Christoph Redl

Curriculum Vitae (02/2023)

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Personal Information

Date and Place of Birth
3rd of July, 1986 in St. Pölten, Austria

Nationality
Austrian

Languages
German (native), English (fluent)

Academic Degrees
Dr. techn. (≙ Ph.D.) in *Computer Science*
Dipl.-Ing. (≙ M.Sc.) in *Medical Informatics*
Dipl.-Ing. (≙ M.Sc.) in *Computational Intelligence*
B.Sc. in *Software and Information Engineering*

Current Position
Senior Lecturer and Researcher in the area of Artificial Intelligence

Current Affiliation
Department Computer Science, Artificial Intelligence & Data Analytics
University of Applied Sciences FH Technikum Wien, Vienna, Austria

Current Responsibilities
research, software development, reviewing, teaching (lectures, exercise lessons, theses), leading course development teams, administrative tasks

Research Interests
applications of AI (e.g. scheduling, planning, AI for computer games),
algorithms in AI, knowledge representation and reasoning, computational logic,
reasoner design, nonmonotonic logic programming and databases,
logic-oriented programming, answer set programming and extensions,
data-driven methods (e.g. deep (q-)learning), data science

Education

2010–2014
Ph.D. student of *Computer Science* at TU Vienna
Graduation with distinction as a Dr. techn. (≙ Ph.D.)

Program:	*Mathematical Logic in Computer Science*
Thesis:	*Answer Set Programming with External Sources: Algorithms and Efficient Evaluation*
Supervisor:	O. Univ.-Prof. Dipl.-Ing. Dr. techn. Thomas Eiter
Second supervisor:	Univ.-Prof. Dipl.-Ing. Dr. techn. Stefan Woltran

2009–2010
Master student of *Medical Informatics* at TU Vienna
Graduation with distinction as a Dipl.-Ing. (≙ M.Sc.)

Thesis:	*Merging of Biomedical Decision Diagrams*
Supervisor:	O. Univ.-Prof. Dipl.-Ing. Dr. techn. Thomas Eiter

2008–2010
Master student of *Computational Intelligence* at TU Vienna
Graduation with distinction as a Dipl.-Ing. (≙ M.Sc.)

Thesis:	*Development of a Belief Merging Framework for* DLVHEX
Supervisor:	O. Univ.-Prof. Dipl.-Ing. Dr. techn. Thomas Eiter

2005–2008
Bachelor student of *Software and Information Engineering* at TU Vienna
Graduation with distinction as a B.Sc.

Thesis:	*Very Large-Scale Neighborhood Search*
Supervisor:	Univ.-Ass. Dipl.-Ing. Dr. techn. Bin Hu

2000–2005
Technical upper secondary school in St. Pölten, Austria
Department of *Electronic Data Processing and Business Organization*
Graduation with distinction
Honored as the best student of the department of the year 2004/05

Thesis:	*Reengineering von Pre-.NET-Projekten auf die .NET-Plattform* (semi-automatic translation of Microsoft Access applications to Visual Basic .NET)
Supervisor:	Mag. Dr. Wilhelm Tröstler
Project:	*Development of a Change and Collaboration Management System in .NET* (using Visual Basic .NET and Active Server Pages .NET)
Project partner:	Microsoft Austria

1992–2000
Elementary and lower secondary school in Krems, Austria

Career History

August 2019–ongoing

Senior Lecturer and Researcher in the area of Artificial Intelligence
at University of Applied Sciences Technikum Wien
Department Computer Science, Artificial Intelligence & Data Analytics

Project participation:

2022–ongoing:	*Sustainable usage of data-driven AI technologies in the engergy sector* (FFG)
2020–2021:	*AI Applications in SMEs* (City of Vienna)
Responsibilities:	research, project proposals, software development (Java, Python, SQL, PL/SQL), teaching (theory and practical IT skills), supervision of theses and IT projects, advancement of curricula (head of the teams in the areas algorithms and data structures, formal foundations and artificial intelligence)

May 2015–August 2019

Assistant Professor (fixed-term)
at TU Vienna, Institute of Logic and Computation

Project participation:

2015–ongoing:	*Integrated Evaluation of Answer Set Programs and Extensions* (FWF P27730)
Responsibilities:	research, project proposals, software development (C++, Java, Python), experiments, benchmarking and data analysis (R), teaching (lectures, exercise lessons, supervision of theses), coordinating student assistants and tutors, IT administration, administrative tasks

July 2014–April 2015

Postdoctoral Researcher (FWF)
at TU Vienna, Institute of Information Systems

Project:	*Evaluation of ASP Programs with External Source Access* (FWF P24090)
Responsibilities:	research, software development (C++, Java, Python, AJAX), teaching (lectures, exercise lessons, supervision of theses)

November 2010–June 2014

Predoctoral Research Assistant (FWF)
at TU Vienna, Institute of Information Systems

Project 2013–2014:	*Evaluation of ASP Programs with External Source Access* (FWF P24090)
Project 2010–2012:	*Reasoning in Hybrid Knowledge Bases* (FWF P20840)

