Stefan Ellmauthaler

Curriculum Vitae

Personal Data

Degrees	Dr. rer. nat., Dipl.-Ing. (comparable to MSc), BSc
Date of birth	May 9, 1986
Place of birth	Vienna
Citizenship	Austrian citizen

Education

10/2012 – 06/2018 **Doctoral study (Doctor rerum naturalium)** of Computer Science at the Leipzig University with predicate "magna cum laude"

Dissertation

Multi-Context Reasoning in Continuous Data-Flow Environments

Prof. Dr. Gerhard Brewka (supervisor, 1st reviewer)

Prof. Dr. Torsten Schaub (2nd reviewer)

10/2009 – 09/2012 **Master's study (Dipl.-Ing.)**, *"Computational Intelligence"*, Vienna University of Technology, with distinction.

Master's thesis

Abstract Dialectical Frameworks: Properties, Complexity, and Implementation

Privatdoz. Dr.techn. Dipl.-Ing. Stefan Woltran (supervisor)

Proj.Ass. Dipl.-Ing. Johannes Peter Wallner, BSc (assistance)

10/2005 – 07/2009 **Bachelor's study (BSc)**, *"Medicine and Computer Science"*, Vienna University of Technology.

09/2000 – 06/2005 **"Matura" Certificate (Higher School Certificate)**, *HTBLuVA Wiener Neustadt*, Department "EDVO".

School to gain the matriculation standard in conjunction with expertise in the field of informatics and business management (graduation at the 13th school year)

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Further Education

05/2022   **Leadership Skills for Postdocs**, *Graduate Academy TU Dresden*.
Workshop of 18 working units, Lecturer: Hiu Pun Chong

01/2022   **Agile Projectmanagement - Methods and Processes to Cooperation in Teams**, *Center for continuing education - TU Dresden*.
Workshop of 16 working units, Lecturer: Roberto Riehle (Scrum-Master and Agile-Coach)

10/2018 – 06/2020   **Saxon Higher Education Didactics Certificate**, *Center for Didactics and Higher Education Saxony (HDS)*, 240 working units.

07/2014   **Doctoral Consortium**, *Fourteenth Conference on Principles of Knowledge Representation and Reasoning (KR) 2014*, Vienna.
Topic: Argumentation for Reactive Reasoning

06/2013   **Summer school**, *Advanced Course on AI (ACAI) 2013*, London.

Employment History

01/2021 – today   **Research associate**, *TU Dresden*, Faculty of Computer Science / Center for Advancing Electronics Dresden (cfaed), International Center for Computational Logic (ICCL), Knowledge-Based Systems Group.
Research on qualitative ai, rule-based reasoning, ontology based data access, and argumentation theory. Software development in rust, system administration, various organisational tasks.

10/2018 – 12/2020   **Research associate**, *Leipzig University*, Computer Science Institute, Intelligent Systems Group.

10/2012 – 09/2018   **Research associate**, *Leipzig University*, Computer Science Institute, Intelligent Systems Group.

03/2011   **Project employee**, *Vienna University of Technology*.

Awards

07/2017 7th **Answer Set Programming Competition Modelling Competition**, *International Conference on Logic Programming and Nonmonotonic Reasoning (LPNR 2017)*, Espoo, Finland, 1st Place.

07/2014   **ASP Modelling Contest**, *International Conference on Logic Programming (ICLP) 2014 during the Vienna Summer of Logic 2014 Olympics*, Vienna, Austria, 3rd Place.

08/2013 20th **PROLOG Programming Contest**, *International Conference on Logic Programming (ICLP) 2013*, Istanbul, Turkey, 1st Place.

Academic Working Experience

01/2021 – today   **Research associate**.
employed at ScaDS.AI (Center for Scalable Data Analytics and Artificial Intelligence)

10/2018 – 12/2020   **Research associate**.
State-funded position with obligatory teaching duties

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10/2017 – 09/2018	**Research associate**.
	employed at the German Research Group (DFG) Project BR-$1817/7 - 2$ "*New tools for graph-based formal argumentation*"
10/2015 – 09/2017	**Research associate and administrative officer for Leipzig**.
	employed at the "*Hybirs-A2: Advanced Solving Technology for Dynamic and Reactive Applications*" project of the German Research Group (DFG) at the Research Unit "*Hybrid Reasoning for Intelligent Systems*" (FOR 1513)
10/2012 – 09/2015	**Research associate and administrative officer for Leipzig**.
	employed at the projects
	○ Hybris-A2: Advanced Solving Technology for Dynamic and Reactive Applications
	○ Hybris-B2: From Correlation to Causality: Hybrid Reasoning Over Dynamic Protein Interaction Networks
	of the German Research Group (DFG) at the Research Unit "*Hybrid Reasoning for Intelligent Systems*" (FOR 1513)

