

University Academic Curriculum Vitae

Rafael Peñaloza Nyssen

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University Academic Curriculum Vitae

Personal Information

1 Personal Information

Name: Rafael Peñaloza Nyssen
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Marital status: Married, 1 son
Languages: **Spanish** *Native speaker*
English *C1 level (IELTS Academic 7.5)*
Italian *C1 level*
German *B2 level*

Education Since Leaving School

2 Education Since Leaving School

1999 – 2003

Bachelor Degree in Applied Mathematics, obtained on December 5, 2003 at the *Instituto Tecnológico Autónomo de México (ITAM)*. BSc thesis title: *Knowledge-based Systems, Probabilistic Networks, and KAMET* (supervisors: Prof. Osvaldo Cairó and Prof. Alberto Tubilla Estefan). Final mark 9.31/10 honourary mention (A equivalent).

2003 – 2005

Masters Degree in Computational Logic, obtained on March 15, 2006 at the *Faculty of Computer Science, Technische Universität Dresden*. MSc thesis title: *Optimization of Emptiness Test of Büchi Automata on Infinite Trees* (supervisor: Prof. Franz Baader). Final mark: 1.0 **with distinction** (A+ equivalent).

2006 – 2009

Doctoral Degree (Dr. rer. nat.) in Computer Science, obtained on August 14, 2009 at the *Technische Universität Dresden*. PhD thesis title: *Axiom-Pinpointing in Description Logics and Beyond* (supervisor: Prof. Franz Baader). Awarded with **summa cum laude**.

22/10/2015

German Scientific Habilitation in Computer Science, obtained at the *Faculty of Computer Science, Technische Universität Dresden*. Habilitation thesis title: *Reasoning with Annotated Description Logic Ontologies*.

04/04/2017

Italian Associate Professorship Habilitation in Computer Engineering. Scientific sector: *09/H1 (Sistemi di Elaborazione delle Informazioni)*.

10/04/2017

Italian Associate Professorship Habilitation in Computer Science. Scientific sector: *01/B1 (Informatica)*.

09/09/2019

Italian Full Professorship Habilitation in Computer Engineering. Scientific sector: *09/H1 (Sistemi di Elaborazione delle Informazioni)*.

11/09/2019

Italian Full Professorship Habilitation in Computer Science. Scientific sector: 01/B1 (*Informatica*).

3 Employment and Appointments Held

Present Appointment

3.1 Present Appointment

From 01/03/2019

Associate Professor at the Department of Informatics, Systems and Communication, *University of Milano-Bicocca* (UNIMIB). Scientific Sector: *INF/01 (Informatica)*.

Responsibilities: Research and teaching activity focused on *knowledge representation and reasoning*. Coordination of and participation to European and local research projects. Student supervision. Administrative duties at the faculty level. Management committee member for the Bachelor in Artificial Intelligence

Professional Experience

3.2 Professional Experience

Dec. 2002 – Nov. 2003

Researcher for the *Knowledge Acquisition Methodology Project* (KAMET), funded by CONACYT.¹

Responsibilities: Research activities focused on extending the knowledge acquisition methodology KAMET and its related tools to handle uncertainty. Implementation of prototypes showcasing the results.

Dec. 2003 – Sep. 2004

Analyst at Inffinix Software, a Mexican company developing software applications for managing

financial and user data.

Responsibilities: Development of database applications for managing

financial and user data. Head developer for various automated detection and warning methods for

financial services. Project manager for a new application focused on providing services to large schools.

Oct. 2008 – Dec. 2008

Scientific Researcher working for the project *TONES*, funded by the European Union.

Responsibilities: Research activities focused on the development of non-standard reasoning techniques for expressive ontologies. Help in the preparation of the final project reports.

Jan. 2009 – Mar. 2015

Scientific Researcher at the Faculty of Computer Science of the *Technische Universität Dresden*.

Responsibilities: Research and teaching activities focused on the theoretical aspects of knowledge representation and reasoning. The particular focus was dealing with errors, vagueness, and uncertainty in knowledge. Supervision of Master's theses, and of student research projects. Application, coordination, and management of a research project financed by the German Research Foundation (DFG). Organization of local

¹CONACYT is the Mexican Council for Science and Technology

events. Various administrative duties at the faculty level. Participation in internal, national, and international projects.

Nov. 2011 – Mar. 2015

Associated Member at *Center for Advancing Electronics, Dresden* (cfAED), a multi-disciplinary **cluster of excellence** funded by the German Research Foundation (DFG), the German Federal Government, and the Regional Government of Saxony. Responsibilities: Coordination, and help in the application of the project, from its initial phases. Coordination of the sub-projects in which the chair for Automata Theory was involved, including overview of two post-docs hired for the project. Organisation and submission of progress reports. Research in multi-disciplinary topics, in collaboration with the MPI for cell biology, and the faculties of Electrical Engineering, and Mathematics.

Apr. 2015 – Feb. 2019

Researcher with a fixed-term contract (*RTD Junior*) at the Faculty of Computer Science, *Free University of Bozen-Bolzano* (UNIBZ). Scientific Sector: *INF/01 (Informatica)*.

Responsibilities: Research and teaching activities focused on knowledge representation and reasoning, in particular dealing with knowledge arising from different sources. Coordination of local research projects. Participation in international projects. Student supervision. Various administrative duties at the faculty level.

4 Prizes and Awards

I have received national prizes and best paper awards in recognition of the importance and impact of my research.

4.1 Career Awards

Apr. 23, 2010

Recipient of the **SAP Best Dissertation Award**, awarded by the SAP Research Center Dresden to the best Doctoral Thesis from the Faculty of Computer Science at the Technische Universität Dresden in 2009.

Aug. 2010

Finalist for the **Best Dissertation Award**, awarded by the German Society of Informatics (Gesellschaft für Informatik) to the best German Doctoral Thesis on Computer Science from 2009.

4.2 Other Mentions

- **Finalist** for the Best Paper Award at the 30th German Conference on Artificial Intelligence (KI'07), Osnabrück (Germany), September 2007, for the paper *Pinpointing in the Description Logic EL+*.
- **Runner-up** for the Best Paper Award at the 6th International Conference on Web Reasoning and Rule Systems (RR'12), Vienna (Austria), September 2012, for the paper *A Tableau Algorithm for Fuzzy Description Logics over Residuated De Morgan Lattices*.
- **Shortlisted** for the Best Paper Award at the 14th Extended Semantic Web Conference (ESWC 17), Portoroz (Slovenia), June 2017, for the paper *Lean Kernels in Description Logics*.

5 Experience in Academic Teaching

I have always liked to teach. My first teaching experience came during my second year of Bachelor, where I helped as a trainer for middle-school students that attended the Mathematics Olympics. During my Bachelor and Masters studies, I volunteered time as an assistant in recovery courses for students having trouble passing their logic and programming courses. As soon as I was allowed to teach at the Technische Universität Dresden, I took the opportunity; first as a teaching assistant, and later as lecturer. I have also given tutorials at the University of Calabria, in Cosenza, at Summer Schools, and at other international events. My lectures have covered a wide range of topics, from mathematical foundations to specialized topics in AI. I always consult several sources for preparing each lecture, and keep the material up to date. For me it is fundamental to continuously adapt and improve the lecture notes and slides, and to take into account the medium; an in-person lecture cannot be the same as a telematic one. When deciding the depth, technicality, and scope of my lectures, I always take into account the intended audience and their background, attempting to provide them with the most meaningful content. My passion for teaching is also reflected in my scientific talks, which I curate carefully.

