

Declarative Language and Artificial Intelligence Section  
Department of Computer Science  
KU Leuven



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## 1. Education

- **2011 – 2015.** PhD in Computer Science, KU Leuven, Belgium. Thesis: “Groundedness in logics with a fix-point semantics”. Advisers: Prof. Dr. Marc Denecker, Prof. Dr. Joost Vennekens, Prof. Dr. Jan Van den Bussche (UHasselt). Joint degree: doctor in engineering: computer science (KU Leuven) and doctor in science: informatics (UHasselt).  
★ **Summa Cum Laude** with the **congratulations of the examination board** (Only awarded in exceptional circumstances, at most 5% of the doctorates in engineering at KU Leuven).
- **2009 – 2011.** Master of Science in Mathematics, KU Leuven, Belgium (with Honours: **Summa Cum Laude**). Thesis “Unique factorisation in regular local rings”, supervised by Dr. Jan Schepers.
- **2006 – 2009.** Bachelor of Science in Mathematics, KU Leuven, Belgium (with Honours: **Summa Cum Laude**).

## 2. Employment

- **October 2024 – ...** Research professor (associate), Department of Computer Science, KU Leuven, Belgium.
- **October 2024 – ...** Guest professor, Department of Computer Science, Vrije Universiteit Brussel, Belgium.
- **October 2018 – September 2024** Assistant/Associate professor, Department of Computer Science, Vrije Universiteit Brussel, Belgium.
- **October 2018 – September 2019** Visiting professor, Department of Computer Science, KU Leuven, Belgium.
- **October 2016 – September 2019.** Postdoctoral Fellow of the Research Foundation – Flanders (FWO), Department of Computer Science, KU Leuven, Belgium. Supervisor: Prof. Dr. Marc Denecker.
- **September 2015 – August 2016.** Postdoctoral Researcher, Department of Computer Science, Aalto University, Finland. Supervisor: Dr. Tomi Janhunen.
- **June 2015 – August 2015.** Postdoctoral Researcher, Department of Computer Science, KU Leuven, Belgium. Supervisor: Prof. Dr. Marc Denecker.
- **September 2009 – September 2011.** Tutor in mathematics, physics and informatics, Self-employed as secondary activity.

## 3. Research Interests

- Artificial intelligence, in particular knowledge representation
- Solving technology: SAT solving, pseudo-boolean solving, constraint programming, answer set programming, logic programming, (mixed) integer programming; methodologies to unify them and methods to get correctness guarantees
- Unifying frameworks for knowledge representation languages: approximation fixpoint theory, justification frameworks
- Database theory and its relation to knowledge representation
- Logics: (extensions of) classical logic, causal logics, temporal logics

## 4. Awards and Prizes

- ★ 2024 SAT Competition: Main Track SAT: second place (14 participants)
- ★ 2023 SAT Competition: Honorary Medal (Second place with 2022 rules) (49 participants)
- ★ AAAI 2022 distinguished paper award (9 papers out of 9251 submissions)
- ★ IJCAI 2021 distinguished paper award (3 papers out of 4204 submissions)
- ★ 2019 Holy Grail Challenge: First place (2 participants)
- ★ 2016 QBFEval: Prenex CNF: Second place (24 participants)
- ★ 2016 SAT Competition: No Limits: First place (20 participants)
- ★ PhD obtained Summa Cum Laude with the congratulations of the examination board (At most 5% of the doctorates in engineering at KU Leuven).
- ★ 2013 SAT Competition: Core Solvers, Sequential, Hard-combinatorial SAT+UNSAT: First place (34 participants)
- ★ 2013 SAT Competition: Core Solvers, Sequential, Hard-combinatorial SAT: Third place (31 participants)

## 5. Skills

### Languages

- Dutch: mother tongue
- English: excellent (C1 certified)
- French: intermediate

### Programming Languages

- C++: good
- Experience in many other languages including Java, C#, PHP, Python, Prolog and Haskell; always willing to learn new languages.

## 6. Professional Activities

### Projects

- FWO Junior Research Project *ProToX: From Proofs to Explanations (and Back Again)*: PI (1/1/2025–31/12/2028) (budget: 566.500 EUR)
- ★ **ERC Consolidator Grant** *CertiFOX: Certified First-Order Model Expansion*: PI (1/10/2024–30/9/2029) (budget: 2M EUR)
- VUB Interdisciplinary Research Project *Bridging the gap between explainable AI and evidence-based medicine, a patient's and expert's perspective in inherited cardiac arrhythmias*: co-PI (1/7/2021–30/6/2023) (total budget: 220.000 EUR)
- FWO Junior Research Project *FRESCO: A Framework for Explainable Solving and Constraint Optimization*: supervisor-spokesperson (1/1/2021–31/12/2024) (total budget: 504.000 EUR; VUB budget: 255.000 EUR)
- FWO Senior Research Project *Approximation Fixpoint Theory as a General Algebraic Theory of Constructive Knowledge*: supervisor-spokesperson (1/1/2021–31/12/2024) (total budget: 690.250 EUR; VUB budget: 256.500 EUR)
- ICT-48 *Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization* (TAILOR): co-PI. (VUB budget ~ 107.000 EUR)
- Flanders AI Research Impulse Program: co-PI. (1/7/2019–1/1/2024) (~ 50.000 EUR per year for my team)

### Tutorials

- Tutorial series on *Combinatorial Solving with Provably Correct Results* (with Ciaran McCreesh and Jakob Nordström); tutorials delivered at
  - 28th International Conference on Principles and Practice of Constraint Programming (CP) (Haifa, Israel)

- MIAO Seminar (*University of Copenhagen, Denmark; Virtual*)
- 32nd International Joint Conference on Artificial Intelligence (IJCAI) (*Macao, S.A.R.*)
- 38th Annual AAAI Conference on Artificial Intelligence (AAAI 2024) (*Vancouver, Canada*)

