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Languages: English (Native)
German (B1)

David M. Cerna

Curriculum Vitae (Long)

Research Areas
Automated Reasoning, Inductive Synthesis

Research Positions

Sep. 2020 – Current **Scientist**, Department of Artificial Intelligence, Institute of Computer Science, Czech Academy of Science, Prague, Czechia (cs.cas.cz/artificial-intelligence/en)
Details: Tenure-track research position

Aug. 2020 – Feb. 2023 **Principal Investigator**, Research Institute for symbolic computation (RISC), Johannes Kepler University (JKU), Linz, Austria
Details: Leading the Math$_{LP}$ project.

Sep. 2018 – Aug. 2020 **Postdoc**, *Logic Technology for Computer Science Education (LOGTECHEDU)*
Institute for Formal Methods and Verification (FMV), JKU, Linz, Austria

Mar. 2017 – Aug. 2018 **Postdoc**, *Generalization ALgorithms and Applications (GALA)*
RISC, JKU, Linz, Austria

Feb. 2015 – Mar. 2017 **Postdoc**, *The Optimized Checking of Time-Quantified Logic Formulas with Applications in Computer Security (LogicGuard II)*
RISC, JKU, Linz, Austria

Education

Apr. 2015 **PhD in Computer Science**, *TU Wien*, Vienna, Austria
Computational Proof Theory and automated deduction (Supervisor: Alexander Leitsch)

Aug. 2010 **Master of science, Computer Science** , *Rensselaer Polytechnic Institute (RPI)*, Troy, New York,USA
Network security and Cryptography (Supervisor: Bülent Yener)

May 2010 **Bachelor of science**, *RPI*, Troy, New York, USA, Mathematics

May 2010 **Bachelor of science**, *RPI*, Troy, New York, USA, Computer Science

Research Grants

July 2022 – June 2025 **22-06414L**, *(PANDAFOREST) Proof analysis AND Automated deduction FOr REcursive STructures*, Hosts: CAS ICS, Prague, Czechia, and Kurt Gödel Society, Vienna, Austria, Funded by FWF and GACR, Lead Agency International Project
Funding: 188000 Euros (**Czechia**), 225000 Euros (**Austria**)

Aug. 2020 – Feb. 2023 **LIT-2019-7-YOU-213**, *(Math$_{LP}$) Learning to Prove by MATHematical Induction: Invariant Discovery Aided by Modern Machine Learning Technology*, Host: RISC, JKU, Linz, Austria, Funding provided by Upper Austrian Government
Funding: 160,500 Euros

Travel Grants

August 2024 **EUROPROOFNET-STSM**, *Title: Exploring anti-unification over typed languages and equational theories.*, Host: Temur Kutisa, research Institute of Symbolic Computation, Linz, Austria, Funding: 1820 Euros
europroofnet.github.io/accepted_stsms/

July 2024 **EUROPROOFNET-ITCG**, *Paper: Equational Anti-Unification over Absorption Theories*, conference: International Joint Conference on Automated Reasoning + (UNIF 2024), Funding: 2000 Euros
https://europroofnet.github.io/accepted_itcgs/

August 2023 **EUROPROOFNET-ITCG**, *Paper: Anti-unification and Generalization: A Survey*, conference: 32nd International Joint Conference on Artificial Intelligence (IJCAI), Funding: 2000 Euros
https://europroofnet.github.io/accepted_itcgs/

Sep. 2021 – Dec. 2021 **CAS ICS outgoing Junior Researcher Fellowship**, *Three Month Research Visit*, Host: University of Innsbruck, Austria, Funding provided by Czech Ministry of Education, Youth and Sports
Funding: 13,000 Euros

Project Employees

May 2023 – June 2025 **Raheleh Jalali** , *Czech Academy of Science, Institute of Computer Science, Prague, Czechia*, Postdoc funded by PANDAFOREST

May 2022 – Feb. 2023 **Michal Buran**, *Research Institute of Symbolic Computation, JKU, Linz, Austria*, Postdoc funded by Math$_{LP}$