5.1 Courses Given in the Last 5 Years

A.Y. 2016/2017

Lecturer of *Advanced Logic* (8ECTS), Erasmus Mundus European Master in Computational Logic, Free University of Bozen-Bolzano.

A.Y. 2017/2018

Lecturer of *Empirical Methods* (8ECTS), Bachelor in Computer Science, Free University of Bozen-Bolzano.

Lecturer of *Probability Theory and Statistics* (8ECTS), Bachelor in Computer Science, Free University of Bozen-Bolzano.

A.Y. 2018/2019

Lecturer of *Probability Theory and Statistics* (8ECTS), Bachelor in Computer Science, Free University of Bozen-Bolzano.

Laboratory in *Architettura degli Elaboratori* (36 hours), Bachelor in Computer Science, University of Milano-Bicocca.

Exercises in *Programmazione 2* (24 hours), Bachelor in Computer Science, University of Milano-Bicocca.

Lecturer of *Fuzzy Logics for Knowledge Representation* (2 hours), Summer School on Advances in AI

A.Y. 2019/2020

Lecturer of *Fondamenti dell'Informatica* (16 hours lecture, 20 hours exercises), Bachelor in Computer Science, University of Milano-Bicocca.

Lecturer of *Linguaggi di Programmazione* (16 hours lecture, 30 hours laboratory), Bachelor in Computer Science, University of Milano-Bicocca.

Laboratory in *Programmazione 1* (60 hours), Bachelor in Computer Science, University of Milano-Bicocca.

Lecturer of *Razonamiento Probabilístico con Ontologías* (4 hours), International Spring School on Uncertainty in AI and Data Management (UAI@UAI), in Spanish

Lecturer of *Introduction to Probabilistic Ontologies* (3 hours), Reasoning Web Summer School

Lecturer of *Introduction to Probabilistic Ontologies* (3 hours), CILC

A.Y. 2020/2021

Lecturer of *Fondamenti dell'Informatica* (16 hours lecture, 20 hours exercises), Bachelor in Computer Science, University of Milano-Bicocca.

Lecturer of *Linguaggi di Programmazione* (16 hours lecture, 30 hours laboratory), Bachelor in Computer Science, University of Milano-Bicocca.

Laboratory in *Programmazione 1* (60 hours), Bachelor in Computer Science, University of Milano-Bicocca.

5.2 Supervision and Evaluation of Theses

I strongly support collaborative research, and I particularly enjoy working with students and young researchers. Most of the work I have supervised has resulted in publications at internationally renowned venues.

5.2.1 Supervision of PhD Theses

Due to regulations in Germany, during my time in Dresden I was unable to officially supervise PhD theses. Only professors are allowed to do so. However, I worked closely with several PhD students during that time; mainly with Martin Knechtel, Stefan Borgwardt, and İsmail İlkan Ceylan giving them advice and producing joint research papers.

Since Nov. 2019

Co-supervisor of Paolo Tenti on the topic *knowledge-aware embeddings*.

5.2.2 Evaluation of PhD Theses

- 2012 • **External reviewer and member of the examination panel** for the defense of the PhD Thesis *Fuzzy Description Logics from a Mathematical Fuzzy Logic point of view*, by Marco Cerami, Universitat de Barcelona, Spain.
- 2017 • **External reviewer and member of the examination panel** for the defense of the PhD Thesis *General Terminology Induction in Description Logics*, by Viachaslau Sazonau, University of Manchester, UK.
- 2020 • **External reviewer and member of the examination panel** for the defense of the PhD Thesis *Modularity in Belief Change of Description Logic Bases*, by Ricardo Ferreira Guimarães, University of São Paulo, Brazil
 - **Member of the examination panel** for the defense of the PhD Thesis *Neural Networks Enhancement through Prior Logical Knowledge*, by Alessandro Daniele, Università degli Studi di Firenze, Italy
- 2021 • **External reviewer and member of the examination panel** for the defense of the PhD Thesis *Explanations for Ontology-Mediated Query Answers*, by Andrius Vaicenavičius, University of Oxford, UK.
 - **External reviewer** for the PhD Thesis *Large-scale ontology-mediated query answering over OWL 2 RL ontologies*, by Alessio Fiorentino, University of Calabria, Italy

5.2.3 Supervision of Master Theses

- 2007 • **Supervisor** of the MSc thesis by Muhammad Tayyab, European Master in Computational Logic, on *Analysis of Pinpointing Algorithms for the Description Logic \mathcal{ALC}* .
- 2010 • **Supervisor** of the MSc thesis by Mahfuza Farooque, European Master in Computational Logic, on *A Study on Satisfiability in Fuzzy Description Logics*.

- **Supervisor** of the Diploma thesis by Stefan Borgwardt, Diplom in Computer Science,² on *The Infimum Problem as a Generalization of the Inclusion Problem for Automata*. The thesis received the **N.J. Lehmann Award for the best Diploma Thesis in Computer Science and Mathematics**.
- 2011 • **Supervisor** of the MSc thesis by Eldora, European Master in Computational Logic, on *Correcting Access Restrictions: a Range-based Approach*.
- **Supervisor** of the MSc thesis by Weili Fu, European Master in Computational Logic, on *Labeling-extensions of General Tableaux with Many Values*.
- 2013 • **Supervisor** of the MSc thesis by Wenqian Wang, European Master in Computational Logic, on *Error-Tolerant Direct Bases*.
- **Supervisor** of the MSc thesis by José A. Leyva Galano, European Master in Computational Logic, on *The Subsumption Problem for Fuzzy FLO with Greatest Fixed-point Semantics*.
- **Supervisor** of the MSc thesis by İsmail İlkan Ceylan, European Master in Computational Logic, on *Context-Sensitive Bayesian Description Logics*.
- 2015 • **Supervisor** of the MSc thesis by T. Aparna Saisree, European Master in Computational Logic, on *Iterative Ontology Update with Minimum Change*.

5.2.4 Supervision of Bachelor Theses

- 2010 • **Supervisor** of the Großer Beleg³ by Stefan Borgwardt, Diplom in Computer Science, on *Computing Infimum and Supremum of the Behaviour of Weighted Büchi Automata on Labeled Trees*.
- 2011 • **Supervisor** of the Großer Beleg by Karsten Lehmann, Diplom in Computer Science, on *On One-Letter Weighted Buechi Tree Automata*.

5.2.5 Supervision of Research Projects

- 2010 • **Supervisor** of the Master's Research Project by Eldora, European Master in Computational Logic, on *Comparing Ordering Strategies for Boundary Computation*.
- **Supervisor** of the Master's Research Project by Evgeny Sherkhonov, European Master in Computational Logic, on *On Polynomial Representation of the Least Common Subsumer in \mathcal{EL}* .
- **Supervisor** of the Master's Research Project by Weili Fu, European Master in Computational Logic, on *Review of Laconic and Precise Justifications in OWL*.
- 2011 • **Supervisor** of the Master's Research Project by José A. Leyva Galano, European Master in Computational Logic, on *Four Simple-Path Problems in Digraphs and Their Complexity*.
- 2012 • **Supervisor** of the Master's Research Project by Wenqian Wang, European Master in Computational Logic, on *Towards a Completion Algorithm for Fuzzy \mathcal{EL}* .
- **Supervisor** of the Komplexpraktikum by Dorian Merz, Diplom in Computer Science, on *Boundaries in Labelled Ontologies - Uniqueness and Inner Structure*.
- 2013 • **Supervisor** of the Masterspraktikum by Raphael Urmoneit, Masters in Computer Science, on *Finding Best Explanations*.