### Invited Talks

- *Combinatorial Solving with Provably Correct Results: from SAT to MaxSAT (and Beyond?)*, Workshop on Trends and Applications of Answer Set Programming (TAASP) (TAASP), Klagenfurt, Austria, November 24, 2024.
- *Certified Static and Dynamic Symmetry Breaking*, Satisfiability: Theory, Practice, and Beyond Workshop, UC Berkeley, USA, April 20, 2023.
- *BreakID: Static symmetry breaking for ASP*, Potassco Seminar, University of Potsdam, Germany (virtual), February 8, 2023.
- *Combinatorial Solving with Provably Correct Results*, MIAO Seminar, University of Copenhagen, Denmark (virtual) (invited tutorial, joint with Ciaran McCreesh and Jakob Nordström), November 29, 2022.
- *On Symmetries and Certification*, Dagstuhl seminar on Theory and Practice of SAT and Combinatorial Solving, October 13, 2022.
- *Solving with Provably Correct Results: Beyond Satisfiability, and Towards Constraint Programming*, The 28th International Conference on Principles and Practice of Constraint Programming (invited tutorial, joint with Ciaran McCreesh and Jakob Nordström), August 2nd, 2022.
- *The IDP System: What and Why?*, Workshop on Constraint Modelling and Reformulation (ModRef), October 25th, 2021.
- *Step-Wise Explanations for Constraint Programs*, Beyond Satisfiability Workshop, Tuesday, April 20th, 2021, UC Berkeley.
- *Step-Wise Explanations for Constraint Satisfaction (and Optimization?)*, Workshop on Progress Towards the Holy Grail, September 7, 2020, Louvain La Neuve.
- *Introduction to Approximation Fixpoint Theory and its Applications*, University of Calabria (6 hour course; PhD lecturer), Italy, July 2019.
- *Approximation Fixpoint Theory and its Application to Knowledge Representation*, University of Leipzig, January 15, 2019, Leipzig.
- *Symmetry Exploitation for Combinatorial Problems*, KTH Royal Institute of Technology, November 6, 2017, Stockholm.
- *Research highlight on SAT-to-SAT and symmetry exploitation*, COIN SAB meeting, October 16, 2017, Espoo.
- *Propagators and Solvers for the Algebra of Modular Systems*, International Workshop on Logic and Search (Lash 2016), October 17, 2016, New York City.
- *Symmetry in SAT/ASP/CSP: Breaking the Right Symmetries*, Computational Logic Day 2015 (CL 2015), December 8, 2015, Espoo.
- *Lazy Model Expansion: Interleaving Grounding with Search*, International Workshop on Logic and Search (Lash 2014), July 18, 2014, Vienna.

### Research Visits

- **May 2024** Prof. Dr. Jakob Nordström, Copenhagen, Denmark. Goal: collaboration on pseudo-Boolean proof logging.
- **April 2024** Prof. Dr. Panagiotis Rondogiannis and Prof. Dr. Angelos Charalambidis, Athens, Greece. Goal: collaboration on higher-order logic programming.
- **July 2019** Prof. Dr. Ester Zumpano, University of Calabria, Rende, Italy. Goal: collaboration on active integrity constraints and view updating.
- **January 2019** Prof. Dr. Gerd Brewka, University of Leipzig, Germany. Goal: exchange ideas on Weighted Abstract Dialectical Frameworks.
- **June 2018** Prof. Dr. Stefan Woltran, TU Vienna, Austria. Goal: exchange ideas on Weighted Abstract Dialectical Frameworks.

- **November 2017** Prof. Dr. Jakob Nordström, KTH Royal Institute of Technology, Stockholm, Sweden. Goal: exchange ideas on symmetry in SAT, and techniques for pseudo-Boolean solving.
- **October 2017** Dr. Tomi Janhunen, Aalto University, Espoo, Finland. Goal: COIN-SAB presentation and collaboration on QBF solving with SAT-to-SAT and on lazy grounding in ASP.
- **January 2016** Prof. Dr. Eugenia Ternovska, Simon Fraser University, Vancouver, Canada. Goal: collaboration on extending the algebra of modular systems to modular solvers and propagators.
- **May 2013** Prof. Dr. Torsten Schaub, University of Potsdam, Potsdam, Germany. Goal: exchange of research ideas with respect to answer set solver development.

## Editor

- Guest editor of special issue S687 on answer set programming and other computing paradigms of *Annals of Mathematics and Artificial Intelligence (AMAI)*

## Organisation of Conferences/Workshops/Schools

- **PoS 2026:** Program Chair (*Pragmatics of SAT*)
- **ECAI 2023:** Tutorial Chair (*European Conference on Artificial Intelligence*)
- **ICLP 2023:** Chair of the Summer School on Logic Programming
- **XLoKR 2022, 2023, 2024:** Organizing Committee (*Workshop on Explainable Logic-Based Knowledge Representation*)
- **XLoKR 2021:** Program Chair (*Workshop on Explainable Logic-Based Knowledge Representation*)
- **ICLP 2020 & 2021:** (*International Conference on Logic Programming*)
  - Doctoral Consortium Chair
  - Chair of the Autumn School on Logic Programming
- **BNAIC 2019:** Program Chair (*31th Benelux Conference on Artificial Intelligence*)
- **ICLP 2019:** Sister Conferences and Journal Presentation Track Chair (*International Conference on Logic Programming*)
- **ASPOCP 2016 & 2017:** Program Chair (*Ninth and Tenth Workshop on Answer Set Programming and Other Computing Paradigms*)

## Service on Program Committees

- Conferences: IJCAI 2015, LPNMR 2015, AAAI 2016, IJCAI 2016, PADL 2017, AAAI 2017, LPNMR 2017, IJCAI 2017, AAAI 2018, IJCAI-ECAI 2018 (Distinguished PC member), KR 2018, LPNMR 2019, EPIA 2019, IJCAI 2019, ICLP 2019, BNAIC 2019, ECAI 2020 (Senior PC), IJCAI-PRICAI 2020 (Senior PC), EPIA 2020, KR 2020, BNAIC/BeneLearn 2020, JELIA 2021, KR 2021, EPIA 2021, BNAIC/BeneLearn 2021, IJCAI-ECAI 2022, KR 2022, BNAIC/BeneLearn 2022, KR 2023, ICLP 2023, IJCAI 2023, BNAIC/BeneLearn 2023, LPAR 2024, AAMAS 2024, ICLP 2024, SAT 2025, JELIA 2025
- Workshops: IULP 2015, TAASP 2016, GTTV 2017, PAoASP 2017, POS 2018, ASPOCP 2018, LaSh 2018, ASPOCP 2019, IULP 2019, GTTV 2019, XLoKR 2020, DAO-XAI 2021, XLoKR 2021, XLoKR 2022, Datalog 2.0 2024