Responsibilities: research, software development (C++, Java), experiments, benchmarking and data analysis (R), teaching (exercise lessons, supervision of theses)

March 2007–June 2010

Tutor at various institutes of TU Vienna (see teaching experience)

Responsibilities: teaching (exercise lessons and exercise solution discussions)

July–August 2004

Internship at Cincinnati Extrusion GmbH, Vienna, Austria
Employed in the IT department
Responsibilities: development of a database application for the IT-administration, help-desk tasks, hardware assembling

July 2002

Internship at A. Porr AG, Vienna, Austria
Employed in the IT department
Responsibilities: extension of a database application for construction projects, Web development, office tasks

Reviewing and Committee Membership

Reviewing for Journals

- 2022: TPLP
- 2019: TPLP
- 2018: KI, NGCO, TPLP
- 2017: TPLP
- 2015: JAR, TPLP
- 2014: AIJ, SWJ

Reviewing as Program Committee Member

- 2020: AAAI, ASPOCP
- 2019: IJCAI, JELIA, LPNMR, TAASP
- 2018: AAAI, IJCAI-ECAI, TAASP
- 2017: AAAI, LPNMR, PAoASP
- 2016: AAAI
- 2015: LPNMR

Additional Reviewing as Subreviewer

- 2019: ICLP
- 2018: LPAR
- 2017: PADL
- 2016: ICLP, KR, ONTOLP
- 2015: LPAR
- 2014: ECAI, JELIA, PADL, RCRA, RuleML
- 2013: ICLP, LICS, LPAR, LPNMR
- 2012: ICAART, ICLP, IJCAR, NMR, RR

Organization Committee Membership

- Answer Set Programming Challenge 2019
  Co-located with LPNMR 2019, Philadelphia, Pennsylvania, USA
- Workshop on Trends and Applications of Answer Set Programming 2016
  Co-located with KI 2016, Klagenfurt, Austria
- Vienna Summer of Logic 2014
  Vienna, Austria
- Fourth Answer Set Programming Competition 2013
  Co-organized with the University of Calabria, Italy
- Vienna Logic Weeks 2012
  Vienna, Austria

Award Committee Membership

- 2019: VCLA Award Committee (selection of best bachelor and master theses)

Teaching Experience: Thesis Supervision

Supervised Theses at FH Technikum Wien

- Supervision of 28 bachelor theses in computer science (2020–2022)
- Supervision of 6 bachelor theses in business informatics (2020)
- Supervision of 6 master theses in business informatics (2019–2023)
- Supervision of 5 master thesis in computer graphics (2019–2022)
- Supervision of 7 master thesis in AI (2022–2023)

Supervised topics come mainly from the following fields:
artificial intelligence, algorithms, programming, software engineering, computer graphics;
to a low extend also from:
networks and security, software process models

Supervised Student Projects at FH Technikum Wien

- *Supervision of 53 software project*
  2019-2023
- *Supervision of 6 industry internships*
  2023

(Co-)Supervised Master Theses at TU Vienna

- *Evaluation of Epistemic Logic Programs*
  September 2016–August 2019
- *Development of a Build System for Cross-Platform Open-Source Projects*
  January 2015–January 2017
- *Integrating Constraint Programming into Answer Set Programming*
  November 2012–September 2013

(Co-)Supervised Bachelor Theses at TU Vienna

- *A Simulation Based Artificial Intelligence Agent for Angry Birds*
  March 2018–October 2019
- *Planning Student Group Appointments with HEX-Programs*
  February 2018–March 2019
- *HEX-Based Planning for an Artificial Intelligence Agent for Angry Birds*
  October 2017–November 2018
- *Modular Evaluation of Epistemic Logic Programs*
  July 2017–April 2019
- *aspguid: A Declarative GUI Specification Language for ASP Programs*
  March 2017–September 2017
- *Integrating Answer Set Programming with Object-oriented Languages*
  March 2016–November 2016
- *Inconsistency Analysis of Answer Set Programs*
  March 2016–September 2016

- *Evaluation Algorithms for Weak Constraints in HEX-Programs*
  August 2015–October 2016
- ACTHEX: *Implementing* HEX*-Programs with Action Atoms*
  July 2012–October 2012

(Co-)Supervised Student Projects at TU Vienna

- *Technical Writing in the Area of Logic-oriented Programming*
  June 2015–August 2015
- *Constraint Answer Set Programming Based on* HEX*-Programs*
  February 2015–June 2015
- *Theory Propagation in Constraint ASP*
  June 2014–August 2014
- *Integrating Constraint Programming into Answer Set Programming*
  November 2012–September 2013

Teaching Experience: Courses

Courses at FH Technikum Wien

Sole responsibility:

- *Scientific Working* (WS 19/20–WS 21/22)
- *Supervision of master theses* (WS 19/20–SS 23)
- *Supervision of bachelor theses* (SS 20–SS 23)

Joint as team leader:

- *Introduction to Artificial Intelligence* (WS 19/20–SS 23)
- *Knowledge Representation and Symbolic AI* (WS 21/22–WS 22/23)
- *Artificial Intelligence* (WS 21/22–WS 22/23)
- *Introduction to Artificial Intelligence (cont.ed.)* (WS 22/23)
- *Algorithms and Data Structures* (SS 21–SS23)
- *Formal Foundations of Computer Science* (SS 21–SS23)

Joint as team member:

- *Theoretical Computer Science* (WS 19/20)
- *Supervision of IT projects (several courses)* (WS 19/20–SS 23)
- *Object-oriented Programming and Modeling* (SS 20)
- *Medical Data Engineering* (SS 20)
- *Database Systems* (SS 20)
- *Scientific Working for Business Informatics* (WS 21/22–WS 22/23)
- *Functional Programming* (WS 22/23)

Courses at TU Vienna as Project Assistant and Assistant Professor

Sole responsibility:

- *Systems and Solving Techniques for Knowledge Representation and Reasoning* (WS 16/17–18/19)

Joint:

- *Knowledge-Based Systems for Business Informatics* (WS 14/15–17/18)
- *Introduction to Knowledge-Based Systems* (WS 15/16–18/19)
- *Knowledge-Based Systems* (SS 12, SS 15–19)
- *Introduction to Artificial Intelligence* (SS 12–19)
- *Declarative Problem Solving* (SS 15, SS 17, SS 18)
- *Project in Computer Science 1+2* (WS+SS 15–19)

Exercise Part of Courses at TU Vienna as Tutor

- *Logic-oriented Programming* (SS 10)
- *Introduction to Knowledge-Based Systems* (WS 09/10)

- *Distributed Systems* (WS 08/09–09/10)
- *Database Systems* (WS 08/09–09/10)
- *Data Modeling* (SS 09–10)
- *Algorithms and Data Structures* (SS 09–10)
- *Theoretical Computer Science and Logics* (SS 07–10)

Computer & IT Skills

Operating Systems (Software Development and Administration)
Linux systems, macOS, Microsoft Windows

Procedural and Object-Oriented Programming Languages
C, C++, Java (certified programmer), C#,
Visual Basic (6, VBA and .NET), Python, JavaScript, PHP, Perl,
Linux/Unix shell scripting

Libraries and Frameworks
clib, STL, Boost libraries, .NET Framework, ASP .NET,
Xamarin (cross-platform app development), WPF, Java Servlets

Declarative Languages and Knowledge Representation Formalisms
Datalog, answer set programming, HEX-programs, Prolog, XML,
multi-context systems, description logics, ontologies, Semantic Web,
Haskell, Lambda expressions

Data-driven AI, Machine Learning and Neural Networks
TensorFlow and Keras, scikit, NumPy, ML.NET, TensorFlow.NET,
Accord.NET, statistics system R

Text Processing
Microsoft Office, OpenOffice, LibreOffice, LaTeX, HTML, WML

Version Control Systems
Git, Subversion, CVS

Development Tools
GNU compiler collection, GNU build system (makefiles and autotools),
Valgrind (profiler), clang, Emscripten, Visual Studio, Eclipse, NetBeans,
Azure DevOps, Jupyter Notebooks

Relational Databases
SQL, PL/SQL, trigger, interfaces to procedural languages (e.g. JDBC),
MS SQL Server, Oracle Database, MySQL, PostgreSQL

Server Administration
experience in the administration of file, Web, SVN and benchmark servers (NFS,
Apache, HTCondor), with virtualization (VirtualBox) and with remote access (SSH)

Computergraphics & Gaming
OpenGL, DirectX (esp. Direct3D), XNA Framework, MonoGame,
shader programming (GLSL, HLSL, Cg), Unreal Engine, Blender

Compiler Construction

- strong background in formal languages
- experience in programming language design
- experience with parser and compiler generators (Lex, Yacc, Bison, Boost Spirit)

Software Engineering

- strong background in algorithms and data structures
  (e.g. algorithms on graphs, hard combinatorial problems)
- methods for efficient programming
- experience with software design patterns
- experience in test case design including unit tests (e.g. TestNG)
- experience in agile software development and test-driven development

Benchmarking

- experience in benchmarking, data analysis and presentation of the results
- HTCondor and Slurm load balancing system

Miscellaneous

- experience with e-learning platforms (e.g. Moodle)

Participation in Software Development Projects

GitHub profile: `https://github.com/credl`

2023–: pyRL
A reinforcement learning framework for Python.
Technologies: TensorFlow, Python

2023–: KITE
Development of industrial AI applications.
Technologies: logic-oriented programming, ontologies

2020–2021: AI-Bot for Space Shooter
Development of an AI-bot for a computer game based on reinforcement learning.
Technologies: C#, TensorFlow.NET, MonoGame

2020–2021: AIAV
Development of AI applications for small and medium enterprises.
Technologies: logic-oriented programming, ontologies

2019: ClingoApp
Port of the answer set solver *Clingo* to Android and iOS devices.
Technologies: C#, JavaScript, Xamarin, Emscripten

2015: Online Demo for Reasoner Software
Allows for using reasoner software via Web interfaces.
Technologies: AJAX, virtualized server

2015: mytheorem
A LaTeX package for flexible proof positioning.