²Diplom is a 5-year study course equivalent to a Masters degree

³In the Diplom programme, the Großer Beleg is a thesis written after 3 years of study, giving an equivalence to the Bachelor degree.

- **Supervisor** of the Masters Research Project by İsmail İlkan Ceylan, European Master in Computational Logic, on *Bayesian EL: BEL*.
- 2014 • **Supervisor** of the Masters Research Project by T. Aparna Saisree, European Master in Computational Logic, on *Context Labeling and Context-based Reasoning on Semantic Web Ontologies*.
- **Supervisor** of the Masters Research Project by Stathis Delivorias, European Master in Computational Logic, on *Modelling Cellular Automata with Temporal Description Logic*.
- **Supervisor** of the Scientific Project by Lisa Hutschenreiter, Diplom in Computer Science, on *Ground Tableaux and Automata*.
- 2019 • **Supervisor** of the Masters Research Project by Cosimo Damiano Persia, European Master in Computational Logic, on *TBox Repairing*.

**Other
Academic
Responsibilities**

6 Other Academic Responsibilities

I am involved in the organization of top-tier international conferences and other events. I actively participate to the life of the department.

6.1 Institutional Responsibilities

Nov. 2011 – Mar. 2015

Coordinator of the research group on knowledge representation within the Cluster of Excellence “Center for Advancing Electronics Dresden.”

Nov. 2015 – Feb. 2019

Member of the PhD Committee in Computer Science, Free University of Bozen-Bolzano.

Nov. 2020 – Now

Member of the PhD Committee in Computer Science, University of Milano-Bicocca

Jan. 2021 – Now

Member of the Management Committee for the Bachelor in Artificial Intelligence, University of Milano-Bicocca

6.2 Organizational Responsibilities

- 2010 • **Co-chair and organizer** of the First International Workshop on Uncertainty in Description Logics (UniDL-10), Edinburgh, UK.
- 2014 • **Co-chair and organizer** of the First International Workshop on Logics for Reasoning about Preferences, Uncertainty and Vagueness (PRUV 2014), Vienna, Austria.
- 2015 • **Doctoral Consortium Chair** of the 38th German Conference on Artificial Intelligence (KI 2015), Dresden, Germany.
- 2016 • **Co-chair** of the 29th International Workshop of Description Logics (DL 2016), Cape Town, South Africa.
- **Doctoral Consortium Chair** of the 10th International Conference on Web Reasoning and Rule Systems (RR 2016), Aberdeen, UK.
- **Track Co-chair** for the Semantic Web and Conceptual Modelling Track of the 18th IEEE Conference on Business informatics (CBI 2016), Paris, France.

- 2017 • **Track Co-chair** for the Novel Approaches to Ontological Reasoning Track of the 30th International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems, Arras, France.
 - **Co-chair and organizer** of the Debugging and Evaluation Workshop (DEW@JOWO), Bozen-Bolzano, Italy.
- 2018 • **Co-chair and organizer** of the Second International Workshop on Logics for Reasoning about Preferences, Uncertainty and Vagueness (PRUV 2018), Oxford, UK
 - **Co-chair and organizer** of the Bad Ontology Workshop (BOG@JOWO), Cape Town, South Africa
- 2019 • **Co-chair and organizer** of the Bad or Good Ontology Workshop (BOG@JOWO), Graz, Austria
 - **Workshops and Tutorials Chair** of the 18th International Conference of the Italian Association for Artificial Intelligence (AIxIA 19)
 - **Track Co-chair** for the Knowledge Representation and Reasoning Track of the 19th EPIA Conference on Artificial Intelligence (EPIA-19)
- 2020 • **Workshop Co-chair** of the 19th International Conference of the Italian Association for Artificial Intelligence (AIxIA 20)
 - **Local Organizer** of the 14th International Conference on Scalable Uncertainty Management (SUM-2020)
 - **Track Co-chair** for the Knowledge Representation and Reasoning Track of the 20th EPIA Conference on Artificial Intelligence (EPIA-20)
 - **General Co-chair** of the 22nd International Conference on Knowledge Engineering and Knowledge Management (EKAW-20)
- 2021 • **Co-chair** of the 5th International Joint Conference on Rules and Reasoning (RuleML+RR 21)

6.3 Additional Responsibilities and Third Mission

From 2016

Member of the editorial board of *Intelligenza Artificiale*

2016 – 2019

Member of the steering committee of the Description Logic Workshop

2016 – 2019

Series of talks given to industry representatives on Conceptual Modeling, for industries based in the Province of Bozen-Bolzano

From 2019

Member of the editorial board of the *Journal of Artificial Intelligence Research*

From 2021

Editor-in-Chief of *AI Communications*

7 Memberships and Review Activity

I am member of national and international associations, and I am constantly invited to be part of the program committee of top-tier international conferences and national events, as well as to act as a reviewer for world-class international journals and books.

7.1 Membership to Scientific Associations

- *Associazione Italiana per l'Intelligenza Artificiale (AI*IA).*
- *The International Association for Ontology and its Applications (IAOA).*

7.2 Membership to Editorial Boards

Since 03/2016

Member of the Editorial Board for *Intelligenza Artificiale*.

Since 06/2019

Member of the Editorial Board for *Journal of Artificial Intelligence Research*.

Since 01/2021

Editor-in-Chief for *AI Communications*.

7.3 PC Membership at International Conferences and Workshops

7.3.1 Senior PC Membership

- 2013 • 27th AAI Conference on Artificial Intelligence (AAAI-13)
- 2019 • 28th International Joint Conference on Artificial Intelligence (IJCAI-19)
- 2020 • 29th International Joint Conference on Artificial Intelligence (IJCAI-PRICAI-20)
- 2021 • 30th International Joint Conference on Artificial Intelligence (IJCAI-21)
- 18th International Conference on Principles of Knowledge Representation and Reasoning (KR-21) (Area Chair)

7.3.2 PC Membership

- 2011 • 7th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2011)
- 22nd International Joint Conference on Artificial Intelligence (IJCAI'11)
- 24th International Workshop on Description Logics (DL 2011)
- 2012 • First International Workshop on Debugging Ontologies and Ontology Mappings (WoDOOM 2012)
- 8th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2012)
- 6th International Conference on Web Reasoning and Rule Systems (RR 2012)
- 9th Extended Semantic Web Conference (ESWC 2012)
- 25th International Workshop on Description Logics (DL 2012)
- 4th International Workshop on Acquisition, Representation and Reasoning with Contextualized Knowledge (ARCOE'12)
- AI on the Web Workshop 2012
- 2013 • 26th International Workshop on Description Logics (DL 2013)
- Second International Workshop on Debugging Ontologies and Ontology Mappings (WoDOOM 2013)
- 9th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2013)
- 15th Conference of the Spanish Association for Artificial Intelligence (CAEPIA 2013)
- 4th Conference on Knowledge Engineering and Semantic Web (KESW 2013)