## Refereeing

- Reviewing assignments for **Research Grant Agencies:** FWF (Austria), Ministry of Education, University and Research (Italy), VLAIO (Belgium)
- Jury member for the **PhD defenses** of Hakan Metin (12/2019; Sorbonne University), Bram Aerts (06/2020; KU Leuven), Matthias van der Hallen (07/2020; KU Leuven), Francesco Pacenza (03/2021; University of Calabria), Roxana Rădulescu (08/2021; Vrije Universiteit Brussel), Sam Mattheus (05/2022; Vrije Universiteit Brussel), Heba Aamer (02/2023; Universiteit Hasselt), Elena Mastria (04/2023; University of Calabria), Alexandre Renaux (10/2023; Université Libre de Bruxelles), Eugenio Bargiacchi (11/2023; Vrije Universiteit Brussel),

- **Journals:** Theory and Practice of Logic Programming, Annals of Mathematics and Artificial Intelligence, Mathematical Structures in Computer Science, Constraints, Autonomous Agents and Multi-Agent Systems, Artificial Intelligence, Transactions on Computational Logic, Journal of Artificial Intelligence Research, Journal of Automated Reasoning
- **Conferences:** LPNMR 2013, ICLP 2013, JELIA 2014, ICLP 2014, KR 2014, AAAI 2015, KR 2016, JELIA 2016, STACS 2022
- **Workshops:** INAP/WLP 2011, NMR 2014

## 7. Teaching

### Lecturer

- **2023 – ....** *Beginselen van Kennisrepresentatie en Redeneren (Principles of Knowledge Representation and Reasoning)* (Master’s course, 6 ECTS)
- **2023 – 2025.** *Kennisrepresentatie en Redeneren (Knowledge Representation and Reasoning)* (Bachelor’s course, 6 ECTS)
- **2019 – 2024.** *Discrete Modeling, Optimization, and Search* (Master’s course, 6 ECTS)
- **2021 – 2024.** *Theory of Computation* (Master’s course, 3 ECTS)
- **2021 – 2024.** *Wetenschappelijk Rekenen (Scientific Computing)* (Bachelor’s course, 3 ECTS)
- **2019 – 2024.** *Algoritmen en Datastructuren 2 (Algorithms and Datastructures 2)* (Bachelor’s course, 6 ECTS)
- **2019 – 2021.** *Fundamentals of Computer Science* (Master’s course, 3 ECTS)
- **2020 – 2021.** *Open Information Systems* (Master’s course, 3 ECTS)
- **2018 – 2021.** *Automaten en Berekenbaarheid (Automata and Computability)* (Bachelor’s course, 6 ECTS)
- **2016 – 2018.** *Gegevensbanken (Databases)* (Bachelor’s course; 6 ECTS – I was responsible for half of the course)
- **2015 – 2016.** *Discrete Models and Search* (Master’s course; 5 ECTS)

### Teaching Assistant

- **2016 – 2018.** *Advanced Programming Languages for Artificial Intelligence* (Master’s course). My responsibilities involved creating take-home projects.
- **2016 – 2017.** *Modelling of Complex Systems* (Master’s course). My responsibilities involved creating and grading take-home projects, and occasionally lecturing the course.
- **2011 – 2015.** *Modelling of Complex Systems* (Master’s course). My responsibilities involved teaching the exercise sessions, creating and grading take-home projects, and occasionally lecturing the course.

### Supervision of PhD Students

- *Daimy van Caudenberg*, ongoing
- *Carlos Canterro*, ongoing
- *Robbe Van den Eede*, ongoing
- *Dieter Vandesande*, ongoing
- *Berhan Oumer Adame*, ongoing
- *Simon Jaxy*, ongoing
- *Samuele Pollaci*, ongoing
- *Linde Vanbesien*, ongoing
- *Emilio Gamba* (May 2024): Step-Wise Explanations for Constraint Solving
- *Maxime Jakubowski* (May 2024): Shapes Constraint Language: Formalization, Expressiveness, and Provenance
- *Simon Marynissen* (January 2022): Advances in Justification Theory

### Supervision of Master Theses

- *Daimy Van Caudenberg*: SAT-Based Enumeration of Solutions to the Yang-Baxter Equation

- *Dieter Vandesande*: Proof Logging for Maximum Satisfiability
- *Deniz Alp Atun*: Multi-objective Repeated Games with Strategy-based Payoffs
- *Jens Claes*: Natural Language processing for Knowledge Representation
- *Neline Van Ginkel*: Oracles in IDP: An implementation for epistemic logic
- *Geert Heyman*: Event Extraction from Text and Translation to Event Calculus
- *Pieter Van Hertum*: Using Presburger Arithmetic to simplify FOBDDs
- *Andries Verreydt*: Dimensions and Units in IDP

### Supervision of Bachelor Projects

- *Mathias Van Stalle*: Pseudo-Boolean Proofs for MaxSAT Resolution
- *Daimy van Caudenberg*: Static Symmetry and Dominance Handling for pseudo-Boolean Optimization
- *Ben Bosmans*: A comparative study of constraint programming and reinforcement learning for solving the vehicle routing problem
- *Inas Ghailaini*: Een vergelijkende studie van constraint programming en reinforcement learning
- *Wolf De Wulf*: Pseudo-Boolean Solving for Answer Set Programming

### Teaching education

- **2018 – 2019**. ZAP Onderwijsprofessionaliseringstraject: Teaching education for (starting) professors.
- **2011 – 2012**. Assistentenvorming: Teaching education for starting teaching assistants.

