

Curriculum Vitae

Personal Details

Name	Clemens Hofstadler
Affiliation	Institute for Symbolic Artificial Intelligence and Research Institute for Symbolic Computation (RISC), Johannes Kepler University, Linz, Austria
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Education

05.2020 – 10.2023	PhD in Computer Mathematics , Johannes Kepler University, Austria received Promotio sub auspiciis Praesidentis rei publicae (March 2025)
02.2020 – 02.2022	Master in Artificial Intelligence , Johannes Kepler University, Austria passed with distinction
03.2019 – 05.2020	Master in Computer Mathematics , Johannes Kepler University, Austria passed with distinction
10.2015 – 03.2019	Bachelor in Technical Mathematics , Johannes Kepler University, Austria passed with distinction

Positions

03.2026 – present	University Assistant , Institute for Symbolic Artificial Intelligence and Research Institute for Symbolic Computation (RISC), Johannes Kepler University, Austria
03.2024 – 02.2026	Postdoctoral Researcher , LIT AI Lab, Johannes Kepler University, Austria
03.2022 – 02.2024	Predoctoral Researcher , Institute of Mathematics, University of Kassel, Germany
12.2019 – 02.2022	Predoctoral Researcher , Institute for Algebra, Johannes Kepler University, Austria

Net Research Experience

6 years and 7 months (3 years 10 months predoctoral, 2 years 9 months postdoctoral, as of July 2026)

Research Interests

Computer algebra, Symbolic computation, Computational logic, Satisfiability checking, Automated reasoning, Formal verification

Awards

- 2025 **Promotio sub auspiciis Praesidentis rei publicae** awarding outstanding academic achievements in Austria. It is the highest possible distinction for academic achievements for a doctoral degree in Austria, awarded by the Federal President. Austrian Federal Ministry of Education, Science and Research, Vienna, Austria.
- 2024 **Dissertationspreis** (Dissertation prize) awarded by the Fachgruppe Computeralgebra for an outstanding dissertation in the field of computer algebra. Fachgruppe Computeralgebra, Leipzig, Germany.
- 2024 **JKU Young Researchers' Award** recognizing outstanding scientific achievements during the PhD. Johannes Kepler University, Linz, Austria.
- 2023 **Young Talent Award** recognizing an aspiring young researcher in the field of computer algebra. Computeralgebra-Tagung 2023, Hannover, Germany.
- 2020 **Würdigungspreis** (Appreciation award) recognizing the 50 best graduates of diploma and master studies at Austrian universities and Fachhochschulen. Austrian Federal Ministry of Education, Science and Research, Vienna, Austria.

Academic Publications

Journals

18. Clemens Hofstadler and Viktor Levandovskyy. *Modular algorithms for computing Gröbner bases in free algebras*. Journal of Symbolic Computation 137, 102581, 2026. DOI: [10.1016/j.jsc.2026.102581](https://doi.org/10.1016/j.jsc.2026.102581)
17. Clemens Hofstadler, Clemens G. Raab, and Georg Regensburger. *Universal truth of operator statements via ideal membership*. Journal of Pure and Applied Algebra, 230, 108221, 2026. DOI: [10.1016/j.jpaa.2026.108221](https://doi.org/10.1016/j.jpaa.2026.108221)
16. Clemens Hofstadler and Thibaut Verron. *Short proofs of ideal membership*. Journal of Symbolic Computation 125, 102325, 2024. DOI: [10.1016/j.jsc.2024.102325](https://doi.org/10.1016/j.jsc.2024.102325)
15. Clemens Hofstadler, Clemens G. Raab, and Georg Regensburger. *Computing Elements of Certain Form in Ideals to Prove Properties of Operators*. Mathematics in Computer Science 16, 19 pages, 2022. DOI: [10.1007/s11786-022-00536-5](https://doi.org/10.1007/s11786-022-00536-5)
14. Clemens Hofstadler and Thibaut Verron. *Signature Gröbner bases, bases of syzygies and cofactor reconstruction in the free algebra*. Journal of Symbolic Computation 113, p. 211–241, 2022. DOI: [10.1016/j.jsc.2022.04.001](https://doi.org/10.1016/j.jsc.2022.04.001)
13. Dragana S. Cvetković-Ilić, Clemens Hofstadler, Jamal Hossein Poor, Jovana Milošević, Clemens G. Raab, and Georg Regensburger. *Algebraic proof methods for identities of matrices and operators: Improvements of Hartwig's triple reverse order law*. Applied Mathematics and Computation 409, 126357, 10 pages, 2021. DOI: [10.1016/j.amc.2021.126357](https://doi.org/10.1016/j.amc.2021.126357)

Conferences

12. Clemens Hofstadler, Daniela Kaufmann, and Chen Chen. *Avoiding Big Integers: Parallel Multimodular Algebraic Verification of Arithmetic Circuits*. In: Proceedings of International Joint Conference on Automated Reasoning (IJCAR) 2026, to appear, 2026.