- 5th International Workshop on Acquisition, Representation and Reasoning with Contextualized Knowledge (ARCOE'13)
- 2014
- 8th International Conference on Scalable Uncertainty Management (SUM 2014)
 - 5th Conference on Knowledge Engineering and Semantic Web (KESW 2014)
 - 27th International Workshop on Description Logics (DL 2014)
 - Third International Workshop on Debugging Ontologies and Ontology Mappings (WoDOOM 2014)
 - 11th Extended Semantic Web Conference (ESWC 2014)
 - 14th International Conference on Principles of Knowledge Representation and Reasoning (KR 2014)
 - 6th International Workshop on Acquisition, Representation and Reasoning with Contextualized Knowledge (ARCOE'14)
 - 10th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2014)
- 2015
- 24th International Joint Conference on Artificial Intelligence (IJCAI'15)
 - 11th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2015)
 - 6th Conference on Knowledge Engineering and Semantic Web (KESW 2015)
 - First Joint Ontology Workshop (JOWO 2015)
 - 16th Conference of the Spanish Association for Artificial Intelligence (CAEPIA 2015)
 - 4th International Workshop on Debugging Ontologies and Ontology Mappings (WoDOOM 2015)
- 2016
- 12th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2016)
 - 15th International Semantic Web Conference - Posters and Demos (ISWC 2016 P&D)
 - 15th International Conference on Principles of Knowledge Representation and Reasoning (KR 2016)
 - 25th International Joint Conference on Artificial Intelligence (IJCAI'16)
 - International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2016)
 - Tenth International Conference on Scalable Uncertainty Management (SUM 2016)
 - 7th Conference on Knowledge Engineering and Semantic Web (KESW 2016)
 - First International Workshop on Completing and Debugging the Semantic Web (CoDeS'16)
 - V Congreso Español de Informática (CEDI 2016)
 - 22nd European Conference on Artificial Intelligence (ECAI 2016)
- 2017
- 30th International FLAIRS Conference
 - 30th International Workshop on Description Logics (DL 2017)
 - 2nd Workshop on Cognition and Ontologies (CAOS 2017)
 - 14th Extended Semantic Web Conference (ESWC 2017)
 - 26th International Joint Conference on Artificial Intelligence (IJCAI'17)
 - 8th Conference on Knowledge Engineering and Semantic Web (KESW 2017)
 - First International Workshop on Generalizing knowledge: from Machine Learning and Knowledge Representation to the Semantic Web (GenSW2017)
 - 1st International Workshop on Epistemology in Ontologies (EPINON)
 - 16th International Semantic Web Conference (ISWC 2017)

- 16th International Semantic Web Conference - Posters and Demos (ISWC 2017 P&D)
 - 14th Extended Semantic Web Conference - Posters and Demos (ESWC 2017 P&D)
 - Comprehensibility and Explanation in AI and ML (CEx 2017)
 - Workshop on Managing Changes in the Semantic Web (MaCSeW2017)
 - 11th International Conference on Scalable Uncertainty Management (SUM 2017)
 - International Joint Conference on Rules and Reasoning RuleML+RR 2017 Doctoral Consortium
- 2018
- The Bad Ontology Workshop (BOG@JOWO) [PC Chair]
 - 12th International Conference on Scalable Uncertainty Management (SUM 2018)
 - 15th Extended Semantic Web Conference (ESWC 2018)
 - 16th International Conference on Principles of Knowledge Representation and Reasoning (KR 2018)
 - Seminar on Ontology Research in Brazil (ONTOBRAS 2018)
 - 33rd Italian Conference on Computational Logic (CILC 2018)
 - 3rd International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2018)
 - 15th Extended Semantic Web Conference - Posters and Demos (ESWC 2018 P&D)
 - 31st International FLAIRS Conference
 - 27th International Joint Conference on Artificial Intelligence (IJCAI'18)
 - 32nd AAAI Conference on Artificial Intelligence (AAAI'18)
- 2019
- 16th European Conference on Logics in Artificial Intelligence (JELIA'19)
 - 33rd AAAI Conference on Artificial Intelligence (AAAI'19)
 - 4th International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2019)
 - 1st Workshop on Data meets Applied Ontologies in Open Science and Innovation (DAO-SI)
 - XII Seminar on Ontology Research in Brazil (ONTOBRAS 19)
 - 32nd International FLAIRS Conference
 - 42nd German Conference on AI (KI-19)
 - 16th Extended Semantic Web Conference - Posters and Demos (ESWC 2019 P&D)
 - 15th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty (ECSQARU-19)
 - 13th International Conference on Scalable Uncertainty Management (SUM 2019)
 - 18th International Semantic Web Conference (ISWC 2019)
 - 18th International Semantic Web Conference - Posters and Demos (ISWC 2019 P&D)
 - International Joint Conference on Rules and Reasoning RuleML+RR 2019
 - 32nd International Workshop on Description Logics (DL 2019)
- 2020
- 33rd International FLAIRS Conference
 - 24th European Conference on Artificial Intelligence (ECAI 2020)
 - 19th International Conference of the Italian Association for Artificial Intelligence (AIxIA-20)
 - XIII Seminar on Ontology Research in Brazil (ONTOBRAS 20)
 - 5th International Workshop on Ontology Modularity, Contextuality, and Evolution (WOMoCoE 2020)
 - Workshop on Explainable Logic-based Knowledge Representation

- International Joint Conference on Rules and Reasoning RuleML+RR 2020
 - 33rd International Workshop on Description Logics (DL 2020)
 - 19th International Semantic Web Conference (ISWC 2020)
 - 19th International Semantic Web Conference - Posters and Demos (ISWC 2020 P&D)
 - 19th International Semantic Web Conference - Resources (ISWC 2020 Resources)
 - 35th Italian Conference on Computational Logic (CILC 2020)
- 2021
- 34th International FLAIRS Conference
 - 34th International Workshop on Description Logics (DL 2021)
 - 17th European Conference on Logics in Artificial Intelligence (JELIA'21)

7.4 Review Activity

Reviewer for the following international journals:

- ACM Transactions on Computational Logic (ACM TOCL),
- AI-Communications (AIC),
- Advances in Artificial Intelligence (AAIJ),
- Annals of Mathematics and Artificial Intelligence (AMAI),
- Artificial Intelligence Journal (AIJ),
- Data & Knowledge Engineering (DKE),
- Frontiers of Information Technology & Electronic Engineering
- Fundamenta Informaticae (FI)
- Fuzzy Sets and Systems (FSS),
- Information Processing Letters (IPL),
- Information Systems (IS),
- International Journal on Approximate Reasoning (IJAR),
- International Journal on Semantic Web and Information Systems (IJSWIS),
- Journal of Artificial Intelligence Research (JAIR),
- Journal on Automated Reasoning (JAR),
- Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS),
- Journal of Computers (JCP),
- Journal of Logics and Computation (JLC),
- Journal on Web Semantics (JWS),
- Knowledge and Information Systems (KAIS),
- Knowledge-based Systems (KnoSys),
- Künstliche Intelligenz (KI),
- Logical Methods in Computer Science (LMCS),
- Reviews of Symbolic Logic (RSL),
- Semantic Web Journal (SWJ),
- Theory and Practice of Logic Programming (TPLP).

Reviewer for the following international conferences and workshops:

Int. Conf. of the Italian Association for Artificial Intelligence (AI*IA), Int. Joint Conf. on Artificial Intelligence (IJCAI), Int. Joint Conf. on Automated Reasoning (IJCAR), AAAI Conf. on Artificial Intelligence (AAAI), ACM Symp. on Principles of Database Systems (PODS), Int. Conf. on Database Theory (ICDT), European Conf. on Artificial Intelligence (ECAI), European Conf. on Logics in Artificial Intelligence (JELIA), Int. Conf. on Automated Deduction (CADE), Reasoning Web Summer School (RW), Int. Conf. on Logic Programming, Artificial Intelligence, and Reasoning (LPAR), Logical Foundations of Computer Science (LFCS), Global Conf. on Artificial Intelligence (GCAI).