## 8. (Co-)authored Software

- *ZebraTutor* An artificially intelligent agent that explains how to solve logic grid puzzles.
- *IDP3* A knowledge-base system for first-order logic that supports various forms of inference to enable declarative problem solving.
- *MinisatID* An extension of the popular SAT-solver Minisat with inductive definitions, aggregates and integer variables.
- *BreakID* A symmetry breaking tool for SAT and ASP.
- *so2grounder* A tool to translate second-order logic theories into specifications for the solver SAT-to-SAT.
- *SmsControl* A Windows phone 8/Windows 10 mobile app to control text-controlled devices.

## 9. Publications

### Journal Articles

- [J29] **The Possible Asylum** *B. Bogaerts*, The American Mathematical Monthly Volume 132 (2), p. 175–179, 2025.  
★ *Impact factor (latest: 2023): 0.4*
- [J28] **Preservation theorems for Tarski’s relation algebra** *B. Bogaerts, B. ten Cate, B. McLean and J. Van den Bussche*, Logical Methods in Computer Science Volume 20 (3), p. 20:1–20:17, 2024.  
★ *Impact factor (latest: 2023): 0.6*
- [J27] **The Stable Model Semantics for Higher-Order Logic Programming** *B. Bogaerts, A. Charalambidis, G. Chatziagapis, B. Kostopoulos, S. Pollaci and P. Rondogiannis*, Theory and Practice of Logic Programming 24(4), p. 737–754, 2024.  
★ *Impact factor (latest: 2023): 1.4*
- [J26] **Executable First-Order Queries in the Logic of Information Flows** *H. Aamer, B. Bogaerts, D. Surinx, E. Ternovska and J. Van den Bussche*, Logical Methods in Computer Science Volume 20(2), p. 6:1–6:41, 2024.  
★ *Impact factor (latest: 2023): 0.6*

- [J25] **Embedding Justification Theory in Approximation Fixpoint Theory** *S. Marynissen, B. Bogaerts and M. Denecker*, Artificial Intelligence Volume 331, p. 104112, 2024.  
★ *Impact factor (latest: 2023): 5.1*
- [J24] **Expressiveness of SHACL Features and Extensions for Full Equality and Disjointness Tests** *B. Bogaerts, M. Jakubowski and J. Van den Bussche*, Logical Methods in Computer Science Volume 20(1), p. 16:1–16:34, 2024.  
★ *Impact factor (latest: 2023): 0.6*
- [J23] **Distributed Subweb Specifications for Traversing the Web** *B. Bogaerts, B. Ketsman, Y. Zeboudj, H. Aamer, R. Taelman and R. Verborgh*, Theory and Practice of Logic Programming Volume 24 (2), p. 394–420, 2024.  
★ *Impact factor (latest: 2023): 1.4*
- [J22] **Non-Deterministic Approximation Fixpoint Theory and Its Application in Disjunctive Logic Programming** *J. Heyninck, O. Arieli and B. Bogaerts*, Artificial Intelligence Volume 331, p. 104110, 2024.  
★ *Impact factor (latest: 2023): 5.1*
- [J21] **Efficiently Explaining CSPs with Unsatisfiable Subset Optimization** *E. Gamba, B. Bogaerts and T. Guns*, Journal of Artificial Intelligence Research Volume 78, p. 709–746, 2023.  
★ *Impact factor (2023): 4.5*
- [J20] **Inputs, Outputs, and Composition in the Logic of Information Flows** *H. Aamer, B. Bogaerts, D. Surinx, E. Ternovska and J. Van den Bussche*, ACM Transactions on Computational Logic, Volume 24 number 4, 2023, p. 1–44.  
★ *Impact factor (2023): 0.7*
- [J19] **Certified Dominance and Symmetry Breaking for Combinatorial Optimisation** *B. Bogaerts, S. Gocht, C. McCreesh and J. Nordström*, Journal of Artificial Intelligence Research (Conference Award Track) Volume 77, p. 1539–1589, 2023.  
★ *Impact factor (2023): 4.5*
- [J18] **Non-deterministic approximation operators: ultimate operators, semi-equilibrium semantics and aggregates** *J. Heyninck and B. Bogaerts*, Theory and Practice of Logic Programming Volume 23 (4), p. 632–647, 2023.  
★ *Impact factor (2023): 1.4*
- [J17] **Interactive Model Expansion in an Observable Environment** *P. Carbonelle, B. Bogaerts, J. Vennekens and M. Denecker*, Theory and Practice of Logic Programming Volume 23 (4), p. 648–663, 2023.  
★ *Impact factor (2023): 1.4*
- [J16] **Patient-reported outcome measures on mental health and psychosocial factors in patients with Brugada syndrome** *S. Six, P. Theuns, P. Libin, A. Nowé, L. Pannone, B. Bogaerts, S. Jaxy, C. Olsen, G. Pappaert, I. Grau, J. Sieira, S. Van Dooren, E. Scheirlynck, J. Nekkebroeck, M. Mallefroy, C. de Asmundis and J. Bilsen*, Europace Volume 5 (9), p. 1–10, 2023.  
★ *Impact factor (2023): 7.9*
- [J15] **Computing Abductive Explanations** *L. Caroprese, E. Zumpano and B. Bogaerts*, IEEE Intelligent Systems Volume 37 (6) (Special Issue on Reasoning with Inconsistent, Incomplete, and Uncertain Knowledge), p. 18–26, 2022.  
★ *Impact factor (2022): 6.4*
- [J14] **On Nested Justification Systems** *S. Marynissen, B. Bogaerts, M. Denecker and J. Heyninck*, Theory and Practice of Logic Programming Volume 22 (5), p. 641–657, 2022.  
★ *Impact factor (2022): 1.4*