Participation in Supervision (unofficial)

PhD students, *Andrés González (current, Advisor: Mauricio Ayala Rincon, Temur Kutsia), Liao Zhang (current, Advisor: Cezary Kaliszyk), Stanislaw J. Purgal (2021-2022, Advisor: Cezary Kaliszyk), Lee Barnett (2019–2020, Advisor: Armin Biere), Anela Lolic (2016–2019, Advisor: Alexander Leitsch)*

Master students, *Greog Schauberger (2019, Advisor: Martina Seidl), Andrea Condoluci (2016, Advisor: Alexander Leitsch)*

Bachelor students, *Simone Atzwanger (2020, Advisor: Martina Seidl)*

Sep. 2022 **Conference on Intelligent Computer Mathematics (CICM 2022) (Doctoral Programme)**, *Mentored: Gabriel Ferreira Silva*
https://cicm-conference.org/2022/cicm.php?event=doctoral&menu=general

Professional Service

Journal Reviewer, *ACM Transactions in Computational Logic (TOCL), Journal of Logic and Computation (JLC), Journal of Symbolic Computation (JSC), Mathematical Structures in Computer Science (MSCS), Information Processing Letters (IPL), Annals of Mathematics and Artificial Intelligence (AMAI), Data Mining and Knowledge Discovery (DMKD), Journal of Automated Reasoning (JAR), Journal of Artificial Intelligence Research (JAIR), Archive of Mathematical Logic (AML)*

Program Committee, *LFSA 25, Analogy-ANGLE II (ACL Workshop 25), IJCAI-25 (Surveys), Analogy-ANGLE (IJCAI Workshop 24), SC^2 24, DCAI 24, AITP 24, IJCAI-24 (Surveys), UNIF 24, TACAS 24 (artifacts), SCSS 24, LSFA 23, UNIF 23, ThEdu 23, AReCCa 2023, XI-ML 23, UNIF 22, ThEdu 22, CICM 22, SCSS 21, UNIF 21, ThEdu 21, ThEdu 20, SIGCSE 20, ICAI 20, SD 19*

June 24-27, 2024 **Organizer and Lecturer**, *Summer School on AI for Reasoning and Processing of Mathematics*, Kutaisi,Georgia, Funded by Cost Action EUROPROOFNET (approx. 5300 Euros)
europroofnet.github.io/Kutaisi24/

Apr. 19-20, 2023 **Organizer**, *Workshop on Datasets Generation for Data-Deficient Domains (DG4D^3)*, Prague, Czechia, Funded by Cost Action EUROPROOFNET (approx. 6000 Euros)
europroofnet.github.io/Prague23/

July 1-2, 2023 **Co-Organizer**, *18th Logical and Semantic Frameworks with Applications (LSFA 2023)*, Rome, Italy
sites.google.com/ufg.br/lsfa2023/home?authuser=0

Aug. 12, 2022 **Co-Chair**, *36th International Workshop on Unification (UNIF-22)*, Haifa, Israel
www.cs.cas.cz/unif-2022/

2022-2026 **Steering Committee**, *International Workshop on Unification*
www.irif.fr/ treinen/unif/steering-committee.html

2022-2025 **Management Committee (COST Action CA20111)**, *European Research Network on Formal Proofs* , Representing Czechia
www.cost.eu/actions/CA20111/

2024-2025 **Working Group 5 Leader (COST Action CA20111)**, *European Research Network on Formal Proofs* , Working group on machine learning in proofs
www.cost.eu/actions/CA20111/

2021-Current **Institute Representative**, *Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE)*, Representative for CAS ICS within the CLAIRE Network of research laboratories
https://claire-ai.org/network/

Research Visits

Aug. 2024 **Temur Kutsia**, *Research Institute of Symbolic Computation, Linz, Austria*, Duration: 2 weeks

Apr. 2024 **Ute Schmid**, *Otto-Friedrich-University Bamberg, Germany*, Duration: 2 weeks

Nov. 2023 **Andrew Cropper**, *University of Oxford, United Kingdom*, Duration: 2 weeks