Reviewer for chapters in three volumes of Springer’s Lecture Notes in Computer Science dedicated to uncertainty reasoning for the Semantic Web.

Reviewer for a book published by CRC Press.

Reviewer for chapters on specialized books by CRC Press and Springer.

Reviewer for the American Mathematical Society’s *Mathematical Reviews*.

Research and Scholarships

8 Research and Scholarships

My main research interests fall into the scope of knowledge representation and automated reasoning as a whole, with an emphasis on the theoretical foundations of logic-based knowledge representation languages. In particular, I consider the problem of representing and dealing with incomplete and imperfect knowledge in a precise and unambiguous manner. My interest focuses on being able to automatically reason with the vast amount of knowledge currently available online, or expressed through human (ambiguous) languages.

To achieve these goals, I study several different extensions of classical knowledge representation languages, and novel reasoning services for them. For the former, I consider approaches for dealing with uncertainty (probabilities), vagueness (rough theory), imprecision (fuzzy logic), and preferences (possibilistic logic and total orderings). As novel reasoning services, I mainly focus on methods for understanding the causes for a potentially incorrect piece of information to be derived from a knowledge base, and correcting it if necessary; in addition, I consider new semantics for extracting meaningful information from inconsistent knowledge. Other important problems that I have considered are extracting concepts describing a class of data points, and generalising concepts.

Most of my work is based on understanding and generalising ideas developed in one area, to apply them in another area. For that reason, most of my work considers arbitrary logic-based formalisms as a base, which are then instantiated to Description Logics, a well-known family of knowledge representation languages, as an example application. For that reason, my research has had impact in other communities, with which I continuously collaborate. Being able to communicate with members of other fields has been fundamental for the success of my work.

Although the core of my earlier work was mainly theoretical, in recent years I have also considered the practical aspects of my research. This branch of my work has also provided successful results; the tools implemented with my collaborators are currently among the most efficient available for non-standard reasoning. Moreover, these implementations have helped to verify several of the theoretical complexity results that were previously developed, and motivate new research questions to follow.

I carry my research in collaboration with an extensive network of well-known researchers (see Section 11.6). Currently, I am starting collaborations with members of the University of Milano-Bicocca.

In summary, my research interests are:

- artificial intelligence
- knowledge representation and reasoning
- knowledge acquisition and extraction
- computational logics (temporal/description logics)
- reasoning with uncertainty (probabilistic models, Bayesian networks)
- reasoning about imprecision and vagueness
- conceptual modelling, ontologies, databases

8.1 Research Impact

My scientific output is highly relevant to my community, as witnessed by the high quality (and very competitive) venues in which my research results have been published, by the wide recognition of my research track by the scientific community (see Sections 4 and 11.1), and by the bibliometric indices related to my publication record.

I have co-authored more than 140 peer-reviewed scientific publications, published in world-class referred international journals such as *Artificial Intelligence*, *Journal of Automated Reasoning*, *Information and Computation*, *Journal of Web Semantics*, and *Theory and Practice of Logic Programming*; as well as prestigious and highly selective conferences such as *IJCAI*, *KR*, *AAAI*, *ECAI*, *ICLP*, *ISWC*, and *ESWC*.

According to *Google Scholar*, as of February 3rd, 2021:

- my papers have received **2211 overall citations** (*1165 since 2016*);
- I have have an **h-index**⁴ of **25** (*17 since 2016*);
- I have an **i-10 index**⁵ of **65** (*43 since 2016*).

According to *Scopus*, as of February 3rd, 2021:

- my papers have received **1250 overall citations**;
- I have have an **h-index of 20**.

8.2 Scholarships

- 2006 • *30-month scholarship* for a PhD in Computer Science at the University of Leipzig, Germany, nanced by the German Research Foundation (DFG) as part of the Graduate School on Knowledge Representation

8.3 Research Grants and Projects

Oct. 2008 – Dec. 2008

Team Member for the EU FET Project IST-2005-7603 *Thinking Ontologies (TONES)*. The goal of the project was to study and develop automated reasoning techniques for engineering of and operation with ontologies, and devise methodologies for the deployment of such techniques in advanced tools and applications. The project was coordinated by the Free University of Bozen-Bolzano. The other partners were Sapienza Università di Roma, Italy; The University of Manchester, UK; Technische Universität Dresden, Germany; and Technische Universität Hamburg-Harburg, Germany. The project got a very positive evaluation at its termination.

May 2012 – June 2016

Principal co-Investigator for the German Research Foundation (DFG) Project BA 1122/17-1 *Reasoning in Fuzzy Description Logics with General Concept Inclusion Axioms (FuzzyDL)*. The goal of the project was to understand the complexity of reasoning in different fuzzy extensions of description logics, and develop effective reasoning methods. The project was funded with €174 600.

⁴A researcher has a value of the Hirsch-index (or h-index) equal to h if h of their publications have at least h citations each, while the remaining publications have not more than h citations each. The h-index measures the cumulative impact of the scientific production of a researcher, evaluated by means of the number of citations that their work has obtained.

⁵The i10-index is the number of publications with at least 10 citations.

Nov. 2012 – Mar. 2015

Group Coordinator for the DFG Cluster of Excellence Center for Advancing Electronics Dresden (cfAED). Within this cluster, I was in charge of coordinating the two projects led by the Chair of Automata Theory: Error-Tolerant Reasoning (part of the Resilience Path), and Logical Analysis of Biological Systems (part of the Biological Systems Path).

Nov. 2016 – Feb. 2019

Principal investigator for the UNIBZ Project ORBE: Expressive Bayesian Ontological Reasoning. The main goal of ORBE was to develop efficient reasoning techniques for dealing with uncertain knowledge. A particular focus was given to probabilistic knowledge expressed through a combination of an (expressive) description logic, and a Bayesian network. This project was funded with €70 000 by the Free University of Bozen-Bolzano.

Nov. 2017 – Feb. 2019

Principal investigator for the UNIBZ Project FO2S: From Ontologies to SAT. The main goal of FO2S was to exploit the very efficient tools developed by the SAT community (with specialized data types and novel optimizations) to improve ontological reasoning as a whole. This project is funded with €100 000 by the Free University of Bozen-Bolzano.

Publications 9 Publications

The full list of peer-reviewed publications during the last 10 years is provided at the end of the CV.

Publications About the Applicant 10 Publications About the Applicant

In the press:

- *Wie stelle ich Wissen umfassend dar?* (Dolomiten, Sep. 16, 2015).
- *Ein Geiger ist ein Musiker* (Academia 71, Oct. 2015).

Further Data 11 Further Data

I enjoy presenting the results of my research activity. I often disseminate my research through invited talks, presentations at top-tier international conferences and workshops, seminars, and tutorials, as well as through high-level speeches tailored to the industry and to the general audience. I also actively enhance in the dissemination of scientific knowledge through social media. I particularly write brief articles for scientific dissemination in Spanish.

11.1 Invited Talks and Keynotes

Feb. 21, 2014

Invited talk at the 35th Linz Seminar on Fuzzy Set Theory, Linz (Austria). Title: *Automata-based Reasoning in Fuzzy Description Logics*.

Dec. 11, 2015

Invited talk at ManyVal 2015, Les Diablerets (Switzerland). Title: *Feeding Many Values to Light-weight Description Logics*.