Reviewing

Journal Reviewing	Artificial Intelligence Review (AIRE), IfCoLog Journal of Logics and their Applications, Journal of Artificial Intelligence Research (JAIR), International Journal of Approximate Reasoning (IJA)
Program Committee	SAFA 2022, ASPOCP 2022, COMMA 2020, SAFA 2020, ASPOCP 2020, ASPOCP 2019, AAAI 2018, SAFA 2018, COMMA 2016, SAFA 2016, IJCAI 2015 (KR Track)
Reviewing Conferences & Workshops	COMMA 2018, IJCAI 2018,IJCAI 2017, IJCAI 2016, ICLP 2016, SAFA 2016, IJCAI 2015, IULP 2015, AAAI 2014, ECAI 2014, ReactKnow 2014, ICCSW 2014, ICLP 2013, ICCSW 2013

Professional Activities

Tutorial on Multi-Context Stream Reasoning at the 43rd *German Conference on Artificial Intelligence*

Guest editor of the *Theory and Practice in Logic Programming (TPLP)* special issue on *User-Oriented Logic Programming and Reasoning Paradigms*

Organiser of the 2nd *International Workshop on User-Oriented Logic Paradigms (IULP 2017)*, co-located with the 14th *International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2017)* at Espoo, Finland

Organiser of the *International Workshop on User-Oriented Logic Programming (IULP 2015)*, co-located with the *International Conference on Logic Programming (ICLP 2015)* at Cork, Ireland

Organiser of the *International Workshop on Reactive Concepts in Knowledge Representation (ReactKnow 2014)*, co-located with the *European Conference on Artificial Intelligence (ECAI 2014)* at Prague, Czech

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Teaching experience

Teaching responsibilities

WT 2021, ST 2022 Transfer of teaching responsibilities on knowledge based systems at TU Dresden

Lectures/Courses

WT 2021 **Rule-Based Paradigms in Knowledge Representation**, *Seminar*, 2.0h per week, winter term.
Advanced MSc module course in computer science

ST 2015 – 2020 **Knowledge Based Systems**, *Exercise*, 1.0h per week, summer term.
BSc course for computer science students; lecture (2.0h per week) held by G. Brewka

ST 2015 – 2020 **Knowledge Based Systems**, *Lecture*, 2.0h per week, summer term, represented G. Brewka at Topic "ASP".
BSc course for computer science students

WT 2019 **Knowledge Representation**, *Seminar*, 2.0h per week, winter term.
MSc course for computer science students

WT 2019 **Knowledge Representation**, *Lecture*, 2.0h per week, winter term, presented Multi-Context Systems.
MSc course for computer science students

WT 2017 – 2020 **Knowledge Representation**, *Practical Course*, 2.0h per week, winter term.
MSc course for computer science students

WT 2014 **Intelligent Systems**, *Seminar*, 2.0h per week, winter term.
MSc course for computer science students

ST 2014 **Logic in Computer Science**, *Seminar*, 2.0h per week, summer term.
MSc course for computer science students

WT 2013 **Knowledge Representation**, *Seminar*, 2.0h per week, winter term.
MSc course for computer science students

ST 2013 **Semantic Web Technologies**, *Seminar*, 2.0h per week, summer term.
MSc course for computer science students

Co-supervised bachelor's thesis at Leipzig University

2020 Tobias Krawetzke: *Dialectical Models Encoding in C++ neu betrachtet: Analyse, Benutzbarkeit und Modifikation*, "good" grade

2017 Kevin Kubsch: *Application and Implementation of splitting procedures to Abstract Dialectical Frameworks* "very good" grade

2014 Jakob Runge: *CARBON - a Web application and a RESTful API for argumentation*

Teaching Assistance

2006-2009 **Tutor**, *Vienna University of Technology, Institute of Computer Aided Automation*.
Tutor for the bachelor's course "*EProg*" (Introduction to Programming)

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Skills

Expert Competencies

- Knowledge Representation
- Argumentation Theory
- Declarative Programming (Answer Set Programming)
- LaTeX
- Scientific working methods
- Qualitative AI
- Complexity Theory
- Discrete Planning and Optimisation
- Higher Education Teaching
- Research organisation

Further Competencies

- (agile) Projectmanagement
- Python
- SQL, Datalog
- Basic Machine Learning (BDT, Deep Learning) knowledge
- Bash/Zsh
- C(++), Rust
- Git
- Basic Data Science knowledge

Used Tools/Libraries/Frameworks

Answer Set Programming	gringo, clasp, clingo
Teaching	Moodle, Opal, Ilias, Olat
Data Science	Jupyter, Google Colab, Numpy, Pandas, LibreOffice Calc Spreadsheets
Deep Learning	Tensorflow
Video Production	Rawtherapee, Adobe Lightroom, Audacity, Kdenlive

Languages

German	native tongue
English	fluent

Publications and Talks

Journals

[1] Stefan Ellmauthaler. Multi-context reasoning in continuous data-flow environments. *KI - Künstliche Intelligenz*, 33(1):101–104, Mar 2019.

