Curriculum Vitae et Studiorum

Roberto Confalonieri

November 2024

Short Bio

Roberto Confalonieri is Associate Professor (Senior Lecturer) of Computer Science at the Department of Mathematics 'Tullio Levi-Civita' of the University of Padua, Italy. Prior to that, he was an Assistant Professor (Lecturer) at the Faculty of Computer Science of the Free University of Bozen-Bolzano. He received a Ph.D. in Artificial Intelligence (with distinction) from the Polytechnic University of Catalonia in 2011. In 2018-2020 he was eXplainable AI team lead at Alpha, the first European Moonshot projects company funded by Telefonica Research in Barcelona. In 2017-2018, he was project manager and researcher of the Smart Data Factory, the technology transfer centre of the Faculty of Computer Science of of the Free University of Bozen-Bolzano, where he acquired and directed several research projects and collaborations with industries raising a total amount of €1.810.188 in two years. In 2011-2016 he was post-doctoral researcher in several research institutions in Europe (UPC BarcelonaTech, IRIT, Goldsmiths College, IIIA-CSIC, Universitat of Barcelona).

He has published more than 60 peer-reviewed scientific publications, published in world-class referred international AI conferences (IJCAI, AAAI, ECAI) and journals (AIJ, EAAI, AMAI). He co-edited the book 'Concept Invention' published by Springer in 2018. He is Senior Editor of the Cognitive Systems Research journal published by Elsevier and Associate Editor of the Neurosymbolic Artificial Intelligence Journal (IOS Press). He was an editor of the special issue on 'The Role of Ontologies and Knowledge in Explainable AI' to be published in the Semantic Web Journal published (IOS Press), and is editing a special issue series 'On the Cognitive Side of Explainable AI' to be published in the Cognitive Systems Research journal (Elsevier) and a special issue of NeSy 2024 extended papers to be published in the Neurosymbolic AI journal (IOS Press).

He regularly organises scientific events: he chaired the series of international workshops of Data meets Applied Ontologies (DAO @JOWO 2017, DAO-SI @JOWO 2019, DAO-XAI @ DL2021). He was local and doctoral consortium chair of the 13th International Conference on Computational Creativity (ICCC 2022). He organised the 6th Workshop on Advances In Argumentation In Artificial Intelligence (AI3 2022), an event associated with the 21st International Conference of the Italian Association for Artificial Intelligence (AIxIA 2022). He regularly serves as Senior PC and PC member in top-tier AI conference such as IJCAI, AAAI, and ECAI, and as a reviewer for a number of journals on AI and ML.

In 2020-2022, he was the PI of the 'Hyperspectral images for inspection applications (H2I)' project, an EFRE/FESR funded project (FESR1111) coordinated by the Faculty of Computer Science of the Free University of Bozen-Bolzano and carried out in collaboration with industries. The project was focused on the use of deep learning models for the automatic identification of wood and fruit defects and for sustainable management of goods. In his career, he participated in 4 European projects, and in dozens of unibz research projects and collaborations with industries. He is currently the PI of the project "Neurosymbolic Explainable AI" and WP leader of the project "*Symbolic conditioning of Graph Generative Models*" (SymboliG).

His main research topics are in AI, particularly Trustworthy and Explainable AI, Knowledge Representation and Applied Ontologies, and Computational Creativity, particularly Concept Invention, Concept Evaluation, and Concept Refinement.

Web page: `https://www.math.unipd.it/~rconfalonieri/`

Contents

University Academic Curriculum Vitae

Personal Information

1 Personal Information

Name:	Roberto Confalonieri
Place of birth:	Bologna (Italy)
Nationality:	Italian
Present Appointment:	Associate Professor (INF0-01/A)
University:	Università degli Studi di Padova
Department:	Department of Mathematics 'Tullio Levi Civita'
Telephone:	Office: +39-049 827 1353
Email:	roberto.confalonieri@unipd.it
Web:	https://www.math.unipd.it/~rconfalonieri/

Education Since Leaving School

2 Education Since Leaving School

University (1997–2005): Faculty of Computer Science, Università degli Studi di Bologna; degree in Computer Science 106/110, March 2005.
Thesis: *Un'ontologia per l'orchestrazione di servizi Web semantici*
Supervisors: Prof. Mauro Gaspari and Dr. John Domingue (KMI, Open University, UK).

Ph.D. (2007–2011): in Artificial Intelligence at the Computer Science Department, Polytechnic University of Catalonia, Spain; homologated to the italian degree of 'Dottore di Ricerca' in 2015.
Thesis: *The Role of Preferences in Logic Programming: Nonmonotonic Reasoning, User Preferences, Decision under Uncertainty*;
Supervisors: Dr. Javier Vázquez-Salceda and Dr. Juan Carlos Nieves;
External reviewers: Prof. Gerhard Brewka (University of Leipzig), Prof. Francesca Toni (Imperial College London), Prof. Lluis Godo Lacasa (IIIA-CSIC), and Prof. Stefan Woltran (DBAI TU Wien).

Master degree (2012–2013): Institute of Education Sciences, Polytechnic University of Catalonia, Spain; master degree in Vocational Training and Language Teaching, 9/10; homologated to the Italian TFA in 2020 for the sector: A41 - Informatica.
Thesis: *L'Scratch com a suport educatiu d'introducciò a la programaciò en la classe de matemàtiques*;
Supervisor: Prof. Maria Rosa Massa Esteve (University of Barcelona).

Catalan National Habilitation (Feb. 2013): Tenure-track lecturer in the scientific sector *Engineering and Architecture*, AQU Catalunya, Spain.

Catalan National Habilitation (Nov. 2020): Associate professor in the scientific sector *Engineering and Architecture*, AQU Catalunya, Spain.

Italian National Habilitation (13-Nov. 2020–13-Nov. 2029): Professore II Fascia (associate professor) in the scientific sector *09/H1 (Information Processing Systems)*.

Italian National Habilitation (23-Nov. 2020–23-Nov. 2029): Professore II Fascia (associate professor) in the scientific sector *01/B1 (Computer Science)*.

Spanish National Habilitation - ANECA (04-Mar. 2024–): Profesor Titular de Universidad (associate professor) in the scientific sector *Engineering and Architecture*, ANECA, Spain.

Italian National Habilitation (19-Nov. 2024–19-Nov. 2035): Professore I Fascia (full professor) in the scientific sector *09/H1 (Information Processing Systems)*.

3 Employment and Appointments Held

Present Appointment

3.1 Present Appointment

Since Sept. 2022: *Associate Professor* (tenured) at the Department of Mathematics 'Tullio Levi-Civita' of the University of Padua, Italy. Scientific Sector: *INF/01 (Informatica)*

Responsibilities: – research in the area of Explainable and Trustworthy AI; – research in the area of Deep Learning for Computer Vision and Hyperspectral images; and decision support systems in application domain such as precision agriculture; – teaching and student supervision; – project administration and participation in European, and local research projects;

Since Sep. 2016: *Lecturer* in the Master of Research in Artificial Intelligence - Universidad Internacional Menendez Pelayo, Spain.
Responsibilities: – teaching 'Answer Set Programming' in the module 'Razonamiento automatico' (online, in spanish); – master's students supervision.

Professional Experience

3.2 Professional Experience

Jun. 2004 – Feb. 2005: *Research Intern*, Knowledge Media Institute (KMI), Open University, Milton Keynes, UK.
Responsibilities: – research in the area of semantic Web services; – extension of a Java- and LISP-based reasoning service platform (IRS-III) for the orchestration of semantic Web services according to an orchestration ontology (work carried out for the M.Sc. in Computer Science degree).

Jun. 2005 – Dec. 2005: *Junior Analyst Programmer* at Tele Sistemi Ferroviari (TSF), Bologna, Italy.
Responsibilities: development in .NET of a Web application for the intelligent scheduling of the rail traffic in the Italian rail infrastructure.

Jan. 2006 – Dec. 2006: *Research Assistant* at 'Dipartimento di Scienze Economiche', Università degli Studi di Bologna, Italy.
Responsibilities: technical manager and main programmer of the Rebag-Ware, a system that allows users to rate public works online and to indirectly evaluate firms and public organisations about the fulfilment of their obligations to help fighting governance's corruption.

Jan. 2007 – Dec. 2011: *Research Assistant and Ph.D. Student* in the KEMLg research group at at the Computer Science Department, Polytechnic University of Catalonia, Spain.
Responsibilities: – research in the area of multi-agents systems in the context of the European projects IST-CONTRACT and ICT-ALIVE; – design and development of a multi-agent middleware architecture for building contract-aware Web services; – design and development of a logic programming-based formalism for user profile representation in context-aware recommender systems; – teaching and students supervision.

Oct. 2011 – Sep. 2012: *Post-doctoral Researcher* at Institut de Recherche en Informatique de Toulouse, University of Toulouse, France.
Responsibilities: – research on agreement technologies, argumentation, and multiple-criteria decision making in the context of the European project ACE; – development of a personal assistant agent architecture, and of a lightweight peer-to-peer Electronic Institution infrastructure.

Nov. 2012 – Ag. 2013: *Post-doctoral Researcher* at the Computing Department of Goldsmiths College, University of London, UK.
Responsibilities: – research on agreement technologies, argumentation, and multiple-criteria decision making in the context of the European project ACE; – development of a personal assistant agent architecture, and of a lightweight peer-to-peer Electronic Institution infrastructure.

Nov. 2013 – Sep. 2016: *Post-doctoral Researcher* at Artificial Intelligence Research Institute of the Spanish Council for Scientific Research (IIIA-CSIC), Bellaterra, Spain.
Responsibilities: – technology transfer of the results developed in the European project ACE, that is, a distributed agent-based platform for developing applications enhanced with social intelligence; – CEO and CTO of SocialBrowsing, a spin-off of the IIIA-CSIC; – research in the area of cognitive AI, computational creativity, concept invention in the

European project COINVENT; – development of a cognitive-based computational creativity system that aims at assisting humans in creative tasks such as music harmonisation and mathematics.