- [J13] **A framework for step-wise explaining how to solve constraint satisfaction problems** *B. Bogaerts, E. Gamba and T. Guns*, Artificial Intelligence Volume 300, p. 103550, 2021, (Special issue on Explainable Artificial Intelligence).  
★ *Impact factor (2021): 14.05*
- [J12] **Stratification in Approximation Fixpoint Theory and Its Application to Active Integrity Constraints** *B. Bogaerts and L. Cruz-Filipe*, ACM Transactions on Computational Logic Volume 20 (1), 2021, p. 1–19.  
★ *Impact factor (2021): 0.898*
- [J11] **Exploiting Game Theory for Analysing Justifications** *S. Marynissen, B. Bogaerts and M. Denecker*, Theory and Practice of Logic Programming Volume 20 (6), p. 880–894, 2020.  
★ *Impact factor (2020): 0.747*
- [J10] **Safe Inductions and Their Applications in Knowledge Representation** *B. Bogaerts, M. Denecker and J. Vennekens*, Artificial Intelligence Volume 259, p. 167–185, 2018.  
★ *Impact factor (2018): 4.483*
- [J9] **Fixpoint Semantics for Active Integrity Constraints** *B. Bogaerts and L. Cruz-Filipe*, Artificial Intelligence Volume 255, p. 43–70, 2018.  
★ *Impact factor (2018): 4.483*
- [J8] **On Well-Founded Set-Inductions and Locally Monotone Operators** *B. Bogaerts, J. Vennekens and M. Denecker*, ACM Transactions on Computational Logic Volume 17 Issue 4, p. 27:1–27:32, 2016.  
★ *Impact factor (2016): 0.961*
- [J7] **Bootstrapping Inference in the IDP Knowledge Base System** *B. Bogaerts, J. Jansen, B. De Cat, G. Janssens, M. Bruynooghe and M. Denecker*, New Generation Computing Volume 34, Number 3, p. 193–220, 2016.  
★ *Impact factor (2016): 0.657*
- [J6] **Stable-Unstable Semantics: Beyond NP with Normal Logic Programs** *B. Bogaerts, T. Janhunen and S. Tasharrofi*, Theory and Practice of Logic Programming Volume 16, Number 5-6, p. 570–586, 2016.  
★ *Impact factor (2016): 1.38*
- [J5] **On Local Domain Symmetry for Model Expansion** *J. Devriendt, B. Bogaerts, M. Bruynooghe and M. Denecker*, Theory and Practice of Logic Programming Volume 16, Number 5-6, p. 632–652, 2016.  
★ *Impact factor (2016): 1.38*
- [J4] **Predicate Logic as a Modeling Language: Modeling and Solving some Machine Learning and Data Mining Problems with IDP3** *M. Bruynooghe, H. Blockeel, B. Bogaerts, B. De Cat, S. De Pooter, J. Jansen, A. Labarre, J. Ramon, M. Denecker and S. Verwer*, Theory and Practice of Logic Programming Volume 15, Number 6, p. 783–817, 2015.  
★ *Impact factor (2015): 0.952*
- [J3] **Knowledge Compilation of Logic Programs Using Approximation Fixpoint Theory** *B. Bogaerts and G. Van den Broeck*, Theory and Practice of Logic Programming Volume 15, Number 4-5, p. 464–480, 2015.  
★ *Impact factor (2015): 0.952*
- [J2] **Grounded Fixpoints and Their Applications in Knowledge Representation** *B. Bogaerts, J. Vennekens and M. Denecker*, Artificial Intelligence Volume 224, p. 51–71, 2015.  
★ *Impact factor (2015): 3.333*
- [J1] **Simulating Dynamic Systems Using Linear Time Calculus Theories** *B. Bogaerts, J. Jansen, M. Bruynooghe, B. De Cat, J. Vennekens and M. Denecker*, Theory and Practice of Logic Programming Volume 14, Number 4-5, p. 477–492, 2014.  
★ *Impact factor (2014): 1.051*

## Articles in Books

- [B3] **Reasoning with First-Order Logic** *B. Bogaerts*, Demystifying Artificial Intelligence - Symbolic, Data-Driven, Statistical and Ethical AI, p. 107–147, 2024.
- [B2] **Approximation Fixpoint Theory in Coq – with an Application to Logic Programming** *B. Bogaerts and L. Cruz-Filipe*, Logics and Type Systems in Theory and Practice, p. 84–99, 2024.
- [B1] **Predicate Logic as a Modeling Language: The IDP System** *B. De Cat, B. Bogaerts, M. Bruynooghe, G. Janssens and M. Denecker*, Chapter in Declarative Logic Programming: Theory, Systems, and Applications, p. 279–323, 2018.

## Conference Articles

- [C47] **Incremental SAT-Based Enumeration of Solutions to the Yang-Baxter Equation** *D. Van Caudenberg, B. Bogaerts and L. Vendramin*, 31st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2025.  
★ *CORE ranking: A*
- [C46] **Certifying Pareto-Optimality in Multi-Objective Maximum Satisfiability** *C. Jabs, J. Berg, B. Bogaerts and M. Jarvisalo*, 31st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2025, (Accepted).  
★ *CORE ranking: A*
- [C45] **Exploiting Symmetries in MUS Computation** *I. Bleukx, H. Verhaeghe, B. Bogaerts and T. Guns*, Proceedings of AAAI, 2025, (Accepted).  
★ *Acceptance rate: 23%; Oral presentation: 5%; CORE ranking: A\**
- [C44] **A Category-Theoretic Perspective on Higher-Order Approximation Fixpoint Theory** *S. Pollaci, B. Kostopoulos, M. Denecker and B. Bogaerts*, Proceedings of Logic Programming and Non-monotonic Reasoning, p. 317–330, 2024.
- [C43] **Certifying Without Loss of Generality Reasoning in Solution-Improving Maximum Satisfiability** *J. Berg, B. Bogaerts, J. Nordström, A. Oertel, T. Paxian and D. Vandesande*, Proceedings of the 30th International Conference on Principles and Practice of Constraint Programming (CP), p. 4:1–4:28, 2024.  
★ *CORE ranking: A*
- [C42] **Postulates for provenance: Instance-based provenance for first-order logic** *B. Bogaerts, M. Jakubowski and J. Van den Bussche*, Proceedings of the ACM on Management of Data (PODS’24), Volume 2 (2), p. 95(1)–95(16), 2024.  
★ *CORE ranking: A\**
- [C41] **Using Symmetries to Lift Satisfiability Checking** *P. Carbonelle, G. Schenner, M. Bruynooghe, B. Bogaerts and M. Denecker*, Proceedings of the Thirty-Eighth Conference on Artificial Intelligence (AAAI), p. 7961–7968, 2024.  
★ *Acceptance rate: 24%; CORE ranking: A\**
- [C40] **Towards a Unifying View on Monotone Constructive Definitions** *L. Vanbesien, S. Pollaci, B. Bogaerts and M. Denecker*, International Symposium on Artificial Intelligence and Mathematics (ISAIM), Revised Selected Papers; LNCS Volume 14494, 2024.
- [C39] **Simplifying Step-wise Explanation Sequences** *I. Bleukx, J. Devriendt, E. Gamba, B. Bogaerts and T. Guns*, 29th International Conference on Principles and Practice of Constraint Programming (CP), p. 11:1–11:20, 2023.  
★ *Acceptance rate: 40%; CORE ranking: A*

