

Dr. Kai Sauerwald

Curriculum Vitæ

Personal Info

Surname, Name Sauerwald, Kai
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Education

2022 **Dr. rer. nat**, FernUniversität in Hagen
Thesis: Semantics of Belief Change Operators for Intelligent Agents:
Iteration, Postulates and Realizability [10]
Grade: summa cum laude
1. Reviewer: Prof. Dr. Christoph Beierle
2. Reviewer: Prof. Dr. Gabriele Kern-Isberner

10/2014 – 01/2017 **Master of Science in Computer Science**, TU Dortmund University
Thesis title: *Analyse und Synthese Regulärer Ausdrücke: Algorithmen und Komplexität*
Supervisors: Prof. Dr. Thomas Schwentick, Prof. Dr. Thomas Zeume

10/2010 – 09/2014 **Bachelor of Science in Computer Science**, TU Dortmund University
Thesis title: *Visibly Pushdown Automata: VPA mit Ausgabe*
Supervisor: Prof. Dr. Thomas Schwentick

Academic Employments

Since 2022 **Academic staff member**
Artificial Intelligence Group, chair: Prof. Dr. Matthias Thimm
FernUniversität in Hagen, Faculty of Mathematics and Computer Science
Full-time position with teaching duties (non-tenured)

2017 – 2022 **Academic staff member**
Knowledge Based Systems, chair: Prof. Dr. Christoph Beierle
FernUniversität in Hagen, Faculty of Mathematics and Computer Science
Full-time position with teaching duties and contributions to projects funded by The Deutsche Forschungsgemeinschaft (DFG, German Research Foundation):
FADE : Intentional forgetting through cognitive-computational methods of prioritization, knowledge compression and contraction
FADEp: Intentional Forgetting and Changes in Work Processes:
A Process-Conditional Approach in the Administrative and IT Context

Honors and awards

- Best PhD thesis **Best PhD thesis of the Faculty of Mathematics and Computer Science**
(Beste Dissertation des Jahres der Fakultät für Mathematik und Informatik)
Awarded by the FernUniversität in Hagen as part of the DIES ACADEMICUS 2023
- RuleML+RR 2022 **Best Student Paper Award**
6th International Joint Conference on Rules and Reasoning
For the paper *Semantic Characterizations of AGM Revision for Arbitrary Tarskain Logics* [9]
Together with Faiq Miftakhul Falakh and Sebastian Rudolph
- Best scientific work **Best Scientific Work of the Year 2021** (Beste wissenschaftliche Arbeit des Jahres 2021)
For the paper *A Conditional Perspective for Iterated Belief Contraction* [21]
Awarded by the Faculty of Mathematics and Computer Science, FernUniversität in Hagen
- ECAI 2020 **Distinguished Paper Award**
24th European Conference on Artificial Intelligence
For the publication *A Conditional Perspective for Iterated Belief Contraction* [21]
Together with Gabriele Kern-Isberner und Christoph Beierle

Academic Activities

- Chair SIG KRR @ GI **Chair of the special interest group Knowledge Representation and Reasoning**
(Fachgruppe Wissensrepräsentation und Schließen) of the technical committee Artificial Intelligence (Fachbereich Künstliche Intelligenz) of the German Computer Science Association (GI, Gesellschaft für Informatik), since 2024
- Guest Editor International Journal of Approximate Reasoning (**IJAR**)
- Journal Reviewer Artificial Intelligence (**AIJ**)
Applied Artificial Intelligence (**AAP**)
International Journal of Approximate Reasoning (**IJAR**)
Journal of Artificial Intelligence Research (**JAIR**)
Künstliche Intelligenz (**KUIN**)
Synthese
Studia Logica
- Program committee International Conference of Principles of Knowledge Representation and Reasoning (**KR**), since 2022
Annual Meeting of the Cognitive Science Society (**CogSci**), 2017 to 2022
AAAI Conference on Artificial Intelligence (**AAAI**), since 2022
International Joint Conference on Artificial Intelligence (**IJCAI**), since 2023
European Conference on Logics in Artificial Intelligence (**JELIA**), since 2023
Cognition And OntologieS (**CAOS**), since 2024
- Sub-reviewer Since 2017 for all major conferences and workshops in knowledge representation and reasoning, including AAAI, IJCAI, JELIA and KR
- Tutorials **Cognitive Logics: Mechanisms Predicting Human Inference Patterns**
Held at ECAI 2020 jointly with Marco Ragni and Gabriele Kern-Isberner
Forgetting in Knowledge Representation and Reasoning
Held at ICCS 2022