Oct. 2016 – Dec. 2016: *R&D Engineer*. NaradaRobotics, S.L., Barcelona, Spain.
Responsibilities: – integration of machine learning algorithms (for classification of real-time speeches) into Web applications; – design and development of a Web astrology application.

Oct. 2016 – Dec. 2016: *Adjunct Professor*. University of Barcelona, Spain.
Responsibilities: teaching and supervision of students in the B.Sc. of Computer Science Engineering.

Jan. 2017 – Oct. 2019: *Researcher with a fixed-term contract* (RTDa - research) and scientific collaborator of the Smart Data Factory (NOI TechPark), the technology transfer lab of the Faculty of Computer Science of the Free University of Bozen-Bolzano (UniBZ), Italy. Scientific Sector: *ING-INF/05 (Sistemi di Elaborazione delle Informazioni)*.
Responsibilities: – creation of the first instance of the Smart Data Factory at the NOI TechPark. – third mission activities, especially industry-oriented, for the Faculty of Computer Science of UniBZ; – applied research activity and technology transfer within the projects acquired at the Smart Data Factory. – research in the areas of cognitive AI, concept invention and coherence, argumentation.

Oct. 2018 – Dec. 2019: *XAI Team Lead and Senior Research Scientist in AI* at Telefónica Innovación Alpha SL - Health Moonshot project, Barcelona, Spain.
Responsibilities: – research scientist lead of the Explainable AI team; – coordination and management with other teams within Alpha (research, design, product, data engineering, and engineering); – applied research in the area of Explainable AI, especially focusing on how to integrate common-sense knowledge (e.g., ontologies) into machine learning algorithms and how to extract human understandable explanations from black-box (e.g., NNs) models.

Jan. 2020 – Aug. 2022: *Assistant professor - Researcher with a fixed-term contract* (RTDa) at the Faculty of Computer Science of the Free University of Bozen-Bolzano (UniBZ), Italy. Scientific Sector: *INF/01 (Informatica)*
Responsibilities: – research in the area of Explainable and Trustworthy AI; – research in the area of Deep Learning for Computer Vision and Hyperspectral images; and decision support systems in application domain such as precision agriculture; – teaching and student supervision; – project administration and participation in European, and local research projects;

Research and Scholarship

4 Research and Scholarship

Roberto received his Ph.D. in Artificial Intelligence (with distinction) from the Polytechnic University of Catalonia (2011) with a thesis on 'The Role of Preferences in Logic Programming: Non-monotonic Reasoning, User Preferences and Decision Making under Uncertainty'. He has worked both in industry and in academia, as R&D engineer, assistant professor, and post-doctoral researcher in several research institutions in Europe (UPC, UB, IRIT, Goldsmiths College, IIIA-CSIC). He has collaborated with major experts in non-classical logic, ontologies, and multi-agent systems. He has participated in several European projects (IST-CONTRACT, ICT-ALIVE, ACE, COINVENT), and a number of R&D projects with industries, and university projects. In 2020-2022, he was the Principal Investigator of the H2I project, a research project on computer vision in collaboration with a local industry in South-Tyrol.

4.1 Summary of Current Research

A major focus of Roberto's current work is on Explainable and Trustworthy AI [JI-9, JI-10, CI-33, CI-34, WI-13, JI-11], specifically on knowledge-based approaches to explaining machine learning black-box models with an emphasis on the challenging problem to bridging the gap between

symbolic and non-symbolic reasoning. He particularly focuses on the role played by ontologies to enhance human understandability of explanations approximating black-box models [CI-31, TR-4], and how ontologies can support the adaptation of explanations to different user profiles. He is also interested in the design and implementation of practical tools for interpretable ML and explainable recommender systems. He is the principal designer and programmer of TREPAN RELOADED, a model-agnostic approach for the explanation of black-box classifiers enhanced by explicit knowledge (see also *UniNews*: "Cosa si nasconde dietro gli algoritmi? Lo scopre Trepan Reloaded'). He co-designed and co-implemented RECOXPLAINER, a library for the development and evaluation of explainable Recommender Systems that was presented at AAAI 21 in a tutorial session (see also `https://www.math.unipd.it/~rconfalonieri/aaai21/`), and recently accepted as journal publication in the IEEE Computational Intelligence Magazine [JI-11].

A more recent topic of research is on hyper-spectral images. This research is carried out in the context of the 'H2I project' (see `https://h2i.inf.unibz.it`). Hyper-spectral images extend classical 3-bands images (e.g., RGB) with spectral information, that is, a whole spectrum of new bands that are captured by specific cameras. The main problem is how to deal with the spectral information for image classification tasks, and how to exploit this information for image classification [CI-32]. The aim is to develop a holistic deep learning framework able to deal with hyper-spectral images classification, and to study explanation techniques for deep learning networks, in particular, in relation to the classification of hyper-spectral images.

Roberto is also interested in cognitive AI, more specifically in logical approaches to model core notions that are understood to be involved in human concept formation and invention [CI-23, JI-7] such as coherence, argumentation and concept refinement [CI-22, CI-24, WI-5, WI-8, WI-9]. He is particularly interested in concept invention and refinement [JI-7, JI-6, JI-8] and in ontology repair [CI-26, CI-27, CI-28].

4.2 Previous Research

Roberto's previous research activity can be classified into three main areas: knowledge representation for preferences and uncertainty, socio-technical multi-agent systems, and computational approaches to creativity.

His research on knowledge representation for preferences and uncertainty focused on formal approaches to reasoning under incomplete and uncertain information, user preferences, and decision making under uncertainty, with emphasis on Answer Set Programming (ASP). He proposed several theoretical frameworks that extended the standard ASP syntax and semantics to deal with preferences and qualitative uncertainty [JI-3, CI-6, CI-7, CI-8], nested preferences [JI-1, WI-3], decision making under uncertainty [JI-2, JI-4, CI-9], and flexible preference queries to uncertain databases [JI-3, CI-11, CI-12]. He engineered a number of frameworks into proof-of-concept prototypes that have been applied in applications such as context-aware recommendation systems [CI-12, CI-10].

His research on socio-technical multi-agent systems was mainly concerned in using agent technology, such as Electronic Institutions and agreement technologies, e.g., argumentation and multi-criteria decision making, to develop multi-user interactive systems [JI-5, BC-3, CI-19, CI-18, CI-14, CI-15, CI-13].

More recently, his research was on computational approaches of concept invention and creativity [B-4, BC-1, BC-2], in particular, on the formalisation and implementation of a cognitive theory of creativity based on conceptual blending for modelling human creativity [JI-7, CI-20, CI-23]. This theory was applied both as analytical tool and invention tool in the music domain, e.g., to reproduce and invent chords progression and cadences [CI-21, CI-24].

4.3 Research Impact

During his career, Roberto has published more than 60 peer-reviewed articles in major international journals and conferences in AI. He published in top conferences (IJCAI, AAAI, ECAI) along with reputable journals (AMAI, JAI, IJAR, EAAI). He co-edited the book 'Concept Invention: Foundations, Implementation, Social Aspects and Applications' published by Springer in 2018.

According to Google scholar, his **h-index** is **19**, and he got **2134 citations** (Nov. 2024).

According to Scopus, his **h-index** is **14**, and he got **1119 citations** (Nov. 2024).

4.4 Research Visits

Jun. 2004 – Feb. 2005: Visit to the *Knowledge Media Institute*, Open University in Milton Keynes, UK, to carry out research on the orchestration of semantic Web services in collaboration with Dr. John Domingue (as part of the M.Sc. in Computer Science thesis).

Oct. 2010 – Feb. 2011: Visit to the *Institute de Recherche en Informatique de Toulouse*, Toulouse (France), to carry out research on the combination of Answer Set Programming and Possibilistic Logic in collaboration with Dr. Henri Prade.

May. 2022: Visiting Researcher at the *Department of Informatics*, University of Bergen, Norway, to carry out research on probabilistic guarantees to explanations of black box models, in collaboration with Prof. Ana Ozaki.

Jan. 2023: Visiting Researcher at the *Programming Theory Group*, University of Bergen, Norway, to carry out research on probabilistic guarantees to explanations of black box models, in collaboration with Prof. Ana Ozaki.

Aug. 2023: Visiting Researcher at the *Analytical Solutions and Reasoning (ASR) research group*, Department of Informatics, University of Oslo, Norway, to carry out research on probabilistic guarantees to explanations of black box models, in collaboration with Prof. Ana Ozaki.

Jun. 2023 – Sept. 2023: Visiting Professor at the *Knowledge Engineering and Machine Learning Group (KEMLg)*, Universitat Politècnica de Catalunya, BarcelonaTech, Barcelona (Spain), to carry out research on explanations in multi-agent systems in collaboration with Prof. Javier Vazquez-Salceda.

Jun. 2024 – Jul. 2023: Visiting Research Scientist at the *Artificial Intelligence Research Institute (IIIA-CSIC)*, Bellaterra, Barcelona (Spain), to carry out research on explanations in and cognitive AI in collaboration with Dr. Marco Schorlemmer.

5 Coordination and Participation in Research Projects

Roberto has participated in a number of European projects, projects with the industry, and internal university projects. He participated in the writing of grant proposals of projects awarded by a total amount of €1.840.188 (ROBUSINTER, PACMEL, REUSE, STORE, ALPINEANNOTATION, ONCONET2, PRO4, COCO, CREED, SECO, ONTORATOR, STELLA, HULA, TEKE, NeurXAI, HIPPA).

He is the PI of the EFRE-FESR project 'H2I: Hyper-spectral Images for Inspection Application'. The project is carried out with Microtec, a world-leading South-Tyrolean company of wood technologies. The goal of the project is the development of a holistic framework for the classification of hyperspectral images, and the design of Deep Learning solutions for the analysis of hyperspectral images to support detection of defects in woods and fruits.