2014–2019: ABC Benchmarking System
A system for automated benchmarking, formatting of the results in LaTeX, e-mail notifications, and statistical comparisons of several runs.
Technologies: HTCondor, shell and R scripts

2012–2019: AngryHEX
An AI agent for the *AngryBirds* computer game.
Technologies: Java, C++

2010–2019: DLVHEX
A reasoner for HEX-programs (an extension of answer set programs).
11 core team members (plus short-term members), lead developer 2012–2019
Technologies: C, C++, Python, Boost libraries, GNU tools

2009–2013: dsync
A utility for two-way synchronization of distributed directories.
Technologies: Java

2009–2011: Belief Merging System MELD
Allows for integration of multiple knowledge-bases.
Technologies: C++, Lex, Yacc, Boost Spirit

2009–2011: Decision Diagram Plugin for DLVHEX

Allows for easy processing of decision diagrams in logic programs. Implemented as plugin to the DLVHEX system and demonstrated with various medical applications.
Technologies: C++

2004–2005: Development of a Change and Collaboration Management System

A school project in cooperation with Microsoft Austria which serves as demonstration project for presenting the .NET technology in Microsoft talks.
Technologies: Visual Basic .NET, ADO .NET, Active Server Pages .NET

2004: Internship

Development of a database application for administrative tasks in the IT department as part of my internship at Cincinnati Extrusion GmbH.
Technologies: Visual Basic .NET, Microsoft Access

2002: Internship

Extension of custom database application for the management of construction projects as part of my internship at A. Porr AG.
Technologies: Visual Basic 6, Microsoft Access

Other Scientific and Teaching Activities

2019–ongoing: Team-Leadership
Lead of the teams for the following courses and topics within FH Technikum Wien:

- Introduction to Artificial Intelligence (bachelor)
- Formal Foundations of Computer Science (bachelor)
- Algorithms and Data Structures (bachelor)
- Artificial Intelligence (master)
- Knowledge Management (master)
- Knowledge Representation and Symbolic AI (master)

2019–ongoing: Examination Committees
Member resp. head of various examination committees
(bachelor and master exams, final attempt in course exams in front of committees)

2017–2018: Beginner's Day
Representation of the KBS group at the *Beginner's Day* for new students at TU Vienna

July 2017: Participant at the ASP Modeling Competition at LPNMR
Member of the *LIW* team
(Stefan Ellmauthaler, Christoph Redl, Peter Schüller)
Winner of the competition

July 2017: Invited Talk at IULP
Second International Workshop on User-Oriented Logic Paradigms (IULP 2017)
DLVHEX*: A User-Oriented Integration of Answer Set Programming with External Sources*

2014: Project Proposal
Significant participation in the preparation of the FWF project proposal:
Integrated Evaluation of Answer Set Programs and Extensions (FWF P27730)
Principal investigator: Thomas Eiter
Approved in November 2014, Grant: 349k Euro

2013–2019: Participant at Angry Birds AI competition
`http://www.aibirds.org`
Member of the *AngryHEX* team
(TU Vienna, University of Calabria, Max Planck Institute for Informatics)
Finalist of the 4th competition (July 29–31, 2015, Buenos Aires, Argentina)

February 2012: Research Visit
Research visit at the University of Potsdam, Germany
in the group of Prof. Dr. Torsten Schaub

2011: Project Proposal
Significant participation in the preparation of the FWF project proposal:
Evaluation of ASP Programs with External Source Access (FWF P24090)
Principal investigator: Thomas Eiter
Approved in October 2011, Grant: 336k Euro

Grants and Awards

July 2017
Winner of the ASP Modeling Competition at LPNMR
as member of the *LIW* team (Stefan Ellmauthaler, Christoph Redl, Peter Schüller)

December 2013
Best paper award
from the *National Workshop and Prize on Popularize Artificial Intelligence* for:

Francesco Calimeri, Michael Fink, Stefano Germano, Giovambattista Ianni, Christoph Redl, Anton Wimmer
AngryHEX: An Artificial Player for Angry Birds Based on Declarative Knowledge Bases

September 2012
Participation at the doctoral consortium at ICLP 2012
Honored with the best student presentation award

October 2010
Scholarship from the Vienna PhD School of Informatics

October 2009–July 2010
Research grant for my master theses funded by FWF and WWTF

2008, 2009, 2010, 2011
Merit scholarship for excellent academic achievements
from the Faculty of Informatics, TU Vienna

November 16, 2005
Technical upper secondary school in St. Pölten, Austria
Department of *Electronic Data Processing and Business Organization*
Honored as the best student of the department of the year 2004/05

Continuing Education

2019–2023
Various seminars on
didactics, e-learning, video editing,
university and privacy law (e.g. DSGVO)

March 2018
Seminar on gender and diversity management

June 2011
SAT/SMT summer school, Massachusetts Institute of Technology, USA

June 2008
Seminar on rhetoric and profiling (by Czak personal training)

April 2004
Certified Java Programmer

Journal Publications

[J10] Christoph Redl. Inlining external sources in answer set programs. *Theory and Practice of Logic Programming*, 19(3):360–411, 2019.