Sep. 2023 **Cezary Kaliszyk**, *University of Innsbruck, Austria*, Duration: 2 weeks

May 2023 **Bahareh Afshari**, *Gothenburg, Sweden*, Duration: 3 weeks

Oct. 2022 **Daniel Nantes**, *Imperial College London, United Kingdom*, Duration: 1 week

Sep. 2022 **Andrew Cropper**, *University of Oxford, United Kingdom.*, Duration: 2 weeks

Sep. 2021 **Cezary Kaliszyk**, *University of Innsbruck, Austria.*, Duration: 3 months

Feb. 2018 **Sorin Stratulat**, *University of Lorraine, France.*, Duration: 1 week

Feb. 2014 **Nicolas Peltier**, *CNRS - Laboratory of Informatics of Grenoble*, Duration: 1 week

Invited Talks

Sept. 12-16, 2024 **Eighteenth International Tbilisi Summer School in Logic and Language** , *on CERES (cut elimination by resolution)*, Tbilisi, Georgia
www.logic.at/tbilisi24/

Feb. 8, 2023 **XVI Summer Workshop in Mathematics**, *Anti-unification: Introduction, Applications, and Recent Results.*, (Plenary Talk), University of Brasilia, Brasilia, Brazil
mat.unb.br/verao2024/verao.html

July 12, 2022 **KIU Annual Conference on Math and Computer Science**, *Inductive Logic Programming: the Basics, and Modern Approaches to Symbolic Learning*, Kutaisi International University, Tbilisi, Georgia
www.kiu.edu.ge/index.php?m=205&news_id=229&lng=eng

Feb. 9, 2021 **XIII Summer Workshop in Mathematics**, *Session on Theoretical Computer Science*, University of Brasilia, Brasilia, Brazil
mat.unb.br/verao2021/computacao_en.html

Specialized Workshops

Nov. 2025 **Dagstuhl Seminar**, *Approaches and Applications of Inductive Programming*
www.dagstuhl.de/25491

Nov. 2023 **Dagstuhl Seminar**, *Approaches and Applications of Inductive Programming*
www.dagstuhl.de/23442

Peer-Reviewed Publications[1]

(29) **Minghao Liu, David M. Cerna, Filipe Gouveia, Andrew Cropper**, *Scalable Knowledge Refactoring using Constrained Optimisation* , 39^{th} AAAI Conference on Artificial Intelligence (AAAI-25), To Appear, Year: 2025, (Core 2023: A*)
DOI: arxiv.org/abs/2408.11530

(28) **Stanislaw J. Purgal, David M. Cerna, Cezary Kaliszyk**, *Differentiable Inductive Logic Programming in High-Dimensional Space*, International Joint Conference on Learning & Reasoning (IJCLR), *to Appear*, Pages: 1-15, Year: 2024, (Core 2023: B (formerly ILP))
DOI: arxiv.org/abs/2208.06652

(27) **Liao Zhang, David M. Cerna, Cezary Kaliszyk**, *Differentiable Inductive Logic Programming in High-Dimensional Space*, International Joint Conference on Learning & Reasoning (IJCLR), *to Appear*, Pages: 1-15, Year: 2024, (Core 2023: B (formerly ILP))
DOI: Not published yet.

[1]Venue rankings taken from portal.core.edu.au/conf-ranks/ and scimagojr.com/journalrank.php. Majority of publications (28 of 29) are the result of investigations completed after recieving PhD.