The following table reports a summary of the research projects that I have acquired since I took service at the Free University of Bozen-Bolzano (UniBZ), and in which I have been involved as Acquirer (Acquis), Acquirer and Coordinator (Coord), or as a principal investigator (PI). The projects are grouped according to the funding body. For the externally funded projects, both the total funding and the funding acquired for UniBZ are reported.

A more detailed description of the projects listed in the above table is reported in the following.

5.1 Publicly Funded Competitive Projects

Sep. 2006 – Sep. 2009: IST-CONTRACT: *Contract-based Systems Engineering Methods for Verifiable Cross-Organisational Networked Business Applications.* The goal of the project was to develop frameworks, components and tools for contract-based e-Business systems.
Role: Research Assistant and Ph.D. Student
Funding body: European Commission, funded under FP6
Funding amount: €2.481.864

Project	Funding body	Duration from – to	mths	Role	Funding (in €) Total	UniBZ
H2I	EFRE-FESR	01/2019 – 03/2022	39	PI	502 743	201 879
PACMEL	EU CHIST-ERA	03/2019 – 02/2021	24	Acquis	346 445	125 160
ROBUSINTER	EFRE-FESR	02/2019 – 06/2022	40	Acquis	1 113 068	317 150
HIPPA	EFRE-FESR	12/2023 – ongoing	36	Acquis	660 183	314 531
COCO	CRC - UniBZ	10/2017 – 10/2019	24	Acquis		70 000
CREED	RTD - UniBZ	10/2017 – 10/2019	24	Acquis		10 000
SECO	CRC - UniBZ	11/2017 – 04/2021	42	Acquis		58 000
ONTORATOR	RTD - UniBZ	10/2018 – 12/2021	38	Acquis		10 000
STELLA	CRC - UniBZ	01/2018 – 06/2021	42	Acquis		100 000
HULA	RTD - UniBZ	12/2020 – 12/2022	24	PI		9 675
TEKE	RTD - UniBZ	12/2021 – 05/2023	18	Co-PI		30 000
NeurXAI	BIRD - UniPD	10/2023 – 10/2025	24	PI		15 000
CLASS	Private	03/2018 – 08/2018	6	Coord		4 000
REUSE	Private	08/2018 – 09/2019	2	Coord		2 000
STORE	Private	08/2018 – 09/2018	2	Coord		3 000
PRO4	Private	09/2018 – 12/2020	28	Coord		10 000
ONCONET2	Private	07/2018 – 03/2020	21	Coord		25 000
ALPINE	Private	12/2018 – 06/2020	18	Acquis		39 000
Total funding acquired by the candidate for UniBZ						**989 889**
Total funding acquired by the candidate						**1 855 188**

Project number: IST-FP6-034418
Adopted technologies/competences: Agreement technologies, multi-agent systems
Coordinator: Prof. Ulises Cortés (UPC)
Partners: 3scale Networks S.L.; University of Prague (Check Republic); Fujitsu Enabling Software Technology (Germany); Imperial College London (UK); Kings College London (UK); Universitat Politècnica de Catalunya – UPC (Spain).

Feb. 2008 – Oct. 2010: ICT-ALIVE: *Coordination, Organisation and Model-Driven Approaches for Dynamic, Flexible, Robust Software and Services Engineering.* The goal of the project was to develop frameworks, components and tools for the coordination and organisation of agent-based Web services.
Role: Research Assistant and Ph.D. Student
Funding body: European Commission, funded under FP7
Funding amount: €3.777.385
Project number: ICT-FP7-215890
Adopted technologies/competences: Multi-agent systems, engineering
Coordinator: Dr. Javier Vázquez-Salceda (UPC)
Partners: Tech Media Telecom Factory S.L. (Spain), Thales Nederland B.V. (The Netherlands); University of Aberdeen (UK), University of Utrecht (The Netherlands); University of Bath (UK); Universitat Politècnica de Catalunya – UPC (Spain).

Sep. 2011 – Aug. 2013: ACE: *Autonomic software engineering for online Cultural Experiences.* The goal of the project was about exploiting the predominance of social networking using autonomic software agents to enrich, encourage and enliven engagement with online cultural artefacts such as from a museum or a gallery.
Role: Post-doctoral researcher
Funding body: European Commission, funded under the FP7 ERA-Net funding scheme (CHIST-ERA 2010)
Funding amount: €625.500
Project number: CHRI-001-03
Adopted technologies/competences: Agreement technologies, argumentation, decision making
Coordinator: Prof. Carles Sierra (IIIA-CSIC)

Partners: Artificial Intelligence Research Institute - IIIA-CSIC (Spain); Goldsmiths' College (UK); Toulouse Institute of Computer Science Research - IRIT-CNRS (France).

Oct. 2013 – Sep. 2016: COINVENT: *Concept Invention Theory.* The goal of the project was to develop a computational feasible conceptualisation of the conceptual blending theory, a cognitive theory modeling human creativity.
Role: Post-doctoral researcher
Funding body: European Commission, funded under ICT STREP
Funding amount: €2.715.786
Project number: 611553
Adopted technologies/competences: Ontology, computational creativity
Coordinator: Dr. Marco Schorlemmer (IIIA-CSIC)
Partners: Aristotle University of Thessaloniki (Grece); Free University of Bolzano-Bozen (Italy); Artificial Intelligence Research Institute / IIIA-CSIC (Spain); Otto-von-Guericke-Universität Magdeburg (Germany); The University of Edinburgh (UK); University of Dundee (UK); University of Osnabrück (Germany).

Mar. 2019 – Feb. 2021: PACMEL: *Process-aware Analytics Support based on Conceptual Models for Event Logs.* The goal of the project is to develop a process-aware analytic framework for analysing data from sensors and devices for the purpose of process modeling, analysis, and improvement.
Role: Acquisition
Funding body: European Commission, funded under the ERA-Net funding scheme (CHIST-ERA 2017)
Funding amount: €346.445
Adopted technologies/competences: Ontology-based data access and integration, process mining
Coordinator: Prof. Grzegorz J. Nalepa (AGH)
Partners: AGH University of Science and Technology (Poland), Universidad Autonoma de Madrid (Spain), Free University of Bozen-Bolzano (Italy).

Jan. 2019 – Jan. 2022: ROBUSINTER: *Optimisation of the robustness of compression presses in powder metallurgy through adaptive press control.* The goal of the project is to develop techniques to automatically adjust compression presses' parameters during the sintering of metal pieces.
Role: Acquisition
Funding body: EFRE/FESR 2017 research project
Funding amount: €1.113.068,26
Adopted technologies/competences: Machine learning
Coordinator: Prof. Angelika Peer (UniBZ)
Partners: GKN Sinter Metals S.p.A. (Italy); Free University of Bozen-Bolzano – UniBZ (Italy)

Jan. 2019 – Mar. 2022: H2I: *Immagini iper-spettrali per l'ispezione del legno e della frutta.* The goal of the project is to design new solutions for the acquisition and analysis of hyperspectral images to support detection of defects and of maturation states of wood and fruit.
Role: Principal Investigator (PI)
Funding body: EFRE/FESR 2017 research project
Funding amount: €502.742,58
Adopted technologies/competences: Computer Vision, Deep learning

Partners: PP Microtec srl. (Italy); Free University of Bozen-Bolzano – UniBZ (Italy)

Dec. 2023 – Dec. 2026: HIPPA: *Imaging iperspettrale per l'individuazione di danni fisiologici e parassitari sui frutti di melo in fase di raccolta e post-raccolta* The goal of the project is to design new solutions for the detection of physiological and parasitic damage on apple fruits at harvest and post-harvest stage using hyperspectral images.

Role: External collaborator
Funding body: EFRE/FESR 2021-2027 research project
Funding amount: €660.183,55
Adopted technologies/competences: Computer Vision, Hyperspectral imaging, Precision Agriculture
Project number: I53C23001650007
Coordinator: Prof. Sanja Baric (UniBZ)
Partners: Eurac Research; Microtec srl. (Italy); Laimburg Research Center (Italy); Free University of Bozen-Bolzano – UniBZ (Italy)

Apr. 2024 – Oct. 2025: SymboliG: *Symbolic conditioning of Graph Generative Models* The goal of the project is to bridge the gap between graph generative models and the neuro-symbolic integration of logical constraints..
Role: WP leader
Funding body: NextGeneration-EU - Future Artificial Intelligence (FAIR) research project
Funding amount: €223.488,00
Adopted technologies/competences: Graph Generative Models, Diffusion Models, Weighted Logic Constraints, Explainability, Incremental learning
Project number: PE0000013, CUP C63C22000770006
Coordinator: Prof. Nicolò Navarin (UniPD)
Partners: University of Padova – UniPD (Italy)

5.2 Commissioned Research Collaborations with Industries

Commissioned research collaboration with industries were acquired, managed, and executed in the context of the Smart Data Factory, the technology transfer lab of the Faculty of Computer Science of UniBZ. In less than two years Roberto was able to acquire two European projects (ROBUSINTER and PACMEL), and a number of commissioned research contracts.

Jul. 2018 – Sep. 2018: CLASS: The goal of the project was the creation of a data repository and of a set of dashboards for data visualisation regarding the study of social determinants for health and life expectancy in the province of Bolzano.
Role: Acquisition and Project Management
Funding body: Free University of Bozen-Bolzano - Faculty of Education
Funding amount: €4.000
Adopted technologies/competences: Data analytics and data visualisation tools
Coordinator: Prof. Diego Calvanese (UniBZ)
Partners: University of Rome – Faculty of Statistics (Italy); Free University of Bozen-Bolzano – UniBZ (Italy).

Aug. 2018 – Sep. 2018: REUSE: The goal of the project was to run a a study for understanding the spread of "best practices" in Open Source projects that are found on GitHub.
Role: Acquisition and Project Management
Funding body: NOI AG – Commissioned Research
Funding amount: €2.000
Adopted technologies/competences: Open-source development, software engineering
Coordinator: Prof. Barbara Russo (UniBZ)
Partners: NOI AG (Italy); Free University of Bozen-Bolzano – UniBZ (Italy).