[J9] Thomas Eiter, Tobias Kaminski, Christoph Redl, and Antonius Weinzierl. Exploiting partial assignments for efficient evaluation of answer set programs with external source access. *Journal of Artificial Intelligence Research*, 62:665–727, 2018.

[J8] Thomas Eiter, Stefano Germano, Giovambattista Ianni, Tobias Kaminski, Christoph Redl, Peter Schüller, and Antonius Weinzierl. The DLVHEX system. *KI - Künstliche Intelligenz*, 32(2-3):187–189, August 2018.

[J7] Christoph Redl. The DLVHEX system for knowledge representation: Recent advances (system description). *Theory and Practice of Logic Programming*, 16(4-5):866–883, 2016.

[J6] Giovambattista Ianni, Francesco Calimeri, Stefano Germano, Andreas Humenberger, Christoph Redl, Daria Stepanova, Andrea Tucci, and Anton Wimmer. Angry-HEX: an artificial player for angry birds based on declarative knowledge bases. *IEEE Transactions on Computational Intelligence and AI in Games*, 8(2):128–139, 2016.

[J5] Thomas Eiter, Michael Fink, Giovambattista Ianni, Thomas Krennwallner, Christoph Redl, and Peter Schüller. A model building framework for answer set programming with external computations. *Theory and Practice of Logic Programming*, 16(4):418–464, 2016.

[J4] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Domain expansion for ASP-programs with external sources. *Artificial Intelligence*, 233:84–121, 2016.

[J3] Yi-Dong Shen, Kewen Wang, Jun Deng, Christoph Redl, Thomas Krennwallner, Thomas Eiter, and Michael Fink. FLP answer set semantics without circular justifications for general logic programs. *Artificial Intelligence*, 213:1–41, May 2014.

[J2] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Efficient HEX-program evaluation based on unfounded sets. *Journal of Artificial Intelligence Research*, 49:269–321, February 2014.

[J1] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Conflict-driven ASP solving with external sources. *Theory and Practice of Logic Programming*, 12(4–5):659–679, 2012.

Conference Publications

[C22] Dominik Dolezal, Florian Eckkrammer, Gerd Holweg, Sylvia Geyer, Robert Pucher, Christoph Redl, Benedik Salzbrunn, and Daniela Waller. Did COVID-19 improve our teaching? In *Proceedings of the International Conference of Education, Research and Innovation, Busan, South Korea, November 9-10, 2020*, 11 2020.

[C21] Christoph Redl. Conflict-driven ASP solving with external sources and program splits. In *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI 2017), August 19–25, 2017, Melbourne, Australia*, pages 1239–1246. AAAI Press, August 2017.

[C20] Thomas Eiter, Tobias Kaminski, Christoph Redl, Peter Schüller, and Antonius Weinzierl. Answer set programming with external source access. In *Reasoning Web. Semantic Interoperability on the Web - 13th International Summer School 2017, London, UK, July 7-11, 2017, Tutorial Lectures*, pages 204–275, 2017.

[C19] Christoph Redl. Explaining inconsistency in answer set programs and extensions. In *Proceedings of the Fourteenth International Conference on Logic Programming and Nonmonotonic Reasoning*, pages 176–190. Springer, July 2017.

[C18] Christoph Redl. Answer set programs with queries over subprograms. In *Proceedings of the Fourteenth International Conference on Logic Programming and Nonmonotonic Reasoning*, pages 160–175. Springer, July 2017.

[C17] Christoph Redl. On equivalence and inconsistency of answer set programs with external sources. In *Proceedings of the Thirty-First AAAI Conference (AAAI 2017), February 4–9, 2017, San Francisco, California, USA*, pages 1222–1228. AAAI Press, February 2017.

[C16] Christoph Redl. Efficient evaluation of answer set programs with external sources based on external source inlining. In *Proceedings of the Thirty-First AAAI Conference (AAAI 2017), February 4–9, 2017, San Francisco, California, USA*, pages 1229–1235. AAAI Press, February 2017.

[C15] Christoph Redl. Extending answer set programs with interpreted functions as first-class citizens. In Yuliya Lierler and Walid Taha, editors, *Proceedings of the Nineteenth International Symposium on Practical Aspects of Declarative Languages (PADL 2017), Paris, France, January 16-17, 2017*, LNCS, pages 68–85. Springer, January 2017.

[C14] Jakob Rath and Christoph Redl. Integrating answer set programming with procedural languages. In Yuliya Lierler and Walid Taha, editors, *Proceedings of the Nineteenth International Symposium on Practical Aspects of Declarative Languages (PADL 2017), Paris, France, January 16-17, 2017*, LNCS, pages 50–67. Springer, January 2017.