(26) **Mauricio Ayala-Rincón, David M. Cerna, Andrés Felipe González Barragán, and Temur Kutsia**, *Equational Anti-Unification over Absorption Theories* , International Joint Conference on Automated Reasoning (IJCAR-24), Year: 2024, (Core 2023: A)
DOI: doi.org/10.1007/978-3-031-63501-4_17

(25) **Lasse Blaauwbroek, David M. Cerna, Thibault Gauthier, Jan Jakubův, Cezary Kaliszyk, Martin Suda, Josef Urban**, *Learning Guided Automated Reasoning: A Brief Survey*, Logics and Type Systems in Theory and Practice: Essays Dedicated to Herman Geuvers on The Occasion of His 60th Birthday (Festschrift), Year: 2024, (Unranked)
DOI: doi.org/10.1007/978-3-031-61716-4

(24) **David M. Cerna and Michal Buran**, *One or Nothing: Anti-unification over the Simply-Typed Lambda Calculus*, ACM Transactions in Computational Logic (TOCL), Volume 25, Issue 3, Article No.: 16, pp 1–12, Year: 2024, (Scimago 2023: Q1,Logic)
DOI: dx.doi.org/10.1145/3654798
ARXIV: doi.org/10.48550/arXiv.2207.08918

(23) **David M. Cerna, Andrew Cropper**, *Generalisation Through Negation and Predicate Invention*, 38^{th} AAAI Conference on Artificial Intelligence (AAAI-24), Pages: 10467-10475, Year: 2024, (Core 2023: A*)
DOI: doi.org/10.1609/aaai.v38i9.28915

(22) **David M. Cerna, Temur Kutsia**, *Anti-unification and Generalization: A Survey*, *32^{nd} International Joint Conference on Artificial Intelligence, IJCAI-23*, Pages 6563-6573, Year: 2023, (Core 2023: A*)
DOI: doi.org/10.24963/ijcai.2023/736

(21) **Stanislaw J. Purgal, David M. Cerna, Cezary Kaliszyk**, *Learning Higher-Order Programs From Failures*, *31^{st} International Joint Conference on Artificial Intelligence, IJCAI-22*, Pages: 2726-2733, Year: 2022, (Core 2021: A*)
DOI: doi.org/10.24963/ijcai.2022/378

(20) **David M. Cerna, Alexander Leitsch, Anela Lolic**, *Schematic Refutations of Formula Schemata*, Journal of Automated Reasoning volume 65, Pages 599–645, Year: 2021, (Scimago 2021: Q2, AI)
DOI: doi.org/10.1007/s10817-020-09583-8

(19) **David M. Cerna**, *A Special Case of Schematic Syntactic Unification*, 23^{rd} International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC 2021), Pages: 75-82, Year: 2021, (Core 2021, Nat.)
DOI: doi.org/10.1109/SYNASC54541.2021.00024

(18) **David M. Cerna**, *Anti-unification and the Theory of Semirings*, Journal of Theoretical Computer Science (TCS), Volume 848, Pages:133-139, Year: 2020, (Scimago 2020: Q2,CS)
DOI: doi.org/10.1016/j.tcs.2020.10.020

(17) **David M. Cerna and Temur Kutsia**, *Higher-Order Linear Pattern Generalization with Unit and other theories*, Mathematical Structures in Computer Science (MSCS), Volume 30, issue 6, Pages 627-663, Year: 2020, (Scimago 2020: Q2, Math)
DOI: doi.org/10.1017/S0960129520000110

(16) **David M. Cerna and Temur Kutsia**, *Idempotent Anti-Unification*, ACM Transactions in Computational Logic (TOCL), Volume 21, issue 2, Pages: 1-32, Year: 2020, (Scimago 2020: Q2, Logic)
DOI: doi.org/10.1145/3359060

(15) **David M. Cerna and Temur Kutsia**, *Unital Anti-Unification: Type and Algorithms*, 5^{th} International Conference on Formal Structures for Computation and Deduction (FSCD 2020), Pages: 26:1-26:20, Year: 2020,(Core 2018: A)
DOI: doi.org/10.4230/LIPIcs.FSCD.2020.26

(14) **Lee P. Barnett, David M. Cerna, Armin Biere**, *Covered Clauses Are Not Propagation Redundant*, 10^{th} International Joint Conference Automated Reasoning (IJCAR 2020), Pages: 32-47, Year: 2020, (Core 2018: A*)
DOI: doi.org/10.1007/978-3-030-51074-9_3