[2] Stefan Ellmauthaler and Claudia Schulz. Introduction to the tplp special issue on user-oriented logic programming and reasoning paradigms. *Theory and Practice of Logic Programming*, 19(2):109–113, 2019.

[3] Gerhard Brewka, Stefan Ellmauthaler, Gabriele Kern-Isberner, Philipp Obermeier, Max Ostrowski, Javier Romero, Torsten Schaub, and Steffen Schieweck. Advanced solving technology for dynamic and reactive applications. *KI - Künstliche Intelligenz*, 32(2):199–200, Aug 2018.

[4] Gerhard Brewka, Stefan Ellmauthaler, Ricardo Gonçalves, Matthias Knorr,

João Leite, and Jörg Pührer. Reactive multi-context systems: Heterogeneous reasoning in dynamic environments. *Artificial Intelligence*, 256:68–104, 2018.

[5] Gerhard Brewka, Stefan Ellmauthaler, Hannes Strass, Johannes P. Wallner, and Stefan Woltran. Abstract dialectical frameworks. an overview. *IfCoLog Journal of Logics and their Applications Volume 4, number 8. Formal Argumentation*, 4(8):2263–2317, 10 2017.

Conferences

[6] Stefan Ellmauthaler, Markus Krötzsch, and Stephan Mennicke. Answering Queries with Negation over Existential Rules. In *Proceedings of the 36th AAAI Conference on Artificial Intelligence (AAAI 2022)*, February 2022. to appear.

[7] Stefan Ellmauthaler and Hannes Strass. DIAMOND 3.0 - A native C++ implementation of DIAMOND. In *International Conference on Computational Models of Argument (COMMA 2016), Potsdam, Germany, 12-16 September, 2016.*, volume 287 of *Frontiers in Artificial Intelligence and Applications*, pages 471–472. IOS Press, 2016.

[8] Gerhard Brewka, Stefan Ellmauthaler, Ricardo Gonçalves, Matthias Knorr, João Leite, and Jörg Pührer. Inconsistency management in reactive multi-context systems. In Loizos Michael and Antonis C. Kakas, editors, *European Conferenceon Logics in Artificial Intelligence (JELIA 2016)*, volume 10021 of *Lecture Notes in Computer Science*, pages 529–535, 2016.

[9] Stefan Ellmauthaler and Hannes Strass. The DIAMOND system for computing with abstract dialectical frameworks. In Simon Parsons, Nir Oren, Chris Reed, and Federico Cerutti, editors, *International Conference on Computational Models of Argument (COMMA 2014)*, volume 266 of *Frontiers in Artificial Intelligence and Applications*, pages 233–240. IOS Press, September 2014.

[10] Gerhard Brewka, Stefan Ellmauthaler, and Jörg Pührer. Multi-context systems for reactive reasoning in dynamic environments. In Torsten Schaub, Gerhard Friedrich, and Barry O'Sullivan, editors, *European Conference on Artificial Intelligence (ECAI 2014)*, volume 263 of *Frontiers in Artificial Intelligence and Applications*, pages 159–164. IOS Press, 2014.

[11] Gerhard Brewka, Stefan Ellmauthaler, Hannes Strass, Johannes Peter Wallner, and Stefan Woltran. Abstract dialectical frameworks revisited. In Francesca Rossi, editor, *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI 2013)*. IJCAI/AAAI, August 2013.

[12] Stefan Ellmauthaler and Johannes Peter Wallner. Evaluating Abstract Dialectical Frameworks with ASP. In Bart Verheij, Stefan Szeider, and Stefan Woltran, editors, *International Conference on Computational Models of Argument (COMMA 2012)*, volume 245, pages 505–506. IOS Press, 2012.

Workshops

[13] Stefan Ellmauthaler and Jörg Pührer. Stream packing for asynchronous multi-context systems using ASP. In Thomas Eiter, Wolfgang Faber, and Stefan

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Woltran, editors, *Proceedings of the Workshop on Trends and Applications of Answer Set Programming (TAASP 2016)*, 2016.