- [C38] **Mathematical Foundations for Joining Only Knowing and Common Knowledge** *M. Cramer, S. Pollaci and B. Bogaerts*, 20th International Conference on Principles of Knowledge Representation and Reasoning (KR), p. 167–177, 2023.  
★ Acceptance rate: 23%; CORE ranking: A\*
- [C37] **Certified Core-Guided MaxSAT Solving** *J. Berg, B. Bogaerts, J. Nordström, A. Oertel and D. Vandesande*, Proceedings of the 29th International Conference on Automated Deduction (CADE), p. 1–22, 2023.  
★ Acceptance rate: 43%; CORE ranking: A
- [C36] **Symmetry and Dominance Breaking for Pseudo-Boolean Optimization** *D. Van Caudenberg and B. Bogaerts*, Artificial Intelligence and Machine Learning, p. 149–166, 2023.
- [C35] **SHACL: A Description Logic in Disguise** *B. Bogaerts, M. Jakubowski and J. Van den Bussche*, Proceedings of Logic Programming and Non-Monotonic Reasoning (LPNMR), p. 75–88, 2022.
- [C34] **QMaxSATpb: A Certified MaxSAT Solver** *D. Vandesande, W. De Wulf and B. Bogaerts*, Proceedings of Logic Programming and Non-Monotonic Reasoning (LPNMR), p. 429–442, 2022.
- [C33] **Tree-Like Justification Systems are Consistent** *S. Marynissen and B. Bogaerts*, Proceedings 38th International Conference on Logic Programming (ICLP), p. 1–11, 2022.  
★ CORE ranking: A
- [C32] **Certified Symmetry and Dominance Breaking for Combinatorial Optimisation** *B. Bogaerts, S. Gocht, C. McCreesh and J. Nordström*, Proceedings of the AAAI Conference on Artificial Intelligence, 36(4), p. 3698–3707, 2022.  
★ Acceptance rate: 15%; CORE ranking: A\*  
★ AAAI-22 Distinguished paper award ★
- [C31] **Expressiveness of SHACL features** *B. Bogaerts, M. Jakubowski and J. Van den Bussche*, 25th International Conference on Database Theory (ICDT 2022), p. 15:1–15:16, 2022.  
★ CORE ranking: A
- [C30] **SHACL: A Description Logic in Disguise** *B. Bogaerts, M. Jakubowski and J. Van den Bussche*, BNAIC/BeneLearn 2021, p. 271–284, 2021.
- [C29] **Fixpoint Semantics for Recursive SHACL** *B. Bogaerts and M. Jakubowski*, Proceedings of The 37th International Conference on Logic Programming (ICLP), p. 41–47, 2021.  
★ Core ranking: A
- [C28] **Link Traversal with Distributed Subweb Specifications** *B. Bogaerts, B. Ketsman, Y. Zeboudj, H. Aamer, R. Taelman and R. Verborgh*, Proceedings of RuleML+RR, p. 62–79, 2021.
- [C27] **On the Relation Between Approximation Fixpoint Theory and Justification Theory** *S. Marynissen, B. Bogaerts and M. Denecker*, 30th International Joint Conference on Artificial Intelligence (IJCAI), p. 1973–1980, 2021.  
★ Acceptance rate: 13.9%; CORE ranking: A\*  
★ IJCAI-21 Distinguished paper award ★
- [C26] **Efficiently Explaining CSPs with Unsatisfiable Subset Optimization** *E. Gamba, B. Bogaerts and T. Guns*, 30th International Joint Conference on Artificial Intelligence (IJCAI), p. 1381–1388, 2021.  
★ Acceptance rate: 13.9%; CORE ranking: A\*
- [C25] **Ip2pb: Translating Answer Set Programs into Pseudo-Boolean Theories** *W. De Wulf and B. Bogaerts*, Proceedings of The 36th International Conference on Logic Programming (ICLP), p. 206–219, 2020.  
★ CORE ranking: A