(13) **David M. Cerna, Martina Seidl, Wolfgang Schreiner, Wolfgang Windsteiger, Armin Biere**, *Aiding an Introduction to Formal Reasoning Within a First-Year Logic Course for CS Majors Using a Mobile Self-Study App*, 25^{th} Innovation and Technology in Computer Science Education (ITICSE 2020), Pages: 61-67, Year: 2020, (Core 2018: A)
DOI: doi.org/10.1145/3341525.3387409

(12) **David M. Cerna, Martina Seidl, Wolfgang Schreiner, Wolfgang Windsteiger, Armin Biere**, *Computational Logic in the First Semester of Computer Science: An Experience Report*, 12^{th} International Conference on Computer Supported Education (CSEDU 2020), Pages: 374-381, Year: 2020, (Core 2021: B)
DOI: doi.org/10.5220/0009464403740381

(11) **David M. Cerna and Rafael P.D. Kiesel and Alexandra Dzhiganskaya**, 8^{th} *International Workshop on Theorem proving components for Educational software (ThEdu 2019): Post-Proceedings (EPTCS 313)*, A Mobile Application for Self-Guided Study of Formal Reasoning, Pages: 35-53, Year: 2019, (Unranked)
DOI: doi.org/10.4204/EPTCS.313.3

(10) **David M. Cerna and Temur Kutsia**, *A Generic Framework for Higher-Order Generalizations*, 4^{th} International Conference on Formal Structures for Computation and Deduction (FSCD 2019), Pages: 10:1-10:19, Year: 2019,(Core 2018: A)
DOI: doi.org/10.4230/LIPIcs.FSCD.2019.10

(9) **David M. Cerna and Temur Kutsia**, *Higher-Order Equational Pattern Anti-Unification*, 3^{rd} International Conference on Formal Structures for Computation and Deduction (FSCD 2018), Pages: 12:1-12:17, Year: 2018,(Core 2018: A)
DOI: doi.org/10.4230/LIPIcs.FSCD.2018.12

(8) **David M. Cerna, Alexander Leitsch, Giselle Reis, and Simon Wolfsteiner**, *Ceres in Intuitionistic Logic*, Annals of Pure and Applied Logic (APAL), Volume 168(10), Pages: 1783-1836, Year: 2017,(Scimago 2017: Q1, Logic)
DOI: doi.org/10.1016/j.apal.2017.04.001

(7) **David M. Cerna and Michael Lettmann**, *Integrating a Global Induction Mechanism into a Sequent Calculus*, 26^{th} International Conference on Automated Reasoning with Analytic Tableaux and Related Methods (Tableaux 2017), Pages: 278-294, Year: 2017,(Core 2017: A)
DOI: doi.org/10.1007/978-3-319-66902-1_17

(6) **David M. Cerna and Michael Lettmann**, *Towards a Clausal Analysis of Proof Schemata*, 19^th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC 2017), Pages: 113-120, Year: 2017,(Core 2017: C)
DOI: doi.org/10.1109/SYNASC.2017.00029

(5) **David M. Cerna and Wolfgang Schreiner**, *Measuring the Gap: Algorithmic Approximation Bounds for the Space Complexity of Stream Specifications*, 8^{th} International Symposium on Symbolic Computation in Software Science (SCSS 2017), Pages: 1-15, Year: 2017,(Unranked)
DOI: doi.org/10.29007/t3jg

(4) **David M. Cerna, Wolfgang Schreiner, and Temur Kutsia**, *Predicting Space Requirements for a Stream Monitor Specification Language*, 16^{th} International Conference on Runtime Verification (RV 2016), Pages: 135–151, Year: 2016,(Core 2014: C)
DOI: https://doi.org/10.1007/978-3-319-46982-9_9

(3) **David M. Cerna and Alexander Leitsch**, *Schematic Cut elimination and the Ordered Pigeonhole Principle*, 8^{th} International Joint Conference Automated Reasoning (IJCAR 2016), Pages: 241–256, Year: 2016,(Core 2014: A*)
DOI: https://doi.org/10.1007/978-3-319-40229-1_17