Aug. 2018 – Sep. 2018: STORE: The goal of the project was to carry out a study and a systematic mapping of the open data repositories of South Tyrol, with the aim of identifying data sets that are available for different application sectors (mobility, tourism, etc.), with the respective data providers and data formats.
Role: Acquisition and Project Management
Funding body: NOI AG – Commissioned Research
Funding amount: €3.000

Adopted technologies/competences: Open data standards, linked open data, literature review
Coordinator: Prof. Diego Calvanese (UniBZ)
Partners: NOI AG (Italy); Free University of Bozen-Bolzano – UniBZ (Italy).

Sept. 2018 – Dec. 2020: PRO4: *Provisioning 4.0.* The goal of the project is to design and develop a decision model in the context of an intelligent warehouse able to predict the depletion of stocks of products and generate suggestions on the most effective processing of order to be made, while satisfying a number of functional objectives.
Role: Acquisition and Project Management
Funding body: Datatellers S.r.L. – Commissioned Research
Funding amount: €10.000
Adopted technologies/competences: Machine learning, decision making
Coordinator: Prof. Francesco Ricci (UniBZ)
Partners: Datatellers S.r.L. (Italy); Free University of Bozen-Bolzano – UniBZ (Italy).

Jul. 2018 – Mar. 2020: ONCONET2: *Modular platform for the "Simultaneous Care" territorial management of cancer patients.* The goal of the project is to develop a proof of concept for a model of functional and clinical retrieval recommendations based on clinical histories of patients, for the purpose of assisting clinical experts in their decision making.
Role: Acquisition, Project Management, and Research
Funding body: EDP Progetti S.r.L. – Commissioned Research
Funding amount: €25.000
Adopted technologies/competences: Machine learning, interface design, recommender systems
Coordinator: Prof. Markus Zanker (UniBZ)
Partners: EDP Progetti S.r.L. (Italy); Free University of Bozen-Bolzano – UniBZ (Italy).

Dec. 2018 – Jun. 2020: ALPINEANNOTATION: *A Lightweight Data format and Proof-of-concept for INtErchanging culturAl eveNts aNd ski-resOrT informATION.* The goal of the project is to develop an open standard (schema) for the representation and description of information on cultural events and ski-resorts, and of a developer-kit (consisting of a client and a server) for exchanging and testing data about events and ski-resort information by means of a set of APIs.
Role: Acquisition
Funding body: NOI AG – Commissioned Research
Funding amount: €39.000
Adopted technologies/competences: Ontology languages, ontology engineering
Coordinator: Prof. Giancarlo Guizzardi (UniBZ)
Partners: NOI AG (Italy); Free University of Bozen-Bolzano – UniBZ (Italy)

5.3 University Research Projects

Sep. 2016 – Sep. 2018: COCO: *Computational Technologies for Concept Invention.* The goal of the project was to integrate agreement technologies, such as argumentation and coherence, with ontologies to build computational models of concept invention.
Role: Acquisition and Research
Funding body: Free University of Bozen-Bolzano - CRC Call 2016
Funding amount: €70.000
Adopted technologies/competences: Cognitive AI, Ontologies, Computational Creativity
Coordinator: Dr. Oliver Kutz (UniBZ).

Oct. 2017 – Oct. 2019: CREED: *Coherence and Explanation.* The goal of the project was to develop a philosophical understanding and a formal definition of the concept of explanation of Artificial Intelligence and Machine Learning based technology.
Role: Acquisition and Research.
Funding body: Free University of Bozen-Bolzano - RTD Call 2017

Funding amount: €10.000
Adopted technologies/competences: Argumentation, Coherence, Explainability
Coordinator: Dr. Daniele Porello (UniBZ).

Nov. 2017 – Apr. 2021: SECO: *Social Evaluation of Concepts*. The goal of the project was to help consolidate UNIBZ's position as one of the key European players in the evaluation of computational ontologies.
Role: Acquisition and Research.
Funding body: Free University of Bozen-Bolzano - CRC Call 2017
Funding amount: €58.000
Adopted technologies/competences: Argumentation, Coherence, Explainability
Coordinator: Dr. Daniele Porello (UniBZ).

Oct. 2018 – Dec. 2020: ONTORATOR: *Automated Ontology Generator*. The goal of the project was to develop a methodology for the generation of ontology for debugging purposes.
Role: Acquisition and Research
Funding body: Free University of Bozen-Bolzano - RTD Call 2018
Funding amount: €10.000
Adopted technologies/competences: Ontologies
Coordinator: Dr. Oliver Kutz (UniBZ).

Jan. 2018 – Jun. 2021: STELLA: *Spatio-temporal Logics for Cognitive Artificial Intelligence*. The goal of the project was to initiate a systematic study into the formal logical modelling of the building blocks of human conceptual thinking, focusing on the deeply interlinked notions of affordance and image schema.
Role: Acquisition and Research
Funding body: Free University of Bozen-Bolzano - CRC Call 2018
Funding amount: €100.000
Adopted technologies/competences: Cognitive AI, Ontologies
Coordinator: Prof. Alessandro Artale (UniBZ).

Jan. 2017 – Dec. 2022: SMART DATA FACTORY: The Smart Data Factory (SDF) lab promotes technology transfer of the competences and technologies that are available at the Faculty of Computer Science to companies and organisations operating in the private, public, and third sectors.
Role: Technology Transfer Manager and Researcher
Funding body: Free University of Bozen-Bolzano
Adopted technologies/competences: Capacity building, technology transfer
Coordinator: Prof. Diego Calvanese (Free University of Bozen-Bolzano).

Dec. 2020 – Dec. 2022: HULA: *Human-centric Explainable AI*. The goal of the project is to design new solutions for neural-symbolic learning and reasoning, to devise explanations of black-box machine learning models.
Role: Principal Investigator
Funding body: Free University of Bozen-Bolzano - RTD Research Call 2020
Funding amount: 9.675 €
Adopted technologies/competences: Explainable AI
Coordinator: Dr. Roberto Confalonieri (Free University of Bozen-Bolzano).

Dec. 2020 – Dec. 2022: TEKE: *Threshold Expressions for Knowledge Representation and Explanation of Models*. The goal of the project is to explain black box models through tooth operators, and explore their human-understandability.
Role: Co-I
Funding body: Free University of Bozen-Bolzano - RTD Research Call 2021
Funding amount: 30.000 €
Adopted technologies/competences: Explainable AI, Knowledge Representation and Reasoning
Coordinator: Dr. Pietro Galliani (Free University of Bozen-Bolzano).

Oct. 2023 – Oct. 2025: NeurXAI: *Neuro-symbolic Explainable AI*. The goal of the project is to explain black box models through a neuro-symbolic approach.

Role: PI
Funding body: University of Padua, Department of Mathematics - BIRD project call 2023
Funding amount: 15.000 €
Adopted technologies/competences: Explainable AI, Knowledge Representation and Reasoning
Coordinator: Prof. Roberto Confalonieri (University of Padua).

Awards

6 Awards

Roberto was awarded with **four best paper awards** (one at ECAI 2020), and a technology transfer award. He organised a number of scientific events: he co-chaired the series of International Workshops of Methods for Interpretation of Industrial Event Logs (co-located with IDEAL 2018 and BPM 2019), of Data meets Applied Ontologies (in JOWO 2017 and JOWO 2019), and of Computational Creativity, Concept Invention, and General Intelligence (C3GI 2018). He participates in a number of programme committees of top-tier AI conferences both as a Senior PC and PC member (IJCAI, AAAI, ECAI).

He organised the 3rd International Workshop on Data meets Applied Ontologies in eXplainable AI (DAO-XAI 2021). He was the local chair and doctoral consortium chair of the 13th International Conference on Computational Creativity (ICCC 2022), held in Bolzano in June 2022.

Nov. 2013: *Best Paper in Session Award*, session on 'Cognitive Architectures and Multi-Agent Systems'
Awarded by: the Annual Conference of the IEEE Industrial Electronics Society, IECON 2013
For the paper: N. Osman, M. d'Inverno, C. Sierra, L. Amgoud, H. Prade, M. Yee-King, *R. Confalonieri*, D. de Jonge, K. Hazelden. *An experience-based BDI logic: motivating shared experiences and intentionality.* In Proceedings of the 39th Annual Conference of the IEEE Industrial Electronics Society (IECON 2013), pp. 6654–6659. IEEE, November 2013.

Mar. 2014: *2nd Place for Best Business Plan for 'SocialBrowsing'* in the 3rd edition of the VALORTEC contest.
Awarded by: ACCIÓ10 the agency for competitiveness of Catalan companies of the Department of Enterprise and Employment.
The contest: The 3rd edition saw about 50 proposals from which the jury chose 10 finalists. The finalists received a training program of 25 hours in order to prepare a business plan and to present it to exploitation technology specialists. The jury consisted of representatives of ACCIÓ, CINC Center, Arvor Consulting, EAE Business School, IESE, Rousaud Costas Duran and Office Ponti. We were selected as 2nd best business plan and we received a prize in cash of €2.000. `https://tinyurl.com/ul2csbe`

Jul. 2016: *Best Paper Award*
Awarded by: Association for Computational Creativity.
For the paper: M. Kaliakatsos-Papakostas, *R. Confalonieri*, J. Corneli, A. Zacharakis, E. Cambouropoulos. *An Argument-based Creative Assistant for Harmonic Blending.* In Proceedings of the 7th International Conference on Computational Creativity (ICCC 2016), pp. 330–337, July 2016. `http://www.computationalcreativity.net/iccc2016/best-paper-award/`

Sept. 2020: *Distinguished Paper Award*
Awarded by: ECAI 2020 PC Chair (Giuseppe De Giacomo) and General Chair (Jérôme Lang)
For the paper: *R. Confalonieri*, T. Weyde, T. R. Besold, F. Moscoso del Prado Martín. *Trepan Reloaded: A Knowledge-driven Approach to Explaining Black-box Models.* In Proceedings of the 24th European Conference on Artificial Intelligence (ECAI 2020), pp. 2457–2464, 2020. `https://digital.ecai2020.eu/hall-of-fame-2/`

Sept. 2022: *Nominee for Best Paper Award*
Awarded by: EKAW 2022 PC Chairs (Sponsored by AIJ)

For the paper: G. Righetti, D. Porello, *R. Confalonieri. Evaluating the Interpretability of Threshold Operators.* In Proceedings of the 23rd International Conference on Knowledge Engineering and Knowledge Management (EKAW 2022), pp. 136–151, 2022. `https://ekaw2022.inf.unibz.it/awards/`

Sept. 2022: *Best Research Paper Award*
Awarded by: EPIA 2022 PC Chairs (Sponsored by Springer)
For the paper: *R. Confalonieri*, P. Galliani, O. Kutz, D. Porello, G. Righetti, N. Troquard. *Almost Certain Termination for $\mathcal{ALC}$ Weakening.* In Proceedings of the 21st EPIA Conference on Artificial Intelligence (EPIA 2022), pp. 663–675, 2022. `https://epia2022.inesc-id.pt/?page_id=508`

7 Organisation and Chair of Scientific Events

Jul. 2017: *8th Workshop Computer Science Research Meets Business: Data Science*, held in Bolzano at Brennercom S.p.a., on July 6, 2017. Co-organised with Prof. Johann Gamper, Federica Cumer, Andrea Janes, and 'Unternehmenerverband Südtirol'.