Invited Activities

- University of Helsinki 2024 **Research Visit at the University of Helsinki**
Invited by Prof. Juha Kontinen.
Including an **Invited-Talk** with the title “*A Semantic Perspective of AGM Belief Revision in Tarskian Logics*” at the Helsinki Logic Seminar
- BRAON 2024 **6th Workshop On Belief Revision, Argumentation, Ontologies, and Norms**
Invitation-only event for scientific exchange on Madeira Island, Portugal
- ICCS 2022 **27th International Conference on Conceptual Structures**
Tutorial with title “*Forgetting in Knowledge Representation and Reasoning*”
- BRAON 2022 **5th Workshop On Belief Revision, Argumentation, Ontologies, and Norms**
Invitation-only event for scientific exchange on Madeira Island, Portugal
- ECAI 2020 **24th European Conference on Artificial Intelligence**
Title: “*Cognitive Logics: Mechanisms Predicting Human Inference Patterns*”
Tutorial held at ECAI 2020 jointly with Marco Ragni and Gabriele Kern-Isberner
- BRAON 2019 **4th Workshop On Belief Revision, Argumentation, Ontologies, and Norms**
Invitation-only event for scientific exchange on Madeira Island, Portugal
- KR Conventicle 2019 **Knowledge Representation Conventicle 2019**
Co-located with the 16th Pacific Rim International Conference on Artificial Intelligence
Invited-Talk with the title “*Forgetting and Gradual Iterated Contraction*”

PC Co-Chair

- ECSQARU 2025 **18th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty**,
Will be in September 2025, in Hagen, Germany
- UR@FLAIRS 2024 **Uncertain Reasoning Special Track at the 37th International FLAIRS Conference**,
May 19-21, 2024, Miramar Beach, Florida, USA
<https://ur-flairs.github.io/2024/>
- FCR 2023 **9th Workshop on Formal and Cognitive Reasoning**,
September 26, 2023: in Berlin, Germany
<https://www.fernuni-hagen.de/wbs/fcr2023.html>
- ICCS 2023 **28th International Conference on Conceptual Structures**,
September 11 – 13, 2023, Berlin, Germany
<https://iccs-conference.org>
- NMR 2023 **21st International Workshop on Nonmonotonic Reasoning**,
September 2-4, 2023, Rhodes, Greece
<http://nmr.krportal.org/2023/>
- UR@FLAIRS 2023 **Uncertain Reasoning Special Track at the 36th International FLAIRS Conference**,
May 14-17, 2023, Clearwater Beach, Florida, USA
<https://ur-flairs.github.io/2023/>
- FCR 2022 **8th Workshop on Formal and Cognitive Reasoning**,
September 19, 2022: Virtual in Trier, Germany
<https://www.fernuni-hagen.de/wbs/fcr2022.html>

Local Organization

- ECSQARU 2025 **18th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty**,
Local Organizer. Will be in September 2025, in Hagen, Germany
- COMMA 2024 **10th International Conference on Computational Models of Argument**,
Workshop and Summer School Contact. Will be in September 2024, in Hagen, Germany

Independent Teaching

- 2024 Seminar Logiken in der Künstlichen Intelligenz (**Seminar on logics in AI**)
since 2022 Deduktions- und Inferenzsysteme (**Deduction Systems and Inference Systems**)
rotation: annual Topics: propositional and predicate logics, Herbrand semantics, logic calculi, resolution, tableau methods, equational unification, paramodulation, term-rewriting systems, logic programming, non-monotonic reasoning, probabilistic reasoning
- since 2023 **Supervision and reviewing of Bachelor and Master theses**
Tutorials Please see also the tutorials listed in “Invited Activities”