- [C24] **Inputs, Outputs, and Composition in the Logic of Information Flows** *H. Amer, B. Bogaerts, D. Surinx, E. Ternovska and J. Van den Bussche*, 17th International Conference on Principles of Knowledge Representation and Reasoning (KR), p. 2–11, 2020.  
★ *Acceptance rate: 34%; CORE ranking: A\**
- [C23] **Step-wise explanations of constraint satisfaction problems** *B. Bogaerts, E. Gamba, J. Claes and T. Guns*, 24th European Conference on Artificial Intelligence (ECAI), p. 640–647, 2020.  
★ *Acceptance rate: 26.8%; CORE ranking: A*
- [C22] **Executable first-order queries in the logic of information flows** *H. Amer, B. Bogaerts, D. Surinx, E. Ternovska and J. Van den Bussche*, 23th International Conference on Database Theory (ICDT), p. 4:1–4:14, 2020.  
★ *CORE ranking: A*
- [C21] **ZebraTutor: Explaining How to Solve Logic Grid Puzzles** *J. Claes, B. Bogaerts, R. Canoy, E. Gamba and T. Guns*, Proceedings of the 31st Benelux Conference on Artificial Intelligence (BNAIC), 2019.  
★ *Runner-up best demo award*
- [C20] **Explaining actual causation in terms of possible causal processes** *M. Denecker, B. Bogaerts and J. Vennekens*, Proceedings of the 16th European Conference on Logics in Artificial Intelligence (JELIA), p. 214–230, 2019.  
★ *CORE ranking: A*
- [C19] **Weighted abstract dialectical frameworks through the lens of approximation fixpoint theory** *B. Bogaerts*, Proceedings of the thirty-third AAAI conference on artificial intelligence (AAAI), p. 2686–2693, 2019.  
★ *Acceptance rate: 16.2%; CORE ranking: A\**
- [C18] **Exploiting Justifications for Lazy Grounding of Answer Set Programs** *B. Bogaerts and A. Weinzierl*, Proceedings of the 27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence (IJCAI-ECAI), p. 1737–1745, 2018.  
★ *Acceptance rate: 20.5%; CORE ranking: A\**
- [C17] **Symmetric explanation learning: Effective dynamic symmetry handling for SAT** *J. Devriendt, B. Bogaerts and M. Bruynooghe*, Theory and Applications of Satisfiability Testing - SAT 2017, Proceedings, p. 83–100, 2017.  
★ *Acceptance rate: 46.1%; CORE ranking: A*
- [C16] **Propagators and Solvers for the Algebra of Modular Systems** *B. Bogaerts, E. Ternovska and D. Mitchell*, Proceedings of the 21st International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR-21), p. 227–248, 2017.  
★ *CORE ranking: A*
- [C15] **Safe Inductions: An Algebraic Study** *B. Bogaerts, J. Vennekens and M. Denecker*, Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI), p. 859–865, 2017.  
★ *Acceptance rate: 25.9%; CORE ranking: A\**
- [C14] **Semantics for Active Integrity Constraints Using Approximation Fixpoint Theory** *B. Bogaerts and L. Cruz-Filipe*, Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI), p. 866–872, 2017.  
★ *Acceptance rate: 25.9%; CORE ranking: A\**
- [C13] **A Compositional Framework for Building Typed Higher-Order Logics** *I. Dasseville, M. van der Hallen, B. Bogaerts, G. Janssens and M. Denecker*, Technical communications of ICLP, p. 14.1–14.14, 2016.  
★ *CORE ranking: A*

- [C12] **Distributed Autoepistemic Logic and its Application to Access Control** *P. Van Hertum, M. Cramer, B. Bogaerts and M. Denecker*, Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence (IJCAI), p. 1286–1292, 2016.  
★ *Acceptance rate: 24%; CORE ranking: A\**
- [C11] **Relevance for SAT(ID)** *J. Jansen, B. Bogaerts, J. Devriendt, G. Janssens and M. Denecker*, Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence (IJCAI), p. 596–602, 2016.  
★ *Acceptance rate: 24%; CORE ranking: A\**
- [C10] **Improved Static Symmetry Breaking for SAT** *J. Devriendt, B. Bogaerts, M. Bruynooghe and M. Denecker*, Theory and Applications of Satisfiability Testing - SAT 2016, Proceedings, p. 104–122, 2016.  
★ *Acceptance rate: 44.3%; CORE ranking: A*
- [C9] **Declarative Solver Development: Case Studies** *B. Bogaerts, T. Janhunen and S. Tasharrofi*, Principles of Knowledge Representation and Reasoning: Proceedings (KR), p. 74–83, 2016.  
★ *Acceptance rate: 26.9%; CORE ranking: A\**
- [C8] **Partial Grounded Fixpoints** *B. Bogaerts, J. Vennekens and M. Denecker*, Proceedings of the twenty-fourth international conference on artificial intelligence (IJCAI), p. 2784–2790, 2015.  
★ *Acceptance rate: 28.8%; CORE ranking: A\**
- [C7] **Grounded Fixpoints** *B. Bogaerts, J. Vennekens and M. Denecker*, Proceedings of the twenty-ninth AAAI conference on artificial intelligence, p. 1453–1459, 2015.  
★ *Acceptance rate: 26.6%; CORE ranking: A\**
- [C6] **Inference in the FO(C) Modelling Language** *B. Bogaerts, J. Vennekens, M. Denecker and J. Van den Bussche*, European Conference on Artificial Intelligence (ECAI), p. 111–116, 2014.  
★ *Acceptance rate (long papers): 28%; CORE ranking: A*
- [C5] **FO(C): A Knowledge Representation Language of Causality** *B. Bogaerts, J. Vennekens, M. Denecker and J. Van den Bussche*, (ICLP’14 technical communication), Theory and Practice of Logic Programming Volume 14, Number (4-5)-Online-Supplement, p. 60–69, 2014.  
★ *CORE ranking: A*
- [C4] **The Effects of Buying a New Car: An Extension of the IDP Knowledge Base System** *P. Van Hertum, J. Vennekens, B. Bogaerts, J. Devriendt and M. Denecker*, (ICLP’13 technical communication), Theory and Practice of Logic Programming Volume 13, Number (4-5)-Online-Supplement, 2013.  
★ *CORE ranking: A*
- [C3] **Model Expansion in the Presence of Function Symbols Using Constraint Programming** *B. De Cat, B. Bogaerts, J. Devriendt and M. Denecker*, IEEE 25th International Conference on Tools with Artificial Intelligence, p. 1068–1075, 2013.  
★ *CORE ranking: B*
- [C2] **Modeling Machine Learning and Data Mining Problems with FO(.)** *H. Blockeel, B. Bogaerts, M. Bruynooghe, B. De Cat, S. De Pooter, M. Denecker, A. Labarre, J. Ramon and S. Verwer*, Technical Communications of the 28th International Conference on Logic Programming, ICLP 2012, p. 14–25, 2012.  
★ *CORE ranking: A*
- [C1] **Symmetry Propagation: Improved Dynamic Symmetry Breaking in SAT** *J. Devriendt, B. Bogaerts, C. Mears, B. De Cat and M. Denecker*, IEEE 24th International Conference on Tools with Artificial Intelligence, p. 49–56, 2012.  
★ *CORE ranking: B*