[14] Gerhard Brewka, Stefan Ellmauthaler, Ricardo Gonçalves, Matthias Knorr, João Leite, and Jörg Pührer. Towards inconsistency management in reactive multi-context systems. In Richard Booth, Giovanni Casini, Szymon Klarman, Gilles Richard, and Ivan José Varzincza, editors, *Proceedings of the International Workshop on Defeasible and Ampliative Reasoning (DARe-16) co-located with the 22th European Conference on Artificial Intelligence (ECAI 2016), The Hague, Holland, August 29, 2016.*, CEUR Workshop Proceedings. CEUR-WS.org, 2016.

[15] Gerhard Brewka, Stefan Ellmauthaler, and Jörg Pührer. Mulit-context systems for reactive reasoning in dynamic environments. In Stefan Ellmauthaler and Jörg Pührer, editors, *International Workshop on Reactive Concepts in Knowledge Representation (ReactKnow 2014)*, pages 23–30, 2014.

[16] Stefan Ellmauthaler and Jörg Pührer. Asynchronous multi-context systems. In Stefan Ellmauthaler and Jörg Pührer, editors, *International Workshop on Reactive Concepts in Knowledge Representation (ReactKnow 2014)*, pages 31–38, 2014.

[17] Stefan Ellmauthaler. Generalizing multi-context systems for reactive stream reasoning applications. In Andrew V. Jones and Nicholas Ng, editors, *Proceedings of the 2013 Imperial College Computing Student Workshop (ICCSW 2013)*, OpenAccess Series in Informatics (OASIcs), pages 17–24. Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik, September 2013.

[18] Stefan Ellmauthaler and Hannes Strass. The DIAMOND system for argumentation: Preliminary report. In Michael Fink and Yuliya Lierler, editors, *Proceedings of the International Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2013)*, volume abs/1312.6140, September 2013.

Academic treaties

[19] Stefan Ellmauthaler. *Multi-Context Reasoning in Continuous Data-Flow Environments*. PhD thesis, Leipzig University, 2018.

[20] Stefan Ellmauthaler. Abstract Dialectical Frameworks: Properties, Complexity, and Implementation. Master's thesis, Technische Universität Wien, Institut für Informationssysteme, 2012.

Other academic contributions

[21] Stefan Ellmauthaler, Markus Krötzsch, and Stephan Mennicke. Answering Queries with Negation over Existential Rules. *CoRR*, abs/2112.07376, 2021.

[22] Hannes Strass and Stefan Ellmauthaler. goDIAMOND 0.6.6 – ICCMA 2017 system description, 2017. Second International Competition on Computational Models of Argumentation: `http://www.dbai.tuwien.ac.at/iccma17/`.

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[23] Gerhard Brewka, Stefan Ellmauthaler, Ricardo Gonçalves, Matthias Knorr, João Leite, and Jörg Pührer. Reactive multi-context systems: Heterogeneous reasoning in dynamic environments. *CoRR*, abs/1609.03438, 2016.

[24] Stefan Ellmauthaler and Jörg Pührer. Asynchronous multi-context systems. In Thomas Eiter, Hannes Strass, Miroslaw Truszczynski, and Stefan Woltran, editors, *Advances in Knowledge Representation, Logic Programming, and Abstract Argumentation - Essays Dedicated to Gerhard Brewka on the Occasion of His 60th Birthday*, volume 9060 of *Lecture Notes in Computer Science*. Springer, 2015.

Additional Talks

[25] Multi-Context Stream Reasoning. German Conference on Artificial Intelligence Tutorial, Bamberg (online), 21.09.2020.

[26] Multi-Context Reasoning in Continuous Data-Flow Environments - Modelling with reactive Multi-Context Systems. Stream Reasoning Workshop, Linköping, 16.04.2019.

[27] Asynchronous Multi-Context Systems. Stream Reasoning Workshop, Zürich, 16.01.2018.

[28] Inconsistencye Management in Reactive Multi-Context Systems. Stream Reasoning Workshop, Berlin, 8.12.2016.

[29] Inconsistency Management in Reactive Multi-Context Systems. 8th Hybris Workshop, Dresden, 29.11.2016.

[30] Asynchronous Multi-Context Systems 5th Hybris Workshop, Potsdam, 8.6.2015.

[31] Generalizing Multi-Context Systems for Reactive Stream Reasoning Applications. 3rd Hybris Workshop, Dresden, 20.11.2013.

[32] Abstract Dialectical Frameworks. 1st Hybris Workshop, Aachen, 15.11.2012.

Poster

[33] Argumentation for Reactive Reasoning. Doctoral Consortium, 14th International Conference on Principles of Knowledge Representation and Reasoning(KR), Vienna, 2014.

[34] A DIAMOND in Argumentation. Advanced Course on Artificial Intelligence (ACAI), King's College, London, 2013.

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