Oct. 2017: *SmartDF in the NOI TechPark Opening Day*, co-organised with Andrea Janes, 21 October, 2017.

Sep. 2017: *Co-chair of the International Workshop on Data meets Applied Ontologies (DAO)*, Part of Proceedings of the Joint Ontology Workshops 2017 Episode 3: The Tyrolean Autumn of Ontology, Bozen-Bolzano, Italy, September 21-23, 2017. Co-organised with D. Calvanese and A. Janes.

Sep. 2018: *South TyroLean Startup Night*, September 13, 2018, NOI TechPart, Bolzano, Italy. Co-organised with Alessandra Melonio, Xiaofeng Wang, and Andrea Janes.

Nov. 2018: *Co-chair of the 1st International Workshop on Methods for Interpretation of Industrial Event Logs (MIEL 2018)* co-located with the 19th International Conference on Intelligent Data Engineering and Automated Learning, November 21-23, Madrid, Spain. Co-organised with G. J. Nalepa, D. Camacho, E. Brzychczy, and M. Atzmueller.

Dec. 2018: *Co-chair of the 7th International Workshop on Computational Creativity, Concept Invention, and General Intelligence, Bozen-Bolzano (C3GI)*, Italy, December 13-15, 2018. Co-organised with O Kutz, M. M. Hedblom, T. R. Besold, C. León, T. Veale, J. Bateman.

Sep. 2019: *Co-chair of the 2nd International Workshop on Methods for Interpretation of Industrial Event Logs (MIEL 2019)* co-located with the 17th International Business Process Management Conference (BPM 2019) Vienna, September 1-6, 2019. Co-organised with G. J. Nalepa, D. Camacho, E. Brzychczy, M. Atzmueller, and M. Montali.

Sep. 2019: *Co-chair of the Invited Symposium 'What makes a good explanation? Cognitive dimensions of explaining intelligent machines'*, Part of the 41th Annual Meeting of the Cognitive Science Society, CogSci 2019: Creativity + Cognition + Computation, Montreal, Canada, July 24-27, 2019. Co-organised with T. R. Besold and T. Weyde.

Sep. 2019: *Co-chair of the International Workshop on Data meets Applied Ontologies in Open Science and Innovation Workshop (DAO-SI)*, Part of Joint Ontology Workshops 2019, Episode 5: The Styrian Autumn of Ontology, Graz, Austria, September 23-25, 2019. Co-organised with A. Mosca and D. Calvanese.

Jan. 2021: *Chair of the AAAI 21 Tutorial* 'RecoXplainer*: An Extensible Toolkit for Explainable Recommender Systems*, Thirty-Fifth AAAI Conference on Artificial Intelligence, Online, February 2–9, 2021. Co-organised with L. Coba, M. Zanker.

Sep. 2021: *Chair of the International Workshop on Data meets Applied Ontologies in Explainable Artificial Intelligence (DAO-XAI)*, The Workshop is held as Part of the Bratislava Knowledge September, BAKS 2021, 18–19 September 2021. Co-organised with D. Calvanese, O. Kutz.

Sep. 2021: *Chair of the 1st Workshop on Hyperspectral Images for Inspection Applications: The Use-case of Wood and Fungi Detection*, Part of the H2I project, Bolzano (Online), 16 September 2021. Co-organised with T. Tillo, and M. Caffini.

Jun. 2022: *Local chair of the 13th International Conference on Computational Creativity (ICCC 2022)*, June 2022, Bolzano. Italy. Co-organised with O. Kutz.

Jun. 2022: *Doctoral consortium chair of the 13th International Conference on Computational Creativity (ICCC 2022)*, June 2022, Bolzano, Italy. Co-organised with O. Kutz.

Nov. 2022: *Program chair of the 6th Workshop on Advances in Argumentation in Artificial Intelligence (AI^3 2022)*, co-located with the 21st International Conference of the Italian Association for Artificial Intelligence (AIxIA 2022), Udine. Co-organised with D. Porello.

Sept. 2024: *Co-chair of the special track on 'Neurosymbolic XAI'* at the 1st International Conference on Neurosymbolic Learning and Reasoning (NeSy 2024), to be held in Barcelona, 9 – 12 September 2024. Co-organised with B. Wagner.

Sept. 2024: *Co-chair of the 4th International Workshop on Data meets Applied Ontologies (DAO-XAI 2024)* colocated with the 27th European Conference on Artificial Intelligence, to be held in Barcelona, 9 – 25 October 2024. Co-organised with O. Kutz.

Teaching Experience

8 Teaching Experience

Roberto has taught both at the University and Vocational Training level. In 2013 he got a Master degree in Vocational Training in Spain (equivalent to the Italian TFA). In 2016, he was Adjunct Professor at the Faculty of Mathematics and Computer Science of the University of Barcelona (UB) in Spain. Since 2016, he is a lecturer in the online M.Sc. of Research in Artificial Intelligence organised by the 'Universidad Internacional Menendez Pelayo'.

He can deliver courses on a wide range of topics (Basic Computer Science and Mathematics, AI and Knowledge Representation and Agents, AI and Machine Learning, AI and Applied Ontology, and AI and Cognitive Sciences), and in different languages, namely Italian, German, English, Spanish and Catalan.

8.1 Teaching Statement

I always aim at emphasising inclusive and participatory teaching. My approach to teaching consists of: i) emphasis on student feedback and active participation; ii) Emphasis on project-based teaching (for instance by devising group projects based on students' questions and interests, and then by supervising students' work over the course of the term); iii) emphasis on barrier-free interaction between lecturer and students (for instance, active participation during courses, flip-classroom, and self-responsible study work by the students).

At the Free University of Bozen-Bolzano I developed from the ground-up the new course 'Advanced Topics in Machine Learning' for the Master in Computational Data Science, taught labs on 'Discrete Mathematics' (in German), and on 'Programming Project', and 'Web and Internet Engineering'.

My teaching experience can contribute to a number of Bachelor and Master programmes. My teaching interests include in particular a number of interdisciplinary topics which lend themselves well to student projects and interactive teaching methods. Core interests and competencies in teaching are the following:

- **Basic Computer Science and Mathematics:** Programming, Web development; Discrete Mathematics;
- **AI and Knowledge Representation and Reasoning, Agents:** KR languages, reasoning techniques, non-monotonic reasoning, description logic, multi-agent systems, agents technologies, Electronic Institutions.
- **AI and Machine Learning:** Machine Learning, Deep Learning, training Deep Neural Networks, transfer learning, Convolutional Neural Networks, Sequence Models, GANs.

– **AI and Applied Ontology & Semantic Web:** Ontological principles and modelling, applications, foundations of Semantic Web technologies, Semantic repositories.

– **AI and Cognitive Sciences:** Analogy and blending, computational models; Computational Creativity; Concept Creation, and Refinement.

8.2 Lecturer of BSc and MSc Level Courses

Spring 2006: *Computer Architecture*, 'Programming in Assembly', Università di Bologna, Italy.
Role: Teching Assistant.
Class level: B.Sc. in Computer Science.
Course load: 40 hours, 50 Students (approx.).
Language of teaching: Italian.

Spring 2011: *Applications of Artificial Intelligence*, 'Engineering Multi-Agent Systems', Universitat Politècnica de Catalunya, Barcelona, Spain.
Role: Lecturer.
Class level: B.Sc. in Computer Science Engineering.
Course load: 15 hours, 25 Students (approx.).
Language of teaching: English.

Fall 2016: *Introduction to Programming*, Universitat de Barcelona, Spain.
Role: Teaching Assistant.
Class level: B.Sc. in Computer Science Engineering.
Course load: 30 hours, 25 Students (approx.).
Language of teaching: Catalan and Spanish.

Since 2016: *Answer Set Programming* in the module 'Razonamiento automatico', Universidad Internacional Menendez Pelayo.
Role: Lecturer.
Class level: M.Sc. of Research in Artificial Intelligence.
Course load: online.
Language of teaching: Spanish.

Spring 2020 *Programming Project*, Free University of Bozen-Bolzano, Italy.
Role: Teaching Assistant.
Class level: B.Sc. in Computer Science
Course load: 30 hours, 20 Students (approx).
Language of teaching: English.

Spring 2020 *Web and Internet Engineering*, Free University of Bozen-Bolzano, Italy.
Role: Teaching Assistant.
Class level: B.Sc. in Computer Science, and B.Sc. in Informatics and Management of Digital Business
Course load: 20 hours, 20 Students (approx).
Language of teaching: English.