(2) **David M. Cerna, Wolfgang Schreiner, and Temur Kutsia**, *Space Analysis of a Predicate Logic Fragment for the Specification of Stream Monitors*, 7^{th} International Symposium on Symbolic Computation in Software Science (SCSS 2016), Pages: 29–41, Year: 2016, (Unranked)
DOI: https://doi.org/10.29007/jnj2

(1) **David M. Cerna**, *A tableau based decision procedure for multi-parameter propositional schemata*, Conferences on Intelligent Computer Mathematics (CICM 2014), Pages: 61–75, Year: 2014, (Core 2021, C)
DOI: https://doi.org/10.1007/978-3-319-08434-3_6

Preprints & Technical Reports

(5) **David M. Cerna, Andrew Cropper**, *Efficient Rule Induction by Ignoring Pointless Rules*, Arxiv, Pages: 1-10, Year: 2025
DOI: todo

(4) **David M. Cerna**, *A Note On Square-free Sequences and Anti-unification Type*, Arxiv, Pages: 1-4, Year: 2024
DOI: arxiv.org/abs/2412.10307

(3) **David M. Cerna, Julian Parsert**, *One is all you need: Second-order Unification without First-order Variables*, Arxiv, Pages: 1-9, Year: 2024
DOI: arxiv.org/abs/2404.10616

(2) **David M. Cerna**, *Schematic Unification*, Arxiv, Pages: 1-15, Year: 2023
DOI: https://doi.org/10.48550/arXiv.2306.09152

(1) **David M. Cerna**, *Evaluation of the VL Logic (342.208-9) 2018W End of Semester Questionnaire.*, RISC Report, Pages: 1-17, Year: 2019
DOI: www3.risc.jku.at/publications/download/risc_5885/Report.pdf

Software and contributations

Android Application, ***AX****olotl, a logic self-study application*, Developed as part of the LOGTECHEDU Project, aids students through formal proof construction
Webpage: play.google.com/store/apps/dev?id=6871709124320468307
Git Repo: https://github.com/Ermine516/AXolotl

Algorithm Library, *Library of Unification and Anti-Unification Algorithms*, Developed as part of the STOUT and GALA projects lead by Temur Kutsia
Webpage: risc.jku.at/sw/unification-and-anti-unification-algorithm-library/

A001339, A093964, A166105, A244148, A294082, *Sequences related to applications of automated reasoning to proof theory*, https://oeis.org/

TPTP, *Contributed Theorem proving problems to library*, Contributed Problems SYO611-1.p Through SYO634-1.p
http://www.cs.miami.edu/ tptp/TPTP/TR/TPTPTR.shtml

Contributed and Seminar Talks

July 2 2024 **David M. Cerna, Julian Parsert**, *38th International Workshop on Unification* , Talk, One is all you need: Second-order Unification without First-order Variables
lat.inf.tu-dresden.de/unif2024/

July 2 2024 **Gabriela de Souza Ferreira, David M. Cerna, Mauricio Ayala-Rincón and Temur Kutsia**, *38th International Workshop on Unification* , Talk, Computing Generalizers over Intersection and Union Type Theories
lat.inf.tu-dresden.de/unif2024/

July 2 2024 **Andrés Felipe González Barragán, David M. Cerna, Mauricio Ayala-Rincón and Temur Kutsia**, *38th International Workshop on Unification* , Talk, On Anti-Unification over Absorption, Associative, and Commutative Theories
lat.inf.tu-dresden.de/unif2024/

June 26 2024 **David M. Cerna**, *RuleML webinar (Prague University of Economics and Business)*, Talk, Predicate Invention and Inductive Synthesis
github.com/RuleML/ruleml-website/blob/master/talks/README.md

May. 2 2024 **David M. Cerna**, *Prague Automated Reasoning Seminar*, Talk, One is all you need: Second-order Unification without First-order Variables
arg.ciirc.cvut.cz/seminar.html

