Artificial Intelligence (ECAI 2016)*, volume 285 of *FAIA*, pages 1105–1113. IOS Press, 2016.

Bernhard Bliem, Benjamin Kaufmann, Torsten Schaub, and Stefan Woltran.

ASP for anytime dynamic programming on tree decompositions.

In *Proc. 25th International Joint Conference on Artificial Intelligence (IJCAI 2016)*, pages 979–986. AAAI Press, 2016.

Bernhard Bliem, Markus Hecher, and Stefan Woltran.

On efficiently enumerating semi-stable extensions via dynamic programming on tree decompositions.

In Pietro Baroni, Thomas F. Gordon, Tatjana Scheffler, and Manfred Stede, editors, *Proc. of the 6th International Conference on Computational Models of Argument (COMMA 2016)*, volume 287 of *Frontiers in Artificial Intelligence and Applications*, pages 107–118. IOS Press, 2016.

Bernhard Bliem, Günther Charwat, Markus Hecher, and Stefan Woltran.

D-FLAT<sup>2</sup>: Subset minimization in dynamic programming on tree decompositions made easy.

*Fundamenta Informaticae*, 147(1):27–61, 2016.

Bernhard Bliem, Robert Bredereck, and Rolf Niedermeier.

Complexity of efficient and envy-free resource allocation: Few agents, resources, or utility levels.

In *Proc. 25th International Joint Conference on Artificial Intelligence (IJCAI 2016)*, pages 102–108. AAAI Press, 2016.

2015 Bernhard Bliem and Stefan Woltran.

Complexity of secure sets.

In *Proc. 41st International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2015)*, volume 9224 of *LNCS*, pages 64–77. Springer, 2015.

Michael Abseher, Bernhard Bliem, Günther Charwat, Frederico Dusberger, and Stefan Woltran.

Computing secure sets in graphs using answer set programming.

*Journal of Logic and Computation*, 2015.

2014 Michael Abseher, Bernhard Bliem, Günther Charwat, Frederico Dusberger, Markus Hecher, and Stefan Woltran.

The D-FLAT system for dynamic programming on tree decompositions.

In *Proc. 14th European Conference on Logics in Artificial Intelligence (JELIA 2014)*, volume 8761 of *LNCS*, pages 558–572. Springer, 2014.

- 2012 Bernhard Bliem, Michael Morak, and Stefan Woltran.  
D-FLAT: Declarative problem solving using tree decompositions and answer-set programming.  
*Theory and Practice of Logic Programming*, 12(4-5):445–464, 2012.