Other Teaching Experiences

- since 2017 **Co-Supervision of theses**
Co-supervision of more than 20 bachelor’s theses and master’s theses
- since 2017 **Seminars on *Logic and Knowledge Representation and Reasoning***
rotation: semiannual Topics: current research on logic methods in knowledge representation and reasoning
Duties: supervision of 3-5 students (undergraduate and graduate), including finding an appropriate seminar topic for these students
- 2020 – 2022 **Logisches und funktionales Programmieren (logic and Functional Programming)**
rotation: annual Topics: logic programming with Prolog, functional programming with Scheme
Duties: assisting on exams, tutoring students, administrating tutorials
- 2020 – 2021 **Deduktions- und Inferenzsysteme (Deduction and Inference Systems)**
rotation: annual Topics: propositional and predicate logics, Herbrand semantics, logic calculi, resolution, tableau methods, equational unification, paramodulation, term-rewriting systems, logic programming, non-monotonic reasoning, probabilistic reasoning
Duties: assisting on exams, tutoring students, administrating tutorials
- 2017 – 2020 **Wissensbasierte Systeme (Knowledge-Based Systems)**
rotation: annual Topics: propositional and predicate logics, rule-based systems, machine learning, case-based reasoning, non-monotonic logics and reasoning with uncertainty
Duties: assisting on exams, tutoring students, administrating tutorials
- 2017 – 2020, **Methoden der Wissensrepräsentation und -verarbeitung (Knowledge Representation and Reasoning)**
since 2023 rotation: annual Topics: propositional and predicate logics, probability and information theory, resolution, actions and planning, truth maintenance-systems, default logics, probabilistic networks, Dempster–Shafer theory, fuzzy-logics
Duties: assisting on exams, tutoring students, administrating tutorials

Administrative Services

- since 2024 **Faculty Council**
Faculty of Mathematics and Computer, FernUniversität in Hagen
- 2020 – 2022 **Habilitation committee**
Faculty of Mathematics and Computer, FernUniversität in Hagen
- 2020 **Appointment committee for a new professor for databases and information systems**
Faculty of Mathematics and Computer, FernUniversität in Hagen
- 2015 – 2017 **Appointment committee for a new professor for software engineering**
Department of Computer Science, TU Dortmund University
- 2015 – 2017 **Doctoral committee**
Department of Computer Science, TU Dortmund University
- 2013 **Appointment committee for a new professor for data mining**
Department of Computer Science, TU Dortmund University
- 2012 **Appointment committee for a new professor for bioinformatics**
Faculty of Biology and Biotechnology, Ruhr University Bochum

Co-Authored Grants and Further Raised Funding

FADEp **Intentionales Vergessen und Änderungen in Arbeitsprozessen: Ein prozesskonditional-orientierter Ansatz im Verwaltungs- und IT Kontext**
(Intentional Forgetting and Changes in Work Processes: A Process-Conditional Approach in the Administrative and IT Context)

Principle investigators: Christoph Beierle, Gabriele Kern-Isberner, Marco Ragni
Successfully funded by the *German Research Foundation* (DFG) as part of the priority program 1921 “*Intentional Forgetting in Organizations*”.

NMR 2023 **Two student grants** for the *21st International Workshop on Nonmonotonic Reasoning* (NRM 2023) successfully funded by the “Funding Opportunities for Promoting AI Research” program from the *Artificial Intelligence Journal*

UR@FLAIRS 2024 **One invited speaker** (Adnan Darwiche) for the *Uncertain Reasoning Special Track at the 37th International FLAIRS Conference* (UR@FLAIRS) successfully funded by the *Florida AI Research Society*

Software

logical-systems This library allows modelling/implementing logics that fit into the general scheme of "Institutions" from category theory.

See: <https://github.com/Landarzar/logical-systems>

alchourron This collection of libraries and programs allows modelling/execution of belief revision and belief contraction operators. Joint work with the student Phillip Heltweg.

For a starting point see: <https://github.com/Landarzar/alchourron>

SystemP-tree This software allows to compute a proof tree of a System P inference.

See: <https://github.com/Landarzar/System-P-Proof-Tree>

References

Prof. Dr. Christoph Beierle

Chair of the Knowledge Based Systems group
Faculty of Mathematics and Computer, FernUniversität in Hagen
Email: christoph.beierle@fernuni-hagen.de

Prof. Dr. Sebastian Rudolph

Chair of the Computational Logics group
Faculty of Computer Science, TU Dresden
Email: sebastian.rudolph@tu-dresden.de

Prof. Dr. Gabriele Kern-Isbener

Chair of the Information Engineering group
Department of Computer Science, TU Dortmund University
Email: gabriele.kern-isberner@cs.uni-dortmund.de

Prof. Dr. Matthias Thimm

Chair of the Artificial Intelligence Group
Faculty of Mathematics and Computer, FernUniversität in Hagen
Email: matthias.thimm@fernuni-hagen.de

Dortmund, April 15, 2024



Dr. Kai Sauerwald