Nov. 3, 2016

Invited talk at the 25èmes Rencontres Francophones sur la Logique Floue et ses Applications, La Rochelle (France). Title: *The Status of Fuzzy Description Logic Reasoning*.

11.2 Presentations at International Conferences and Workshops

- 06-11-2003 Presentation at the 23rd International Conference of the Chilean Computer Science Society (SCCC 2003), Chillan (Chile). Title: *Using Bayesian Networks as an Inference Engine in KAMET*.
- 13-11-2003 Presentation at the X Conference of the Spanish Society of Artificial Intelligence (CAEPIA-03), Donostia-San Sebastian (Spain). Title: *Creating a Bayesian inference engine for KAMET*.
- 09-06-2007 Presentation at the 2007 International Workshop on Description Logics (DL2007), Brixen-Bressanone (Italy). Title: *Pinpointing in the Description Logic EL*.
- 03-07-2007 Presentation at the 16th International Conference on Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX 2007), Aix en Provence (France). Title: *Axiom Pinpointing in General Tableaux*.
- 11-09-2007 Presentation at the 30th Annual German Conference on AI (KI 2007), Osnabrück (Germany) Title: *Pinpointing in the Description Logic EL+*.
- 16-05-2008 Presentation at the 21st International Workshop on Description Logics (DL2008), Dresden(Germany). Title: *Automata-based Pinpointing for DLs*.
- 14-08-2008 Presentation at the 4th International Joint Conference on Automated Reasoning (IJCAR 2008), Sydney (Australia). Title: *Automata-Based Axiom Pinpointing*.
- 06-07-2009 Presentation at the TABLEAUX 2009 Workshop on Tableaux versus Automata as Logical Decision Methods (AutoTab'09), Oslo (Norway). Title: *Using Tableaux and Automata for Pinpointing in EL*
- 27-07-2009 Presentation at the 22nd International Workshop on Description Logics (DL 2009), Oxford (UK). Title: *Reasoning With Weighted Ontologies*
- 28-07-2009 Presentation at the 22nd International Workshop on Description Logics (DL 2009), Oxford (UK). Title: *Axiom Pinpointing is Hard*
- 05-05-2010 Presentation at the 23rd International Workshop on Description Logics (DL 2010), Waterloo (Canada). Title: *Correcting Access Restrictions to a Consequence*.
- 07-05-2010 Presentation at the 23rd International Workshop on Description Logics (DL 2010), Waterloo (Canada). Title: *Complexity of Axiom Pinpointing in the DL-Lite Family*.
- 11-05-2010 Presentation at the Twelfth International Conference on Principles of Knowledge Representation and Reasoning (KR 2010), Toronto, (Canada). Title: *On the Complexity of Axiom Pinpointing in the EL Family of Description Logics*
- 26-05-2010 Presentation at the 4th International Conference on Language and Automata Theory and Applications (LATA 2010), Trier (Germany). Title: *Using Sums-of-Products for Non-standard Reasoning*
- 20-07-2010 Presentation at the First International Workshop on Uncertainty in Description Logics (UniDL 10), Edinburgh (UK). Title: *Towards Approximative Most Specific Concepts by Completion for EL with Subjective Probabilities*

- 28-06-2011 Presentation at the 2011 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2011), Taipei (Taiwan). Title: *Are fuzzy description logics with general concept inclusion axioms decidable?*
- 13-07-2011 Presentation at the 24th International Workshop on Description Logics (DL 2011), Barcelona (Spain). Title: *GCI's Make Reasoning in Fuzzy DL with the Product T-norm Undecidable*
- 15-07-2011 Presentation at the 24th International Workshop on Description Logics (DL 2011), Barcelona (Spain). Title: *Correcting Access Restrictions to a Consequence More Flexibly*
- 20-07-2011 Presentation at the 22nd International Joint Conference on Artificial Intelligence (IJCAI 2011), Barcelona (Spain). Title: *Description Logics over Lattices with Multi-Valued Ontologies*
- 06-10-2011 Presentation at the 8th International Symposium Frontiers of Combining Systems (FroCoS 2011), Saarbrücken (Germany). Title: *On the Undecidability of Fuzzy Description Logics with GCIs and Product T-norm*
- 23-10-2011 Presentation at the 7th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2011), Bonn (Germany). Title: *Finite Lattices Do Not Make Reasoning in ALCI Harder*
- 02-06-2012 Presentation at the 6th International Workshop on Weighted Automata: Theory and Applications (WATA 2012), Dresden (Germany). Title: *The complexity of computing the behaviour of weighted Büchi automata over lattices*
- 08-06-2012 Presentation at the 25th International Workshop on Description Logics (DL 2012), Rome (Italy). Title: *Adding Context to Tableaux for DLs*
- 12-06-2012 Presentation at the 13th International Conference on Principles of Knowledge Representation and Reasoning (KR 2012), Rome (Italy). Title: *Undecidability of Fuzzy Description Logics*
- 10-09-2012 Presentation at the 6th International Conference on Web Reasoning and Rule Systems (RR 2012), Vienna (Austria). Title: *A Tableau Algorithm for Fuzzy Description Logics over Residuated De Morgan Lattices*
- 24-07-2013 Presentation at the 26th International Workshop on Description Logics (DL 2013), Ulm (Germany). Title: *Rough EL Classification*
- 20-09-2013 Presentation at the 9th International Symposium on Frontiers of Combining Systems (FroCoS 2013), Nancy (France). Title: *Roughening the EL Envelope*
- 12-06-2014 Presentation at the 12th International Conference on Formal Concept Analysis (ICFCA'14) Cluj-Napoca (Romania). Title: *Classifying software bug reports using methods from formal concept analysis*
- 19-07-2014 Presentation at the 27th International Workshop on Description Logics (DL 2014), Vienna (Austria). Title: *Brave and Cautious Reasoning in EL*
- 20-07-2014 Presentation at the 7th International Joint Conference on Automated Reasoning (IJCAR 2014), Vienna (Austria). Title: *The Bayesian Description Logic BEL*
- 23-07-2014 Presentation at the First Workshop on Logics for Reasoning about Preferences, Uncertainty, and Vagueness, (PRUV 2014), Vienna (Austria). Title: *Many-valued Horn Logic is Hard*
- 24-09-2014 Presentation at the 14th European Conference on Logics in Artificial Intelligence (JELIA 2014), Madeira (Portugal). Title: *The Fuzzy Description Logic G-FLO with Greatest Fixed-Point Semantics*