11. David Kattermann, Clemens Hofstadler, and Martina Seidl. *Definition-Based Dependency Schemes*. In: International Conference on Theory and Applications of Satisfiability Testing (SAT) 2026, pp. 22:1–22:18, 2026. DOI: [10.4230/LIPIcs.SAT.2026.22](https://doi.org/10.4230/LIPIcs.SAT.2026.22)
10. Clemens Hofstadler, Peter Krug, and Georg Regensburger. *Refuting Noncommutative Ideal Membership via Matrix Certificates*. In: Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC) 2026, pp. 209–218, 2026. DOI: [10.1145/3815436.3815447](https://doi.org/10.1145/3815436.3815447)
9. Maximilian Heisinger and Clemens Hofstadler. *f4ncgb: High Performance Gröbner Basis Computations in Free Algebras*. In: Proceedings of International Workshop on Computer Algebra in Scientific Computing (CASC) 2025, Lecture Notes in Computer Science, vol 16235, pp. 79–97, 2025. DOI: [10.1007/978-3-032-09645-6_5](https://doi.org/10.1007/978-3-032-09645-6_5)
8. Paul Seip, Johannes Fürnkranz, Florian Beck, Clemens Hofstadler, Peter Pfeiffer, Martina Seidl, Robert Peharz, and Stefan Szeider. *Towards SAT-Based Learning of NNF Networks*. In: Proceedings of International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC) 2025, pp. 1-5, 2025. DOI: [10.1109/SYNASC69064.2025.00024](https://doi.org/10.1109/SYNASC69064.2025.00024)
7. Andreas Plank, Clemens Hofstadler, Maximilian Heisinger, and Martina Seidl. *Refinement-Based Enumeration of QBF Solutions*. In: Proceedings of 19th European Conference on Logics in Artificial Intelligence (JELIA) Part II, pp. 166–181, 2025. DOI: [10.1007/978-3-032-04590-4_-12](https://doi.org/10.1007/978-3-032-04590-4_-12)
6. Clemens Hofstadler and Daniela Kaufmann. *Guess and Prove: A Hybrid Approach to Linear Polynomial Recovery in Circuit Verification*. In: Proceedings of the 31th International Conference on Principles and Practice of Constraint Programming (CP 2025), pp. 14:1–14:22, 2025. DOI: [10.4230/LIPIcs.CP.2025.14](https://doi.org/10.4230/LIPIcs.CP.2025.14)
5. Klara Bernauer, Clemens Hofstadler, and Georg Regensburger. *How to Automate Proofs of Operator Statements: Moore-Penrose Inverse – A Case Study*. In: Proceedings of Computer Algebra in Scientific Computing (CASC) 2023, p. 39–68, 2023. DOI: [10.1007/978-3-031-41724-5_3](https://doi.org/10.1007/978-3-031-41724-5_3)
4. Clemens Hofstadler and Thibaut Verron. *Signature Gröbner bases in free algebras over rings*. In: Proceedings of International Symposium on Symbolic and Algebraic Computation (ISSAC) 2023, p. 298–306, 2023. DOI: [10.1145/3597066.3597071](https://doi.org/10.1145/3597066.3597071)
3. Cyrille Chenavier, Clemens Hofstadler, Clemens G. Raab, and Georg Regensburger. *Compatible rewriting of noncommutative polynomials for proving operator identities*. In: Proceedings of International Symposium on Symbolic and Algebraic Computation (ISSAC) 2020, p. 83–90, 2020. DOI: [10.1145/3373207.3404047](https://doi.org/10.1145/3373207.3404047)
2. Clemens Hofstadler, Clemens G. Raab, and Georg Regensburger. *Certifying operator identities via noncommutative Gröbner bases*. In: ACM Communications in Computer Algebra 53, 2, p. 49–52, 2019. DOI: [10.1145/3371991.3371996](https://doi.org/10.1145/3371991.3371996)

Workshops

1. Daniela Kaufmann and Clemens Hofstadler. *Recycling Algebraic Proof Certificates*. In: Proceedings of International Workshop on Satisfiability Checking and Symbolic Computation 2025, vol 4116, pp. 35–40, 2025. URL: ceur-ws.org/Vol-4116/

Other Publications

0. Clemens Hofstadler. *Proving Operator Identities with Computer Algebra*. Computeralgebra-Rundbrief Nr. 74, 7 pages, 2024.