## Workshop Articles and Conference Abstracts

- [W19] **Static Symmetry and Dominance Breaking for Pseudo-Boolean Optimization** *D. Van Caudenberg and B. Bogaerts*, Proceedings of Benelux Conference on AI (BNAIC), 2022.  
★ *Selected for Post-Proceedings (24%)*
- [W18] **Efficiently Explaining CSPs with Unsatisfiable Subset Optimization (extended abstract)** *E. Gamba, B. Bogaerts and T. Guns*, The 21st workshop on Constraint Modelling and Reformulation (ModRef), 2022.
- [W17] **Formalising Approximation Fixpoint Theory (Extended Abstract)** *B. Bogaerts and L. Cruz-Filipe*, Days in Logic 2022, 2021.
- [W16] **Stepwise Explanations of Unsatisfiable Constraint Programs (Extended abstract)** *I. Bleukx, E. Gamba, B. Bogaerts and T. Guns*, The Third Workshop on Explainable Logic-Based Knowledge Representation (XLoKR), 2022.
- [W15] **A Formalisation of Approximation Fixpoint Theory** *B. Bogaerts and L. Cruz-Filipe*, TYPES 2021 - Book of Abstracts, p. 41–44, 2021.
- [W14] **Towards Lightweight Completion Formulas for Lazy Grounding in Answer Set Programming** *B. Bogaerts, S. Marynissen and A. Weinzierl*, Proceedings of the 18th International Workshop on Non-Monotonic Reasoning (NMR), p. 58–66, 2020.
- [W13] **Interactive Configuration Problems in Observable Environments** *P. Carbonelle, B. Bogaerts, J. Vennekens and M. Denecker*, 17th International Conference on Principles of Knowledge Representation and Reasoning (KR), 2020, (Poster presentation at KR).
- [W12] **Towards a Lower Bound Founded Fixpoint Semantics: Working Abstract** *B. Bogaerts, T. Schaub and S. Schellhorn*, Proceedings of Trends and Applications of Answer Set Programming (TAASP), 2019.
- [W11] **User-Oriented Solving and Explaining of Natural Language Logic Grid Puzzles** *J. Claes, B. Bogaerts, R. Canoy and T. Guns*, The Third Workshop on Progress Towards the Holy Grail, 2019.  
★ *CP19 holy grail workshop challenge winner*
- [W10] **Causal reasoning in a logic with possible causal process semantics** *M. Denecker, B. Bogaerts and J. Vennekens*, Proceedings of the 17th International Workshop on Non-Monotonic Reasoning (NMR), p. 90–98, 2018.
- [W9] **Consistency in Justification Theory** *S. Marynissen, N. Passchyn, B. Bogaerts and M. Denecker*, Proceedings of the 17th International Workshop on Non-Monotonic Reasoning (NMR), p. 41–52, 2018.
- [W8] **SAT-to-SAT in QBFEval 2016** *B. Bogaerts, T. Janhunnen and S. Tasharofi*, Proceedings of the 4th International Workshop on Quantified Boolean Formulas (QBF 2016), p. 63–70, 2016.
- [W7] **BreakID: Static Symmetry Breaking for ASP** *J. Devriendt and B. Bogaerts*, Proceedings of the ninth workshop on answer set programming and other computing paradigms, p. 25–39, 2016.
- [W6] **Implementing a Relevance Tracker Module** *J. Jansen, B. Bogaerts, J. Devriendt, G. Janssens and M. Denecker*, Proceedings of the ninth workshop on answer set programming and other computing paradigms, p. 77–91, 2016.
- [W5] **Solving QBF Instances With Nested SAT Solvers** *B. Bogaerts, T. Janhunnen and S. Tasharofi*, Proceedings of the first workshop on Beyond NP, p. 307–313, 2016.
- [W4] **Meta-level Representations in the IDP Knowledge Base System: Towards Bootstrapping Inference Engine Development** *B. Bogaerts, J. Jansen, B. De Cat, G. Janssens, M. Bruynooghe and M. Denecker*, Workshop on Logic and Search - LaSh, 2014.

- [W3] **BreakIDGlucose: On The Importance of Row Symmetry in SAT** *J. Devriendt, B. Bogaerts and M. Bruynooghe*, Fourth International Workshop on the Cross-Fertilization Between CSP and SAT (CSPSAT), 1-17, 2014.
- [W2] **FO(C) and Related Modelling Paradigms** *B. Bogaerts, J. Vennekens, M. Denecker and J. Van den Bussche*, 15th International Workshop on Non-Monotonic Reasoning, p. 90–96, 2014.
- [W1] **Analyzing Manuscript Traditions Using Constraint-Based Data Mining** *T. Andrews, H. Blockeel, B. Bogaerts, M. Bruynooghe, M. Denecker, S. De Pooter, C. Macé and J. Ramon*, First Workshop on Combining Constraint Solving with Mining and Learning, 2012.

### Thesis

- [T1] **Groundedness in Logics With a Fixpoint Semantics** *B. Bogaerts*, PhD thesis, 2015.

### Non-Refereed Publications

- [N4] **The Alpha Solver for Lazy-Grounding Answer-Set Programming** *A. Weinzierl, B. Bogaerts, J. Boman-son, T. Eiter, G. Friedrich, T. Janhunen, T. Kaminski, M. Langowski, L. Leutgeb, G. Schenner and R. Taupe*, ALP Newsletter, 2019.
- [N3] **Guest editorial: special issue on answer set programming and other computing paradigms** *B. Bogaerts, E. Erdem and A. Harrison*, Annals of Mathematics and Artificial Intelligence, p. 1–2, 2019.
- [N2] **Fixpoint Semantics for Active Integrity Constraints: Extended Abstract** *B. Bogaerts and L. Cruz-Filipe*, Proceedings of the 30th Benelux Conference on Artificial Intelligence (BNAIC), p. 31–32, 2018.
- [N1] **MiniSat(ID) for Satisfiability Checking and Constraint Solving** *B. De Cat, B. Bogaerts and M. Denecker*, ALP Newsletter, 2014.