Fall 2020 *Discrete Mathematics*, Free University of Bozen-Bolzano, Italy.
Role: Teaching Assistant.
Class level: B.Sc. in Computer Science
Course load: 20 hours, 20 Students (approx).
Language of teaching: German.

Fall 2020 *Advanced Topics in Machine Learning*, Free University of Bozen-Bolzano, Italy.
Role: Lecturer.
Class level: M.Sc. in Computational Data Science
Course load: 60 hours, 15 Students (approx).
Language of teaching: English.

Fall 2021 *Discrete Mathematics*, Free University of Bozen-Bolzano, Italy.
Role: Teaching Assistant.
Class level: B.Sc. in Computer Science
Course load: 20 hours, 25 Students (approx).
Language of teaching: German.

Fall 2021 *Advanced Topics in Machine Learning*, Free University of Bozen-Bolzano, Italy.
Role: Lecturer.
Class level: M.Sc. in Computational Data Science
Course load: 60 hours, 10 Students (approx).
Language of teaching: English.

Fall 2022 *Informatica e Bioinformatica*, University of Padova, Italy.
Role: Lecturer.
Class level: B.Sc. in Molecular Biology
Course load: 32 hours, 105 Students (approx).
Language of teaching: Italian.

Fall 2022 *Programmazione*, University of Padova, Italy.
Role: Lecturer.
Class level: B.Sc. in Mathematics
Course load: 64 hours, 115 Students (approx).
Language of teaching: Italian.

Spring 2022 *Artificial Intelligence*, University of Padova, Italy.
Role: Lecturer.
Class level: B.Sc. in Law and Technology
Course load: 32 hours, 50 Students (approx).
Language of teaching: English.

Fall 2023 *Programmazione*, University of Padova, Italy.
Role: Lecturer.
Class level: B.Sc. in Mathematics
Course load: 64 hours, 115 Students (approx).
Language of teaching: Italian.

Spring 2023 *Artificial Intelligence*, University of Padova, Italy.
Role: Lecturer.
Class level: B.Sc. in Law and Technology
Course load: 32 hours, 50 Students (approx).
Language of teaching: English.

Spring 2023 *Knowledge Representation and Learning*, University of Padova, Italy.
Role: Lecturer.
Class level: M.Sc. in Data Science
Course load: 24 hours, 50 Students (approx).
Language of teaching: English.

8.3 Vocational Training

Falls 2014 – 2017 *Software Development*, Linkia FP - Formación profesional a distancia oficial, Barcelona, Spain.
Class level: Vocational Training in Computer Science.
Course load: 66 hours, 50 Students (approx.).
Language of teaching: Spanish.

Spring 2014 *Web application development*, Centre Estudis Stucom, Barcelona, Spain.
Class level: Vocational Training in Computer Science.
Course load: 240 hours, 15 Students (approx.).
Language of teaching: Spanish.

8.4 Thesis Supervision

I strongly support collaborative research, and I particularly enjoy working with students and young researchers. I supervisioned three B.Sc. thesis in Computer Science and Artificial Intelligence, and four M.Sc. thesis in Artificial Intelligence.

8.4.1 Bachelor Thesis Supervision

2015 *PeerFlow Cloud: Migración de P2P a Elastic Cloud Computing*
Universitat Autònoma de Barcelona, July 2015.
Student: Germán Arranz Cobo
Level: B.Eng. in Telecommunications engineering
Topic: Engineering Multi-agents systems

2018 *Design, Implementation, and Evaluation of a Technology Transfer Platform*
Free University of Bozen-Bolzano, October 2018, co-directed with Dr. Andrea Janes.
Student: Mirjam Moroder
Level: Bachelor in Computer Science and Engineering
Topic: Software Engineering, Technology Transfer

2019 *Reconstruction of User Sessions for Data Mining: The Case Study of ONCONET2*
Free University of Bozen-Bolzano, March 2019, co-directed with Prof. Markus Zanker.
Student: Abimanyu Ravi
Level: Bachelor in Computer Science and Engineering
Topic: Machine Learning, Technology Transfer

2023 *Recruitment systems nowadays: how XAI can improve trust*
University of Padova, October 2023.
Student: Cesare Gortana
Level: Bachelor in Law and Technology
Topic: Artificial Intelligence, Explainable AI, Law

2023 *Analisi dei Sistemi di Guida Autonoma Attraverso un Approccio Neuro-Simbolico*
University of Padova, October 2023.
Student: Simone Zanetti
Level: Bachelor in Law and Technology
Topic: Artificial Intelligence, Explainable AI, Law

2023 *Analisi degli approcci per la rilevazione dei discorsi di odio attraverso l'Explainable AI*
University of Padova, October 2023.
Student: Matilde Turato
Level: Bachelor in Law and Technology
Topic: Artificial Intelligence, Explainable AI, Law

2023 *Exploring Artificial Intelligence and Fairness: Uncovering and Addressing Biases in Algorithmic Decision-making*
University of Padova, December 2023.
Student: Miruna Elena Gheorghiu
Level: Bachelor in Law and Technology
Topic: Artificial Intelligence, Explainable AI, Law

8.4.2 Master Thesis Supervision

2010 *Combining Coordination and Organisation Mechanisms for the Development of a Dynamic Context-aware Information System Personalised by means of Logic-based Preference Methods*
Universitat Politècnica de Catalunya, September 2010.
Student: Manel Palau
Level: Master thesis
Topic: Recommender Systems, Qualitative User Preferences, Computational Logic
Qualification: Excellent (9/10)

2021 *Federated Reinforcement Learning on the Edge*
Free University of Bozen-Bolzano. September 2021, co-directed with Prof. Antonio Liotta.
Student: Hannes Wiedenhofer
Level: Master thesis
Topic: Federated Machine Learning, Reinforcement Learning
Qualification: 110/110

2021 *A CNN-based Approach for Hyperspectral Images Classification: A Case Study in Wood Fungi Detection*
Free University of Bozen-Bolzano. September 2021, co-directed with Prof. Tammam Tillo.
Student: Davide Cremonini
Level: Master thesis
Topic: Computer Vision, Hyperspectral image classification, Deep Learning
Qualification: 110/110 *cum laude*

2021 *Privacy-Preserving Machine Learning via Multi-Party Computation*
Free University of Bozen-Bolzano. September 2021.
Student: Andrei Buliga
Level: Master thesis
Topic: Machine Learning, Privacy
Qualification: 110/110 *cum laude*

2022 *A Framework for Semantics-aware Review Analysis*
Free University of Bozen-Bolzano. March 2022.
Student: André Wendland
Level: Master thesis
Topic: Semantic Data Mining
Qualification: 110/110 *cum laude*

2022 *A methodology for guiding human evaluation in Explainable Artificial Intelligence*
Free University of Bozen-Bolzano. July 2022.
Student: Marco Zenere
Level: Master thesis
Topic: Explainable AI
Qualification: 106/110

2022 *Towards Verification of Black Box Models using Binarised Neural Network*
Universidad Internacional Menendez Pelayo. September 2022.
Student: Victoria Margarita Cal Gonzáles
Level: Master thesis
Topic: Explainable AI
Qualification: 8,25/10

2022 *Verifying Properties of Black Box Models using Binarised Neural Network*
Universidad Internacional Menendez Pelayo. September 2022.
Student: Pedro Figueiras
Level: Master thesis
Topic: Explainable AI

8.4.3 PhD Thesis Supervision

2024-ongoing *Towards Explainable and Secure Artificial Intelligence with Prevention of Misuse in LLMs*
PhD Programme in Brain, Mind and Computer Science. University of Padua, Italy.
Student: Matteo Gioele Collu
Role: Main advisor (co-advisor Prof. Mauro Conti)
Topic: LLMs, Cybersecurity, Explainable AI

2024-ongoing *Developing and Validating Methods for Human-AI Alignment: Towards" Right for the Right Reason" (RRR) Systems.*

PhD Programme in Information and Communication Technologies, University of Granada, Spain.
Student: David Méndez Blanque,
Role: Co-advisor (main advisor Prof. Natalia Díaz Rodríguez)
Topic: Neurosymbolic AI, Explainable AI

8.4.4 PhD Thesis Evaluation

2023: Member of the committee for the defence of the Ph.D. thesis in the XXXV°cycle *"End-to-end Neuro-symbolic Approaches for Event Recognition"* by Gianluca Apriceno, at the *University of Trento*, Italy; supervisor Dr. Luciano Serafini, co-supervisor Prof. Andrea Passerini.

2024: Member of the committee for the defence of the Ph.D. thesis *"Process-to-Text: A Framework for the Automatic Generation of Natural Language Descriptions of Processes"* by Yago Fontenla Seco, at the *Universidad de Santiago de Compostela*, Spain; Doctoral Programme in Information Technology Research; supervisors Prof. Dr. Alberto J. Bugarín Diz and Prof. Dr. Manuel Lama Penín.

2024: Member of the committee for the defence of the Ph.D. thesis *"Human-centred Counterfactual Explanations for Explainable AI"* by Muhammad Suffian, at the *Università degli Studi di Urbino Carlo Bo*, Italy; Doctoral Programme in Research Methods in Science and Technology Cycle XXXVI; supervisors Prof. Alessandro Bogliolo and Prof. José María Alonso Moral.

Academic Responsibilities and Memberships

9 Academic Responsibilities and Memberships

Roberto acted as technology transfer manager and RTD's representative for the Faulty of Computer Science of UniBZ. He has participated in a number of programme committees of top-tier AI conferences both as a Senior PC and PC member (IJCAI, AAAI, ECAI), and he serves as reviewer for international journals and conferences.