[C13] Thomas Eiter, Tobias Kaminski, Christoph Redl, and Antonius Weinzierl. Exploiting partial assignments for efficient evaluation of answer set programs with external source access. In *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence (IJCAI 2016), July 9–15, 2016, New York, New York, USA*. AAAI Press, July 2016.

[C12] Thomas Eiter, Christoph Redl, and Peter Schüller. Problem solving using the HEX family. In *Computational Models of Rationality*, pages 150–174. College Publications, 2016.

[C11] Thomas Eiter, Michael Fink, Christoph Redl, and Daria Stepanova. Exploiting support sets for answer set programs with external evaluations. In *Proceedings of the Twenty-Eighth AAAI Conference (AAAI 2014), July 27–31, 2014, Québec City, Québec, Canada*. AAAI Press, July 2014.

[C10] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. HEX-programs with existential quantification. In Ricardo Rocha, editor, *Proceedings of the Twentieth International Conference on Applications of Declarative Programming and Knowledge Management (INAP 2013), Kiel, Germany, September 11-13, 2013*, September 2014. Post proceedings.

[C9] Thomas Eiter, Thomas Krennwallner, and Christoph Redl. HEX-programs with nested program calls. In Hans Tompits, editor, *Proceedings of the Nineteenth International Conference on Applications of Declarative Programming and Knowledge Management (INAP 2011)*, volume 7773 of *LNAI*, pages 1–10. Springer, October 2013.

[C8] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. HEX-programs with existential quantification. In Ricardo Rocha, editor, *Proceedings of the Twentieth International Conference on Applications of Declarative Programming and Knowledge Management (INAP 2013), Kiel, Germany, September 11-13, 2013*, September 2013.

[C7] Michael Fink, Stefano Germano, Giovambattista Ianni, Christoph Redl, and Peter Schüller. ActHEX: implementing HEX programs with action atoms. In Pedro Cabalar and TranCao Son, editors, *Proceedings of the Twelfth International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2013)*, volume 8148 of *Lecture Notes in Computer Science*, pages 317–322. Springer Berlin Heidelberg, 2013.

[C6] Mario Alviano, Francesco Calimeri, Günther Charwat, Minh Dao-Tran, Carmine Dodaro, Giovambattista Ianni, Thomas Krennwallner, Martin Kronegger, Johannes Oetsch, Andreas Pfandler, Jörg Pührer, Christoph Redl, Francesco Ricca, Patrik Schneider, Martin Schwengerer, Lara Katharina Spendier, Johannes Peter Wallner, and Guohui Xiao. The fourth answer set programming competition: Preliminary report. In Pedro Cabalar and Tran Cao Son, editors, *Proceedings of the Twelfth International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2013), Corunna, Spain, September 15-19, 2013*, volume 8148 of *LNCS*, pages 42–53. Springer, September 2013.

[C5] Günther Charwat, Giovambattista Ianni, Thomas Krennwallner, Martin Kronegger, Andreas Pfandler, Christoph Redl, Martin Schwengerer, Lara Spendier, Johannes Peter Wallner, and Guohui Xiao. VCWC: a versioning competition workflow compiler. In Pedro Cabalar and Tran Cao Son, editors, *Proceedings of the Twelfth ernational Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2013), Corunna, Spain, September 15-19, 2013*, volume 8148 of *LNCS*, pages 233–238. Springer, September 2013.

[C4] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Liberal safety for answer set programs with external sources. In Marie desJardins and Michael Littman, editors, *Proceedings of the Twenty-Seventh AAAI Conference (AAAI 2013), July 14–18, 2013, Bellevue, Washington, USA*, pages 267–275. AAAI Press, July 2013.

[C3] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Exploiting unfounded sets for HEX-program evaluation. In *Proceedings of the Thirteenth European Conference on Logics in Artificial Intelligence (JELIA 2012), Toulouse, France, September 26-28, 2012*, September 2012.

[C2] Thomas Eiter, Thomas Krennwallner, and Christoph Redl. Nested HEX-programs. In Hans Tompits, editor, *Proceedings of the Nineteenth International Conference on Ap-*

plications of Declarative Programming and Knowledge Management (INAP 2011), Vienna, Austria, September 28–30, 2011, number arXiv:1108.5626v1 in arXiv. Computing Research Repository (CoRR), September 2011.

[C1] Christoph Redl, Thomas Eiter, and Thomas Krennwallner. Declarative belief set merging using merging plans. In Ricardo Rocha and John Launchbury, editors, *Proceedings of the Thirteenth International Symposium on Practical Aspects of Declarative Languages (PADL 2011), Austin, Texas, USA, January 24-25, 2011*, volume 6539 of *LNCS*, pages 99–114. Springer, January 2011.

Workshop Publications

[W6] Christoph Redl. Automated benchmarking of KR-systems. In *Proceedings of the Twnty-Third International Workshop on Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion, November 28, 2016, Genova, Italy*, November 2016.