Software

TalisMan2.0	State-of-the-art C++ tool for algebraic verification of arithmetic circuits
f4ncgb	State-of-the-art C++ library for noncommutative Gröbner bases; default engine in the Oscar computer algebra system
operator_gb	SageMath package for automatically proving operator statements; also allows noncommutative Gröbner basis computations

Selected Talks

Invited Talks

11.2025	<i>Algebraic Automated Theorem Proving</i> , Effective Algebra Days, Limoges
10.2025	<i>Algebraic First-Order Theorem Proving</i> , Dynaverse Workshop, MPI Saarbrücken
09.2025	<i>Algebraic Circuit Verification via Local Linearization</i> , Annual ÖMG-DMV Meeting, Linz
07.2025	<i>Recent Advancements in Noncommutative Gröbner Basis Software</i> , ACA 2025, Heraklion
06.2025	<i>Algebraic First-Order Theorem Proving</i> , Tagung Fachgruppe Computeralgebra, Leipzig
10.2024	<i>First-order theorem proving for operator statements</i> , Dagstuhl Seminar 24421, Dagstuhl
07.2023	<i>A semi-decision procedure for proving operator statements</i> , ACA 2023, Warsaw
01.2023	<i>Gröbner bases in the free algebra</i> , Séminaire Calcul Formel, Limoges
07.2021	<i>Automatizing proofs of properties of operators</i> , ACA 2021, online
04.2021	<i>Computing noncommutative Gröbner bases and certifying operator identities</i> , Algebraic Rewriting Seminar, online

Contributed Talks

07.2026	<i>Refuting Noncommutative Ideal Membership via Matrix Certificates</i> , ISSAC 2026, Oldenburg
11.2025	<i>f4ncgb: High Performance Gröbner Basis Computations in Free Algebras</i> , CASC 2025, Dubai
09.2024	<i>Short proofs of ideal membership</i> , CASC 2024, Rennes
08.2023	<i>How to Automate Proofs of Operator Statements</i> , CASC 2023, Havana
07.2023	<i>Signature Gröbner bases in free algebras over rings</i> , ISSAC 2023, Tromsø
06.2023	<i>Automated proofs of operator statements</i> , ILAS 2023, Madrid
06.2023	<i>Automated proofs of operator statements</i> , Computeralgebra-Tagung 2023, Hannover
09.2021	<i>Computing elements of certain form in ideals</i> , CASC 2021, Sochi/online

Teaching

Since WS 2020/2021 I have taught approximately 20 different courses at Johannes Kepler University Linz and University of Kassel, as lecturer, co-lecturer, and exercise instructor, for students in mathematics, computer science, AI, and engineering. Course sizes ranged from 5 to 600 students.

- Lectures:** Computational Logics for AI, Special Lecture on Symbolic Computation, Special Lecture on Gröbner Bases
- Exercises:** Computational Logics for AI, Formal Models, Mathematics for AI I–III, Linear Algebra I & II, Algebra for Computer Science, Mathematics I & II, Discrete Structures
- Seminars:** Bachelor’s and Master’s Thesis Seminars in AI

Supervision

Master’s Theses

- Georg Honauer. *A Parser for Operator Statements*. Johannes Kepler University Linz, Austria. Ongoing.
- Peter Krug. *Undecidability of Noncommutative Ideal Membership and Counterexamples via SAT*. University of Kassel, Germany, March 2025. Co-supervised with Georg Regensburger.
- Christoph Heidemann. *Noncommutative Gröbner Bases over Euclidean Domains and the F_4 Algorithm*. University of Kassel, Germany, March 2025. Co-supervised with Georg Regensburger.

Bachelor’s Theses

- Felix Wilhelmer. *QBF Encodings for Quantum Computing*. Johannes Kepler University Linz, Austria. Ongoing.
- Mathias Kröpfel. *The Fukuoka MQ Challenge*. Johannes Kepler University Linz, Austria. Ongoing.
- Boris Marković. *SAT-Based Methods for Discovering Efficient Matrix Multiplication Algorithms*. Johannes Kepler University Linz, Austria, June 2026.
- Maximilian Gruber. *Automated First-Order Theorem Proving*. Johannes Kepler University Linz, Austria, April 2026.
- Thomas Kopper. *Neurosymbolic AI for the Boxgame*. Johannes Kepler University Linz, Austria, March 2026.

Academic Service

ISSAC 2026	Software Presentation Committee
iFM 2025	Artifact Evaluation Committee
FMCAD 2025	Student Forum Program Committee
(Sub-)Reviewer	ISSAC, JSC, SAT, STACS, TOMS
Self-governance	Member of the Institute Assembly (Institutsversammlung) and deputy member of the Faculty Assembly (Fakultätsversammlung), JKU Linz

Miscellaneous

Languages	German (native), English (fluent), Spanish (basic)
Programming	Bash, C, C++, Python, Julia
Computer Algebra	Mathematica, Matlab, Oscar, SageMath, Singular