- 24-09-2014 Presentation at the 14th European Conference on Logics in Artificial Intelligence (JELIA 2014), Madeira (Portugal). Title: *Error-Tolerant Reasoning in the Description Logic EL*
- 28-07-2015 Presentation at the 24th International Conference on Artificial Intelligence (IJCAI 2015), Buenos Aires (Argentina). Title: *The Complexity of Subsumption in Fuzzy EL*
- 27-07-2015 Presentation at the Workshop on Belief Change and Nonmonotonic Reasoning in Ontologies and Databases (OntoChange), Buenos Aires (Argentina). Title: *Iterative Ontology Updates Using Context Labels*
- 22-04-2016 Presentation at the 29th International Workshop on Description Logics (DL 2016). Cape Town (South Africa). Title: *Reasoning in Expressive Gödel Description Logics*
- 23-04-2016 Presentation at the 29th International Workshop on Description Logics (DL 2016). Cape Town (South Africa). Title: *Efficient Axiom Pinpointing in EL using SAT Technology*
- 09-11-2016 Presentation at the 15th European Conference On Logics In Artificial Intelligence (JELIA 2016), Larnaka (Cyprus). Title: *Efficient Reasoning for Inconsistent Horn Formulae*
- 30-05-2017 Presentation at the 14th International ESWC Conference (ESWC 2017), Portoroz (Slovenia). Title: *Lean Kernels in Description Logics*
- 28-06-2017 Presentation at the 25th Italian Symposium on Advanced Database Systems (SEBD 2017), Squillace Lido (Italy). Title: *A Decidable Very Expressive n-ary Description Logic for Database Applications*
- 13-07-2017 Presentation at the 1st International Joint Conference on Rules and Reasoning (RuleML+RR 2017), London (UK). Title: *Inconsistency-tolerant Instance Checking in Tractable Description Logics*
- 18-07-2017 Presentation at the 30th International Workshop on Description Logics (DL 2017), Montpellier (France). Title: *Debugging EL+ Ontologies through MUS Enumeration*
- 18-07-2017 Presentation at the 30th International Workshop on Description Logics (DL 2017), Montpellier (France). Title: *Lukasiewicz Fuzzy EL is Undecidable*
- 19-07-2017 Presentation at the 30th International Workshop on Description Logics (DL 2017), Montpellier (France). Title: *Lean Kernels in Description Logics*
- 04-10-2018 Presentation at the 12th International Conference on Scalable Uncertainty Management (SUM 2018), Milano (Italy). Title: *Consequence-Based Axiom Pinpointing*
- 09-05-2019 Presentation at the 16th European Conference on Logics in Artificial Intelligence (JELIA 2019), Cosenza (Italy). Title: *A Bayesian Extension of the Description Logic ALC*
- 06-09-2019 Presentation at the 16th International Conference on Modeling Decisions for Artificial Intelligence (MDAI-19). Title: *Making Decisions with Knowledge Base Repairs*
- 29-06-2020 Presentation at the 4th International Joint Conference on Rules and Reasoning (RuleML+RR 2020). Title: *Query Answering in Fuzzy DL-Lite with Graded Axioms*
- 13-09-2020 Presentation at the 33rd International Workshop on Description Logics (DL 2020). Title: *Query Answering in Fuzzy DL-Lite with Graded Axioms*

15-09-2020 Presentation at the 17th International Conference on Principles of Knowledge Representation and Reasoning (KR 2020). Title: *Towards a Logic of Meta-Analysis*

11.3 Seminars and Tutorials

May 10, 2012

Opening QuantLA Research Seminar, Technische Universität Dresden (Germany).
Title: Fuzzy DL Nation.

Oct. 15, 2012

Seminar on Non-classical Logics, University of Barcelona (Spain). Title: Finding the Culprits - A True Mystery Tale.

Mar. 25-29, 2013

Tutorial at the Department of Mathematics and Computer Science, Università della Calabria (Italy). Title: Introduction to Fuzzy Description Logics. (10 hours).

Feb. 15, 2015

Invited Seminar at the Chair of Polymeric Microsystems, Technische Universität Dresden (Germany). Title: Fuzzy Logic: A Primer.

Jan. 20-29, 2016

Tutorial at the Department of Mathematics and Computer Science, Università della Calabria (Italy). Title: Introduction to Fuzzy Description Logics. (10 hours).

Mar. 2, 2017

Lunch Seminar, Free University of Bozen-Bolzano (Italy). Title: We know more than we claim.

May 4, 2017

Invited Seminar at the University of Manchester (UK). Title: The Context-based View on Non-standard Reasoning.

Oct. 5, 2017

Invited tutorial at the 11th International Conference on Scalable Uncertainty Management (SUM 2017). Title: Fuzzy Description Logics. (2 hours).

11.4 Industry Talks and Talks to the General Audience

Sep. 20, 2016

Presentation at the **Look&Touch** event, organized by the Free University of Bozen-Bolzano for TTControl Title of the presentation: Description Logics and Ontologies.

Jan. 16, 2017

Presentation at the **Look&Touch** event, organized by the Free University of Bozen-Bolzano for GKN Title of the presentation: Conceptual Modelling.

Mar. 13, 2017

Presentation at the **Look&Touch** event, organized by the Free University of Bozen-Bolzano for Brennercom Title of the presentation: Conceptual Modelling.

Mar. 28, 2017

Presentation at the **Look&Touch** event, organized by the Free University of Bozen-Bolzano for Systems Srl Title of the presentation: Conceptual Modelling.

Sep. 28, 2019

Presentation at **Meet-me-Tonight**, organized by the University of Milano-Bicocca Title of the presentation: The Knowledge Game.

11.5 Invitations at international events

10/2012 Dagstuhl Seminar 12441 *Foundations and Challenges of Change and Evolution in Ontologies*.

11.6 Main Research Collaborations

- F. Baader, S. Borgward (Technische Universität Dresden). Topics: Knowledge representation and reasoning, vagueness, Fuzzy Description Logic.
- J. Marques-Silva (University of Lisbon), C. Mencía (University of Oviedo). Topics: Knowledge base debugging, supplemental reasoning problems.
- T. Lukasiewicz, I.I. Ceylan (University of Oxford). Topics: Reasoning about uncertainty and preferences
- M. Montali, F.M. Maggi (Free University of Bozen-Bolzano). Topics: Business Process Modelling, probabilistic temporal logics
- O. Kutz, N. Troquard (Free University of Bozen-Bolzano). Topics: Concept invention, justifications, generalizations

Language Competences

12 Language Competences

Spanish *Native speaker*
English *C1 level (IELTS Academic 7.5)*
Italian *C1 level*
German *B2 level*