[W5] Alessandro De Rosis, Thomas Eiter, Christoph Redl, and Francesco Ricca. Constraint answer set programming based on HEX-programs. In *Eighth Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2015), August 31, 2015, Cork, Ireland*, August 2015.

[W4] Francesco Calimeri, Michael Fink, Stefano Germano, Giovambattista Ianni, Christoph Redl, and Anton Wimmer. AngryHEX: an artificial player for angry birds based on declarative knowledge bases. In Matteo Baldoni, Federico Chesani, Paola Mello, and Marco Montali, editors, *National Workshop and Prize on Popularize Artificial Intelligence, Turin, Italy, December 5, 2013*, pages 29–35, December 2013.

[W3] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Grounding HEX-programs with expanding domains. In David Pearce, Shahab Tasharrofi, Evgenia Ternovska, and Concepción Vidal, editors, *Second Workshop on Grounding and Transformations for Theories with Variables (GTTV 2013), Corunna, Spain, September 15, 2013*, pages 3–15, September 2013.

[W2] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Eliminating unfounded set checking for HEX-programs. In Michael Fink and Yuliya Lierler, editors, *Fifth Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2012), September 4, 2012, Budapest, Hungary*, pages 83–97, September 2012.

[W1] Thomas Eiter, Thomas Krennwallner, and Christoph Redl. Declarative merging of and reasoning about decision diagrams. In Alessandro Dal Palù, Agostino Dovier, and Andrea Formisano, editors, *Workshop on Constraint Based Methods for Bioinformatics (WCB 2011), Perugia, Italy, September 12, 2011*, pages 3–15. Dipartimento di Matematica e Informatica, Universita degli Studi di Perugia, September 2011.

Doctoral Consortia

[D1] Christoph Redl. Answer set programming with external sources. In *Eighth ICLP Doctoral Consortium, Budapest, Hungary, September 4, 2012*, pages 469–475, 2012.

Poster Presentations

[P2] Francesco Calimeri, Michael Fink, Stefano Germano, Andreas Humenberger, Giovambattista Ianni, Christoph Redl, Daria Stepanova, and Andrea Tucci. AngryHEX: an angry birds-playing agent based on HEX-programs. Angry-Birds Competition 2014, August 20-22, 2014, Prague, Czech Republic, August 2014.

[P1] Francesco Calimeri, Michael Fink, Stefano Germano, Giovambattista Ianni, Christoph Redl, and Anton Wimmer. AngryHEX: an angry birds-playing agent based on HEX-programs. Angry-Birds Competition 2013, August 6-9, 2013, Beijing, China, August 2013.

Technical Reports

[R9] Christoph Redl. Inconsistency in answer set programs and extensions. Technical Report LOGCOMP RR-1923-18-04, Vienna University of Technology, Institute for Logic and Computation, June 2018.

[R8] Thomas Eiter, Tobias Kaminski, Christoph Redl, and Antonius Weinzierl. Exploiting partial assignments for efficient evaluation of answer set programs with external source access. Technical Report LOGCOMP RR-1923-18-02, Vienna University of Technology, Institute of Logic and Computation, January 2018.

[R7] Christoph Redl. Inlining external sources in answer set programs. Technical Report LOGCOMP RR-1923-18-01, Vienna University of Technology, Institute of Logic and Computation, January 2018.

[R6] Christoph Redl. The ABC benchmarking system - user manual. Technical Report INFSYS RR-1843-16-01, Vienna University of Technology, Institute for Information Systems, January 2016.

[R5] Thomas Eiter, Christoph Redl, and Peter Schüller. Problem solving using the HEX family. Technical Report INFSYS RR-1843-15-07, Institut für Informationssysteme, Technische Universität Wien, A-1040 Vienna, Austria, December 2015.

[R4] Thomas Eiter, Mustafa Mehuljic, Christoph Redl, and Peter Schüller. User guide: dlvhex 2.x. Technical Report INFSYS RR-1843-15-05, Vienna University of Technology, Institute for Information Systems, September 2015.

[R3] Thomas Eiter, Michael Fink, Giovambattista Ianni, Thomas Krennwallner, Christoph Redl, and Peter Schüller. A model building framework for answer set programming with external computations. Technical Report INFSYS RR-1843-15-01, Institut für Informationssysteme, Technische Universität Wien, A-1040 Vienna, Austria, January 2015.

[R2] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Domain expansion for ASP-programs with external sources. Technical Report INFSYS RR-1843-14-02, Institut für Informationssysteme, Technische Universität Wien, A-1040 Vienna, Austria, September 2014.

[R1] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Improving HEX-program evaluation based on unfounded sets. Technical Report INFSYS RR-1843-12-08, Institut für Informationssysteme, Technische Universität Wien, A-1040 Vienna, Austria, September 2013.

Theses

[T3] Christoph Redl. *Answer Set Programming with External Sources: Algorithms and Efficient Evaluation*. PhD thesis, Vienna University of Technology, Knowledge-Based Systems Group, A-1040 Vienna, Karlsplatz 13, April 2014.