9.1 Internal Appointments to Faculty and University Boards

I have been appointed to various boards:

- Jan. 2017 – Sept. 2018: *Technology transfer manager* of the Smart Data Factory, the technology transfer lab of the Faculty of Computer Science. Free University of Bozen-Bolzano, Italy.
- Jan. 2017 – Sept. 2018: *Representative* of the Researchers with a fixed-term contract in the Faculty Council of Computer Science. Free University of Bozen-Bolzano, Italy.
- Mar. 2020 – Mar. 2021: *Tutor* of the Master of Computational Data Science, Faculty of Computer Science, Free University of Bozen-Bolzano, Italy.
- Nov. 2021 – Aug. 2022: *Member* of the PhD Committee (XXXVII PhD Cycle), Faculty of Computer Science, Free University of Bozen-Bolzano, Italy. The selection was based on the fulfilment of the ministerial requirements to have at least three scientific publications indexed and four journal articles in the period 2017-2021.
- Mar. 2022 – Aug. 2022: *Tutor* of the Master of Computational Data Science, Faculty of Computer Science, Free University of Bozen-Bolzano, Italy.
- Oct. 2022 – now: *Member* of the evaluation committee for the selection of international students to be admitted to the Master of Computer Science, Department of Mathematics, University of Padua, Italy.
- Oct. 2023 – now: *Member* of the evaluation committee for the selection of foreigners students to be admitted to the Ph.D. program in Brain, Mind and Computer Science, University of Padova, Italy.
- Oct. 2023 – now: *Member* of the Faculty Board of the Ph.D program in Brain, Mind and Computer Science, University of Padova, Italy.

9.2 Project Evaluation and other Referee Activities

2021: Member of the evaluation committee for project proposals submitted to the *Academy of Finland's Research Council for Natural Sciences and Engineering* Frontier AI Technologies review panel. Evaluation of 11 project proposals (6 single-applicant and 5 consortium proposals) on AI and applications thereof in the fields on eXplainable AI, Interpretable ML, health, intelligent software systems, and computer vision.

2023: Evaluator for project proposals submitted to the *Quebec-Flanders Research Program:* Frontier AI Technologies review panel.

9.3 Editorial Activity

Feb. 2020 – Mar. 2022: Associate Editor of the *Cognitive Research Science Journal* published by Elsevier.

Mar. 2020 – now: Associate Editor of the *AI - Open Access Journal* published by MDPI.

May 2021– August 2023: Guest editor of the special issue of the *Semantic Web Journal* on 'The Role of Ontologies and Knowledge in Explainable Artificial Intelligence'.

Apr. 2022 – now: Senior Editor of the *Cognitive Research Science Journal* published by Elsevier.

Nov. 2022 – now: Associate Editor of the *Neurosymbolic Artificial Intelligence Journal* to be published by IOS Press.

Feb 2023– now: Guest editor of the special issue series 'The Cognitive Side of Explainable Artificial Intelligence' to be published in the *Cognitive Systems Research journal* (Elsevier).

Sept 2024– now: Guest editor of the special issue 'NeSy 2024 Extended papers' to be published in the *Neurosymbolic AI journal* (IOS Press).

9.4 Program Committee Membership

Before 2019

- *CONIELECOMP 2012.* 22nd International Conference on Electronics, Communications and Computers, Cholula Puebla, México, February 27–29, 2012.
- *CONIELECOMP 2014.* 24th International Conference on Electronics, Communications and Computers, Cholula Puebla, México, February 26–28, 2014.
- *CONIELECOMP 2015.* 25th International Conference on Electronics, Communications and Computers, Cholula Puebla, México, February 25–27, 2015.
- *CONIELECOMP 2016.* 26th International Conference on Electronics, Communications and Computers, Cholula Puebla, México, February 24–26, 2016.
- *IDEAL 2018.* The 19th International Conference on Intelligent Data Engineering and Automated Learning, Madrid, Spain, November 21–23, 2018.

2019

- *IDEAL 2019.* The 20th International Conference on Intelligent Data Engineering and Automated Learning, Manchester, UK, 2019.
- *IJCAI 2019.* The 28th International Joint Conference on Artificial Intelligence, Macao, China, August 10–16, 2019.
- *AAAI 2019.* 33rd AAAI Conference on Artificial Intelligence, Honolulu, Hawaii, USA, January 27–February 1, 2019.

2020

- *IDEAL 2020.* The 21st International Conference on Intelligent Data Engineering and Automated Learning, Manchester, UK, 2020.
- *ECAI 2020.* 24th European Conference on Artificial Intelligence, Santiago de Compostela, Spain, 8–12 June, 2020.
- *AAAI 2020.* The Thirty-Fourth AAAI Conference on Artificial Intelligence, Hilton, New York Midtown, New York, New York, USA, February 7–12, 2020.
- *IJCAI-PRICAI 2020 (Senior PC Member).* The 29th International Joint Conference on Artificial Intelligence and the 17th Pacific Rim International Conference on Artificial Intelligence, Yokohama, Japan, July 11–17, 2020.

2021

- *IDEAL 2021.* The 22nd International Conference on Intelligent Data Engineering and Automated Learning, Manchester, UK, November 25–27, 2021.
- *DL 2021.* The 34th International Workshop on Description Logics, DL 2021, Bratislava, Slovakia, September 19–22, 2021.
- *AIxIA2021.* The Italian Workshop on Explainable Artificial Intelligence, XAI 2021, co-located with AIxIA 2021, Milano, Italy, November 29–30, 2021.
- *AAAI 2021 (Senior PC Member).* The Thirty-Fifth AAAI Conference on Artificial Intelligence, Online, February 2–9, 2021.
- *IJCAI 2021 (Senior PC Member).* The 30th International Joint Conference on Artificial Intelligence, Montreal, Canada, August 19–26, 2021.

2022

- *CD-MAKE 2022.* International IFIP Cross Domain (CD) Conference for Machine Learning & Knowledge Extraction (MAKE), August 23 – 26, 2022, Vienna, Austria.
- *DL 2022.* The 35th International Workshop on Description Logics, August 7 – 10, 2022 · Haifa, Israel, 2022.
- *AIB 2022.* Research School in Artificial Intelligence in Bergen - AIB 22, Knowledge Graphs and Machine Learning, 7 – 11 June 2022, Bergen, Norway.
- *IJCAI 2022 (Senior PC Member).* The 31st International Joint Conference on Artificial Intelligence, July 23-29, Vienna, 2022.
- *AIxIA2021.* The Italian Workshop on Explainable Artificial Intelligence, XAI 2022, co-located with AIxIA 2022, Udine, Italy, November 28 – December 2, 2022.
- *IDEAL 2022.* The 23rd International Conference on Intelligent Data Engineering and Automated Learning, Manchester, UK, November 24–26, 2022.
- *AAAI 2022 (Senior PC Member).* The 36th AAAI Conference on Artificial Intelligence, February 22 – March 1, 2022, Vancouver, BC, Canada 2022.

2023

- *ICCC 2023 (PC Member).* The 14th International Conference on Computational Creativity, June 19 – 23, 2023.
- *IJCAI 2023 (PC Member).* The 32nd International Joint Conference on Artificial Intelligence, Cape Town, South Africa, August 9–25, 2023.
- *ECAI 2023 (Senior PC Member).* The 26th European Conference on Artificial Intelligence, Kraków, Poland, September 30 – October 5, 2023.

2024

- *FOIS 2024 (PC Member).* The 14th International Conference on Formal Ontologies in Information Systems (FOIS 2024), Enschede, Netherlands, July 15–19, 2024.
- *ICCC 2024 (PC Member).* The 15th International Conference on Computational Creativity, Jönköping, Sweden, June 17 – 21, 2024.
- *IJCAI 2024 (PC Member).* The 33rd International Joint Conference on Artificial Intelligence, Jeju, South Korea, August 3–9, 2024.

9.5 Reviewing Activity (in addition to PC memberships)

Reviewer activity for journals:

Autonomous Agents and Multi-Agent Systems Journal; Applied Ontology Journal; International Journal of Approximate Reasoning (IJAR); Expert Systems With Applications (ESWA); Semantic Web Journal (SWJ); Artificial Intelligence Journal (AIJ); Machine Learning Journal; IEEE Access; IEEE Computational Intelligence Magazine; IEEE Signal Processing Magazine; IEEE Transactions on Artificial Intelligence; IEEE Transactions on Neural Networks and Learning Systems.

Reviewer activity for conferences:

15. Internationaler Kongress Für Wirtschaftsinformatik (WI 2020); CD-MAKE: International Cross-Domain Conference for Machine Learning and Knowledge Extraction (CD-MAKE 2019); International Conference on Computational Creativity (ICCC 2016, 2017); International Semantic Web Conference (ISWC 2016); 14th International Conference on Principles of Knowledge Representation and Reasoning (KR 2014).

9.6 Scientific Association Membership

Since 2012 *ACIA*: Catalan Association for Artificial Intelligence.

Since 2012 *AI*IA*: Italian Association for Artificial Intelligence.

Since 2016 Association for Computational Creativity.

Since 2020 ACM - Association for Computing Machinery.

Since 2021 IEEE - Institute of Electrical and Electronics Engineers.

Publications

10 Publications

The publications are listed at the end of this document.

Public Press About the Applicant

11 Public Press About the Applicant

2014 DiCat: “Galardonado el proyecto de spin-off Social Browsing, del IIIA-CSIC”, Article online.

2017 *Academia*: “Attenti a quei nerd”, Article online.

2018 *Salto.bz*: “Attenti a quei nerd”, Article online.

2020 *UniNews*: “Cosa si nasconde dietro gli algoritmi? Lo scopre Trepan Reloaded”, Article online.

2020 *Rai Südtirol*, Campus - “Faculty of Computer Science - Free University of Bozen-Bolzano sucht neue Ansätze, um immer größer werdende Datenmengen zu verarbeiten”, Magazin für Forschung und Entwicklung.

2022 *Salto.bz*: “Können Computer kreativ sein”, together with Oliver Kutz, Article online.

2022 *AltoAdige TV Südtirol*, “L’intelligenza artificiale può creare arte?”, Alto Adige TV.

12 Dissemination, Invited Talks and Seminars

12.1 Invited Talks and Seminars

Sep. 2014: *Semantic Web Services in IRS-III*, Faculty of Computer Science, Free University of Bozen-Bolzano, Italy, September 2014.