Publications

- [1] Erman Acar and Rafael Peñaloza. Reasoning with contextual knowledge and influence diagrams. In Diego Calvanese, Esra Erdem, and Michael Thielscher, editors, *Proceedings of the 17th International Conference on Principles of Knowledge Representation and Reasoning, KR 2020, Rhodes, Greece, September 12-18, 2020*, pages 12–21, 2020.
- [2] Franz Baader, Francesco Kriegel, Adrian Nuradiansyah, and Rafael Peñaloza. Computing compliant anonymisations of quantified aboxes w.r.t. *EL* policies. In Jeff Z. Pan, Valentina A. M. Tamma, Claudia d’Amato, Krzysztof Janowicz, Bo Fu, Axel Polleres, Oshani Seneviratne, and Lalana Kagal, editors, *The Semantic Web - ISWC 2020 - 19th International Semantic Web Conference, Athens, Greece, November 2-6, 2020, Proceedings, Part I*, volume 12506 of *Lecture Notes in Computer Science*, pages 3–20. Springer, 2020.
- [3] Camille Bourgaux, Ana Ozaki, Rafael Peñaloza, and Livia Predoiu. Provenance for the description logic *elhr* (extended abstract). In Stefan Borgwardt and Thomas Meyer, editors, *Proceedings of the 33rd International Workshop on Description Logics (DL 2020) co-located with the 17th International Conference on Principles of Knowledge Representation and Reasoning (KR 2020), Online Event [Rhodes, Greece], September 12th to 14th, 2020*, volume 2663 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2020.
- [4] Camille Bourgaux, Ana Ozaki, Rafael Peñaloza, and Livia Predoiu. Provenance for the description logic *elhr*. In Christian Bessiere, editor, *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI 2020*, pages 1862–1869. ijcai.org, 2020.
- [5] Fabrizio Maria Maggi, Marco Montali, Rafael Peñaloza, and Anti Alman. Extending temporal business constraints with uncertainty. In Dirk Fahland, Chiara Ghidini, Jörg Becker, and Marlon Dumas, editors, *Business Process Management - 18th International Conference, BPM 2020, Seville, Spain, September 13-18, 2020, Proceedings*, volume 12168 of *Lecture Notes in Computer Science*, pages 35–54. Springer, 2020.
- [6] Fabrizio Maria Maggi, Marco Montali, and Rafael Peñaloza. Probabilistic conformance checking based on declarative process models. In Nicolas Herbaut and Marcello La Rosa, editors, *Advanced Information Systems Engineering - CAiSE Forum 2020, Grenoble, France, June 8-12, 2020, Proceedings*, volume 386 of *Lecture Notes in Business Information Processing*, pages 86–99. Springer, 2020.
- [7] Fabrizio Maria Maggi, Marco Montali, and Rafael Peñaloza. Temporal logics over finite traces with uncertainty. In *The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2020, The Thirty-Second Innovative Applications of Artificial Intelligence Conference, IAAI 2020, The Tenth AAAI Symposium on Educational Advances in Artificial Intelligence, EAAI 2020, New York, NY, USA, February 7-12, 2020*, pages 10218–10225. AAAI Press, 2020.
- [8] Norbert Manthey, Rafael Peñaloza, and Sebastian Rudolph. Satpin: Axiom pinpointing for lightweight description logics through incremental SAT. *Künstliche Intell.*, 34(3):389–394, 2020.
- [9] Gabriella Pasi and Rafael Peñaloza. Query answering in fuzzy dl-lite with graded axioms (extended abstract). In Stefan Borgwardt and Thomas Meyer, editors, *Proceedings of the 33rd International Workshop on Description Logics (DL 2020) co-located with the 17th International Conference on Principles of Knowledge Representation and Reasoning (KR 2020), Online Event [Rhodes, Greece], September 12th to 14th, 2020*, volume 2663 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2020.
- [10] Gabriella Pasi and Rafael Peñaloza. Query answering in fuzzy dl-lite with graded axioms. In Víctor Gutiérrez-Basulto, Tomás Kliegr, Ahmet Soylu, Martin Giese, and Dumitru Roman,

- editors, *Rules and Reasoning - 4th International Joint Conference, RuleML+RR 2020, Oslo, Norway, June 29 - July 1, 2020, Proceedings*, volume 12173 of *Lecture Notes in Computer Science*, pages 39–53. Springer, 2020.
- [11] Rafael Peñaloza. Error-tolerance and error management in lightweight description logics. *Künstliche Intell.*, 34(4):491–500, 2020.
- [12] Rafael Peñaloza. Introduction to probabilistic ontologies (tutorial). In Francesco Calimeri, Simona Perri, and Ester Zumpano, editors, *Proceedings of the 35th Italian Conference on Computational Logic - CILC 2020, Rende, Italy, October 13-15, 2020*, volume 2710 of *CEUR Workshop Proceedings*, page 4. CEUR-WS.org, 2020.
- [13] Rafael Peñaloza. Introduction to probabilistic ontologies. In Marco Manna and Andreas Pieris, editors, *Reasoning Web. Declarative Artificial Intelligence - 16th International Summer School 2020, Oslo, Norway, June 24-26, 2020, Tutorial Lectures*, volume 12258 of *Lecture Notes in Computer Science*, pages 1–35. Springer, 2020.
- [14] Rafael Peñaloza. Towards a logic of meta-analysis. In Diego Calvanese, Esra Erdem, and Michael Thielscher, editors, *Proceedings of the 17th International Conference on Principles of Knowledge Representation and Reasoning, KR 2020, Rhodes, Greece, September 12-18, 2020*, pages 672–676, 2020.
- [15] Erman Acar, Rafael Peñaloza, and Livia Predoiu. Making decisions over contextual ontologies. In Mantas Simkus and Grant E. Weddell, editors, *Proceedings of the 32nd International Workshop on Description Logics, Oslo, Norway, June 18-21, 2019*, volume 2373 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2019.
- [16] Alessandro Botti Benevides, Jean-Rémi Bourguet, Giancarlo Guizzardi, Rafael Peñaloza, and João Paulo A. Almeida. Representing a reference foundational ontology of events in SROIQ. *Appl. Ontology*, 14(3):293–334, 2019.
- [17] Leonard Botha, Thomas Meyer, and Rafael Peñaloza. A bayesian extension of the description logic \mathcal{ALC} . In Francesco Calimeri, Nicola Leone, and Marco Manna, editors, *Logics in Artificial Intelligence - 16th European Conference, JELIA 2019, Rende, Italy, May 7-11, 2019, Proceedings*, volume 11468 of *Lecture Notes in Computer Science*, pages 339–354. Springer, 2019.
- [18] Diego Calvanese, Davide Lanti, Ana Ozaki, Rafael Peñaloza, and Guohui Xiao. Enriching ontology-based data access with provenance. In Sarit Kraus, editor, *Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China, August 10-16, 2019*, pages 1616–1623. ijcai.org, 2019.
- [19] Maria M. Hedblom, Oliver Kutz, Rafael Peñaloza, and Giancarlo Guizzardi. Image schema combinations and complex events. *Künstliche Intell.*, 33(3):279–291, 2019.
- [20] Rafael Peñaloza. Explaining axiom pinpointing. In Carsten Lutz, Uli Sattler, Cesare Tinelli, Anni-Yasmin Turhan, and Frank Wolter, editors, *Description Logic, Theory Combination, and All That - Essays Dedicated to Franz Baader on the Occasion of His 60th Birthday*, volume 11560 of *Lecture Notes in Computer Science*, pages 475–496. Springer, 2019.
- [21] Rafael Peñaloza. Making decisions with knowledge base repairs. In Vicenç Torra, Yasuo Narukawa, Gabriella Pasi, and Marco Viviani, editors, *Modeling Decisions for Artificial Intelligence - 16th International Conference, MDAI 2019, Milan, Italy, September 4-6, 2019, Proceedings*, volume 11676 of *Lecture Notes in Computer Science*, pages 259–271. Springer, 2019.
- [22] Stefano Borgo, Oliver Kutz, Frank Loebe, Fabian Neuhaus, Kemo Adrian, Mihailo Antovic, Valerio Basile, Martin Boeker, Diego Calvanese, Tommaso Caselli, Giorgio Colombo, Roberto

- Confalonieri, Laura Daniele, Jérôme Euzenat, Antony Galton, Dagmar Gromann, Maria M. Hedblom, Heinrich Herre, Inge Hinterwaldner, Andrea Janes, Ludger Jansen, Kris Krois, Antonio Lieto, Claudio Masolo, Rafael Peñaloza, Daniele Porello, Daniele Paolo Radicioni, Emilio M. Sanfilippo, Daniel Schober, Rossella Stufano, and Amanda Vizedom, editors. *Proceedings of the Joint Ontology Workshops 2017 Episode 3: The Tyrolean Autumn of Ontology, Bozen-Bolzano, Italy, September 21-23, 2017*, volume 2050 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2018.
- [23] Thomas Lukasiewicz, Rafael Peñaloza, and Anni-Yasmin Turhan, editors. *Proceedings of the Second Workshop on Logics for Reasoning about Preferences, Uncertainty, and Vagueness co-located with the 9th International Joint Conference on Automated Reasoning, PRUV@IJCAR 2018, Oxford, UK, July 19th, 2018*, volume 2157 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2018.
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