[T2] Christoph Redl. Merging of biomedical decision diagrams. Master's thesis, Vienna University of Technology, Knowledge-Based Systems Group, A-1040 Vienna, Karlsplatz 13, October 2010.

[T1] Christoph Redl. Development of a belief merging framewerk for dlvhex. Master's thesis, Vienna University of Technology, Knowledge-based Systems Group, A-1040 Vienna, Karlsplatz 13, July 2010.

Scientific Talks

[S16] Christoph Redl. Conflict-driven ASP solving with external sources and program splits. In *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI 2017), August 19–25, 2017, Melbourne, Australia*, pages 1239–1246. AAAI Press, August 2017.

[S15] Christoph Redl. DLVHEX: A user-oriented integration of answer set programming with external sources. In *Second International Workshop on User-Oriented Logic Paradigms*. Springer, July 2017.

[S14] Christoph Redl. Explaining inconsistency in answer set programs and extensions. In *Proceedings of the Fourteenth International Conference on Logic Programming and Nonmonotonic Reasoning*, pages 176–190. Springer, July 2017.

[S13] Christoph Redl. Answer set programs with queries over subprograms. In *Proceedings of the Fourteenth International Conference on Logic Programming and Nonmonotonic Reasoning*, pages 160–175. Springer, July 2017.

[S12] Christoph Redl. Extending answer set programs with interpreted functions as first-class citizens. In Yuliya Lierler and Walid Taha, editors, *Proceedings of the Nineteenth International Symposium on Practical Aspects of Declarative Languages (PADL 2017), Paris, France, January 16-17, 2017*, LNCS, pages 68–85. Springer, January 2017.

[S11] Jakob Rath and Christoph Redl. Integrating answer set programming with procedural languages. In Yuliya Lierler and Walid Taha, editors, *Proceedings of the Nineteenth International Symposium on Practical Aspects of Declarative Languages (PADL 2017), Paris, France, January 16-17, 2017*, LNCS, pages 50–67. Springer, January 2017.

[S10] Christoph Redl. The DLVHEX system for knowledge representation: Recent advances (system description). In *Thirty-second International Conference on Logic Programming (ICLP 2016), New York City, NY, USA, October 16–21, 2016*, pages 866–883, 2016.

[S9] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. HEX-programs with existential quantification. In Ricardo Rocha, editor, *Twentieth International Conference on Applications of Declarative Programming and Knowledge Management (INAP 2013), Kiel, Germany, September 11-13, 2013*, September 2013.

[S8] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Liberal safety criteria for HEX-programs. In Marie desJardins and Michael Littman, editors, *Twenty-Seventh AAAI Conference (AAAI 2013), July 14–18, 2013, Bellevue, Washington, USA*, pages 267–275. AAAI Press, July 2013.

[S7] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Exploiting unfounded sets for HEX-program evaluation. In *Thirteenth European Conference on Logics in Artificial Intelligence, Toulouse, France, September 26-28, 2012*, September 2012.

[S6] Thomas Eiter, Michael Fink, Thomas Krennwallner, and Christoph Redl. Conflict-driven ASP solving with external sources. In *Eighth International Conference on Logic Programming (ICLP 2012), Budapest, Hungary, September 4–8, 2012*, pages 659–679, 2012.

[S5] Christoph Redl. Answer set programming with external sources. In *Eighth ICLP Doctoral Consortium, Budapest, Hungary, September 4, 2012*, pages 469–475, 2012.

[S4] Thomas Eiter, Michael Fink, Thomas Krennwallner, Christoph Redl, and Peter Schüller. Evaluation of ASP programs with external source access. In *University of Potsdam, Potsdam, Germany, February 1, 2012*.

[S3] Thomas Eiter, Thomas Krennwallner, and Christoph Redl. Nested HEX-programs. In Hans Tompits, editor, *Nineteenth International Conference on Applications of Declarative Programming and Knowledge Management (INAP 2011), Vienna, Austria, September 28–30, 2011*, number arXiv:1108.5626v1 in arXiv. Computing Research Repository (CoRR), September 2011.

[S2] Thomas Eiter, Thomas Krennwallner, and Christoph Redl. Declarative merging of and reasoning about decision diagrams. In Alessandro Dal Palù, Agostino Dovier, and Andrea Formisano, editors, *Workshop on Constraint Based Methods for Bioinformatics (WCB 2011), Perugia, Italy, September 12, 2011*, pages 3–15. Dipartimento di Matematica e Informatica, Universita degli Studi di Perugia, September 2011.

[S1] Christoph Redl, Thomas Eiter, and Thomas Krennwallner. Declarative belief set merging using merging plans. In Ricardo Rocha and John Launchbury, editors, *Thirteenth International Symposium on Practical ASPects of Declarative Languages (PADL 2011), Austin, Texas, USA, January 24-25, 2011*, volume 6539 of *LNCS*, pages 99–114. Springer, January 2011.