Apr. 11 2024 **David M. Cerna**, *Cognitive Science Seminar: University of Bamberg*, Talk, Anti-unification: Introduction, Applications, and Recent Results
www.uni-bamberg.de/en/cogsys/studies/courses/colloquium-cognitive-systems/

Nov. 1 2023 **David M. Cerna**, *Dagstuhl Seminar: Approaches and Applications of Inductive Programming*, Abstract, Anti-unification and Generalization: What's next?
www.dagstuhl.de/23442

Oct. 5 2023 **David M. Cerna**, *University of Innsbruck Computer Science Seminar*, Seminar Talk, Cyclic Unification: A Step Towards Cyclic Automated Reasoning
www.uibk.ac.at/informatik/forschung/lunchtime-seminar/index.html.en

July 21 2023 **David M. Cerna**, *Mini-Symposium - Logic Meets Computer Science*, abstract, Anti-Unification and Solution Set Types

May 26 2023 **David M. Cerna**, *University of Gothenberg Logic Group Seminar*, Seminar Talk, Cut-elimination, Schematic Refutations, and Formula Schemata
www.logic-gu.se/seminars

Nov. 12 2022 **David M. Cerna, Alexander Leitsch, Anela Lolic**, *Workshop of the Proof Society*, Abstract, Proof analysis and automated deduction for recursive structures
uswpt.sites.uu.nl/programme/

Sep. 30 2022 **David M. Cerna, Cezary Kaliszyk and Stanislaw Purgal**, *2nd International Joint Conference on Learning & Reasoning (IJCLR)*, Recently Published Track, Learning higher-order logic programs from failures.
ijclr22.doc.ic.ac.uk/program_joint/index.html

Sep. 8 2022 **David M. Cerna, Cezary Kaliszyk and Stanislaw Purgal**, 7^{th} *Conference on Artificial Intelligence and Theorem Proving*, Abstract, Sifting through a large hypothesis space: Revisiting differentiable learning through satisfiability
aitp-conference.org/2022/

Aug. 12 2022 **Chad Brown, David M. Cerna**, 36^{th} *International Workshop on Unification*, Abstract, Higher-Order Unification with Definition by Cases
www.cs.cas.cz/unif-2022/

July 18 2021 **David M. Cerna**, 35^{th} *International Workshop on Unification*, Abstract, When First-order Unification Calls itself
www.uoh.cl/unif-2021/accepted-papers-proceedings

Oct. 24 2019 **David M. Cerna**, *Proof Theory for Automated Deduction, Automated Deduction for Proof Theory*, Abstract, An ordering for flexible and finite representation of infinite sequences of proofs
kgs.logic.at/madeira2019/program

July 26 2019 **David M. Cerna & Anela Lolic**, *Kurt Gödel's Legacy: Does Future lie in the Past?*, Abstract, On Herbrand's Theorem
www.vcla.at/events/kurt-goedels-legacy-does-future-lie-in-the-past/

Apr. 9 2019 **David M. Cerna**, *Artificial Intelligence and Theorem Proving* , Abstract, Towards A New Type of Prover: On the Benefits of Discovering Sequences of "Related" Proofs
aitp-conference.org/2019/

Sep. 7 2018 **David M. Cerna**, *First Workshop of the Proof Society*, Abstract, A Formalism for Proof Transformation in the Presence of Induction
www.proofsociety.org/past/workshop-2018/

July 19 2018 **David M. Cerna**, *Workshop on Proof, Computation, Complexity*, Extended Abstract, Proof Schema and the Refutational Complexity of their Cut Structure
him-application.uni-bonn.de/programs/past-programs/past-trimester-programs/types-sets-constructions/workshop-proof-computation-complexity/

July 8 2018 **David M. Cerna and Michael Lettmann**, *Programming And Reasoning on Infinite Structures*, Abstract, Towards the Automatic Construction of Schematic Proofs
easychair.org/smart-program/FLoC2018/PARIS-program.html

July 7 2018 **David M. Cerna and Temur Kutsia**, *32nd International Workshop on Unification*, Abstract, Towards Generalization Methods for Purely Idempotent Equational Theories
easychair.org/smart-program/FLoC2018/UNIF-program.html

June 2 2018 **David M. Cerna and Temur Kutsia**, *Arbeitstagung Allgemeine Algebra (AAA) 96*, Presentation, Term Generalization for Idempotent Equational Theories
tu-dresden.de/mn/math/algebra/forschung/tagungen/aaaseries/aaa96

Oct. 9 2014 **Conference on Challenges of Identifying Integer Sequences**, *Poster*, Integer Sequences, Recursive Cut Elimination and Combinatorics
archive.dimacs.rutgers.edu/Workshops/OEIS/

Software Projects

June. 2023 – Current **Implementation of Schematic unification Ideas**, *Code for upcoming paper*, Prague, Czechia, Outlined in preprint concerning schematic unification
https://github.com/Ermine516/Schematic-Unification

Sept. 2023 – Feb. 2024 **NOPI ILP System**, *Code for AAAI 2024 paper*, Prague, Czechia, Extension of Popper for learning logic programs with Predicate invention and negation
https://github.com/Ermine516/NOPI

Dec. 2021 – July 2022 **Hopper ILP System**, *Code for IJCAI 2022 paper*, Linz, Austria, Extension of Popper for learning higher-order logic programs
https://github.com/Ermine516/HOpper

June 2019 – Sept.2020 **Project manager and Software Architect**, *AXolotl Android Application*, Linz, Austria, An extended mobile version of AXolotl. Will be used in fist semester course at Johannes Kepler University starting this year
https://play.google.com/store/apps/details?id=org.axolotlLogicSoftware.axolotl

May 2013 – Aug. 2018 **Programmer**, *Generic architecture for proof transformation*, Vienna, Austria
Maintaining and Developing features concerning schematic proof analysis, specification, and formalization

Mar. 2017– jul. 2017 **Programmer**, *Stout*, Hagenberg, Austria
Implementation of anti-unification for associative and commutative hedges

Feb 2015– Mar. 2017 **Programmer**, *LogicGuard*, Hagenberg, Austria
Implementation theoretical results. http://www.risc.jku.at/projects/LogicGuard2/software/

Teaching

Spring 2021–2024 **Assistant Lecturer**, *Formal Methods and Specification*, Czech Technical University Prague, Leading Exercise session, Lectures on Inductive Logic Programming

Oct. 2021 **Guest Lecturer**, *Introduction to Answer Set Programming*, University of Innsbruck, Special lecture on Answer Set Programming

Dec. 2020 **Guest Lecturer**, *Introduction to Mathematical Logic*, Czech Technical University Prague, Special lecture on automated deduction and formalization of mathematics

Winter 2019 **Assistant Lecturer**, *Introduction to Logic*, Johannes Kepler University, Linz, Austria, First semester course on formal reasoning, and problem encoding using SAT and SMT. Approximately 300 students

Spring 2019 **Lecturer**, *Mathematical Logic II*, Johannes Kepler University, Linz, Austria, Selected topics in Mathematical logic such as consistency of Arithmetic as proven by Gentzen

Spring 2018 **Lecturer**, *Arithmetic, Recursion, and Types*, Johannes Kepler University, Linz, Austria, Introduction to fundamental logical calculi, formal arithmetic, basic recursion theorem, Curry-Howard Isomorphisms for simple and polymorphic types

Spring 2016–2017 **Lecturer**, *Practical software technology*, Johannes Kepler University, Linz, Austria, Course topics include the Java programming language, object oriented programming and data structures

Spring 2010 **Teaching Assistant**, *Data Structures and Algorithms*, R.P.I, Troy, New York, USA, Core computer science course on Data Structures and Algorithms. Programming assignments in C++

Winter 2009 **Teaching Assistant**, *Introduction to Artificial Intelligence*, R.P.I, Troy, New York, USA, Elective course introducing artificial intelligence and machine learning

Winter 2008 **Teaching Assistant**, *Network Security I*, R.P.I, Troy, New York, USA, Elective course introducing cryptography and network security