Feb. 2018: *Smart Data Factory Lab*, Winter Seminar of the Faculty of Computer Science, Kolpinghaus Bozen, 39100 Bolzano, Italy, 21 February 2018.

Jul. 2018: *Open-data Standards for Events and Ski Information*, Meeting of the AlpineBits Alliance, NOI Techpark, 39100, Bolzano, Italy, 13 July 2018.

Nov. 2018: *The Role of Ontologies in Computational Creativity*, AI Soiree, Alpha AI Lab, Telefónica Innovación Alpha, Barcelona, Spain, November 2018.

Jul. 2019: *Explainable AI: Why, How, What*, Lunch Seminar at Alpha AI Lab, Telefónica Innovación Alpha, Barcelona, Spain, 17 July 2019.

Mar. 2021: *Using Ontologies to Enhance Human-Understandability of Post-hoc Explanations of Black-box Models*, KRDB Seminar, Faculty of Computer Science, Free University of Bozen-Bolzano, Italy, 11 March 2021.

Aug. 2021: *The Role of Ontologies in Human-Understandability of Post-hoc Explanations of Black-box Models*, Invited Seminar, Department of Informatics, University of Bergen, Norway, 24 August 2021.

Sept. 2021: *Empowering cyber security with semantics for better intelligence sharing and data analysis*, Panelist, Workshop on Application of Knowledge Methods in Information Security, Bratislava, Slovakia, 18 September 2021.

December. 2021: *The Role of Ontologies in Explainable AI*, Seminar, Department of Information Engineering and Computer Science, University of Trento, Italy, 15 December 2021.

April. 2022: *The Role of Ontologies in Explainable AI and Computational Creativity*, Seminar, Department of Mathematics, University of Padova, Italy, 01 April 2022.

Oct. 2023: *On the multiple Roles of Ontologies in Explainable AI*, OntoCommon Workshop 2023, University of Bologna, Italy, 02 October 2023.

12.2 Presentations at Conferences and Workshops

May. 2008: *International Workshop of Service-Oriented Computing: Agents, Semantics, and Engineering* (SOCASE 2008), co-located with AAMAS 2008, Estoril, Portugal.

Sep. 2009: *2nd International Workshop on Software Engineering for Answer Set Programming* (SEA'09), co-located with LPNMR 2009, Potsdam, Germany.

Sep. 2009: *10th International Conference on Logic Programming and Nonmonotonic Reasoning* (LPNMR 2009), Potsdam, Germany.

Dec. 2009: *XIth International Conference of the Italian Association for Artificial Intelligence* (AI*IA 2009), Reggio Emilia, Italy.

Feb. 2010: *Sixth International Symposium on Foundations of Information and Knowledge Systems* (FoIKS 2010), Sofia, Bulgaria.

Jun. 2011: *11th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty* (ECSQARU 2011), Belfast, Northern Ireland, UK.

Jul. 2015: *Twenty-Fourth International Joint Conference on Artificial Intelligence*, IJCAI 2015, Buenos Aires, Argentina.

Jul. 2015: *International Workshop on Ontologies and logic programming for query answering*, Joint Ontology Workshops 2015. Episode 1: The Argentine Winter of Ontology, co-located with IJCAI 2015, Buenos Aires, Argentina.

Jul. 2016: *7th International Conference on Computational Creativity (ICCC 2016)*, Paris, France.

Aug. 2016: *Workshop on Computational Creativity, Concept Invention, and General Intelligence (C3GI 2016)*, co-located with the 28th European Summer School in Logic, Language and Information (ESSLLI 2016), Bozen-Bolzano, Italy.

Jul. 2018: *27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence (IJCAI-ECAI 2018)*, Stockholm, Sweden.

Jul. 2019: *41th Annual Meeting of the Cognitive Science Society*, CogSci 2019: Creativity + Cognition + Computation, Montreal, Canada.

Sept. 2020: *1st International Workshop on Explainable Logic-Based Knowledge Representation*, XLoKR 2020, Online.

Sept. 2020: *24th European Conference on Artificial Intelligence*, ECAI 2020, Online, Santiago de Compostela, Spain.

Nov. 2021: *The South Tyrol Free Software Conference*, SFSCon 2020, Bolzano-Bozen, Italy.

Jan. 2021: *35th AAAI Conference on Artificial Intelligence*, AAAI-21, Online, February

Aug. 2021: *30th International Joint Conference on Artificial Intelligence*, IJCAI-21, Online, Montreal, Canada.

Sept. 2021: *3rd International Workshop on Data meets Applied Ontologies in XAI*, DAO-XAI-2021, Bratislava, Slovakia.

Nov. 2021: *3rd International Workshop on Data meets Applied Ontologies in XAI*, DAO-XAI-2021, Bratislava, Slovakia.

Nov. 2021: *The South Tyrol Free Software Conference*, SFSCon 2021, Bolzano-Bozen, Italy.

Jul. 2022: *IEEE World Congress on Computational Intelligence*, WCCI 2022, Padova, Italy.

Aug. 2022: *35th International Workshop on Description Logics*, DL 2022, Haifa, Israel.

Aug. 2022: *International Workshop on Applied Research, Technology Transfer and Knowledge Exchange in Software and Data Science*, ARTE 2022, Wien, Austria.

Sep. 2022: *21st EPIA Conference on Artificial Intelligence*, EPIA 2022, Lisbon, Portugal.

Sep. 2022: *23rd International Conference on Knowledge Engineering and Knowledge Management*, EKAW 2022, Bolzano-Bozen, Italy.

Nov. 2022: *The South Tyrol Free Software Conference*, SFSCon 2022, Bolzano-Bozen, Italy.

Oct. 2023: *OntoCommons Workshop - Formal Ontologies, Applied Sciences and Data*, OntoCommons Workshop 2023, University of Bologna, Italy, 02 October 2023.

Spin-offs and Enterpreneurship

13 Spin-offs and Enterpreneurship

2014 Roberto acted as CEO and CTO of *SocialBrowsing*, a spin-off company of the Artificial Intelligence Research Institute of the Spanish Council for Scientific Research (IIIA-CSIC), Bellaterra, Spain.

Roberto was awarded with a price in cash of €2.000 for the *2nd Place for Best Business Plan for 'SocialBrowsing'* in the 3rd edition of the VALORTEC contest (see also in Awards).

2017-2018 Roberto acted as Technology Transfer Manager and Researcher at the Smart Data Factory, a technology transfer center of the Faculty of Computer Science of the Free University of Bozen-Bolzano, Italy.

14 Languages

—– **Italian:** native language;

2013 **Catalan:** level C1 (CNL, 2014);

2014 **English:** level C1 (Cambridge, 2014);

2015 **Spanish:** level C1 (Cervantes, 2014);

2016 **German:** level C1 (Patentino A - Provincia di Bolzano, 2017).

Publications

Edited Books and Proceedings

[B-1] R. Confalonieri, D. Calvanese, and A. Janes. Proceedings of data meets applied ontologies (dao). In S. Borgo, O. Kutz, F. Loebe, and F. Neuhaus, editors, *Part of 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, 2017.

[B-2] G. J. Nalepa, D. Camacho, E. Brzychczy, R. Confalonieri, and M. Atzmueller, editors. *Proceedings of the 1st International Workshop on Methods for Interpretation of Industrial Event Logs (MIEL 2018), co-located with the 19th International Conference on Intelligent Data Engineering and Automated Learning, November 21-23, Madrid, Spain*, 2018. `https://www.geist.re/miel:miel2018`.

[B-3] O. Kutz, M. M. Hedblom, T. R. Besold, R. Confalonieri, C. León, T. Veale, and J. Bateman, editors. *Joint Proceedings of the Workshops C3GI: The 7th International Workshop on Computational Creativity, Concept Invention, and General Intelligence ISD4: The 4th Image Schema Day, and SCORE: From Image Schemas to Cognitive Robotics*, volume 2347 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2018.

[B-4] R. Confalonieri, A. Pease, M. Schorlemmer, T. R. Besold, O. Kutz, E. Maclean, and M. Kaliakatsos-Papakostas, editors. *Concept Invention: Foundations, Implementation, Social Aspects and Applications*. Springer, series in Computational Synthesis and Creative Systems, 2018. ISBN: `978-3-319-65602-1`.

[B-5] G. J. Nalepa, D. Camacho, E. Brzychczy, R. Confalonieri, M. Atzmueller, and M. Montali, editors. *Proceedings of the 2nd International Workshop on Methods for Interpretation of Industrial Event Logs (MIEL 2019) co-located with the 17th International Business Process Management Conference (BPM 2019) Vienna, September 1-6, 2019*, 2019. `https://www.geist.re/miel:start`.

[B-6] A. Mosca, R. Confalonieri, and D. Calvanese. Proceedings of data meets applied ontologies in open science and innovation workshop (dao-si). In A. Barton, S. Seppälä, and D. Porello, editors, *Part of Joint Ontology Workshops 2019, Episode 5: The Styrian Autumn of Ontology, Graz, Austria, September 23-25, 2019.*, volume 2518 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2019.

[B-7] R. Confalonieri, O. Kutz, and D. Calvanese, editors. *Proceedings of the International Workshop on Data meets Applied Ontologies in Explainable AI (DAO-XAI 2021), Bratislava, September 18-19, 2021*, CEUR Workshop Proceedings. CEUR-WS.org, 2021.

[B-8] M. Hedblom, A. Kantosalo, R. Confalonieri, O. Kutz, and T. Veale, editors. *Proceedings of the 13th International Conference on Computational Creativity (ICCC 2022), Bozen-Bolzano, June 27-July 01, 2022*. Association of Computational Creativity, 2022.

[B-9] R. Confalonieri and D. Porello, editors. *Proceedings of the 6th Workshop on Advances in Argumentation in Artificial Intelligence (AI^3 2022), Udine, Italy, November 28, 2022*, CEUR Workshop Proceedings. CEUR-WS.org, 2022.

[B-10] T. R. Besold, A. d'Avila Garcez, E. Jimenez-Ruiz, R. Confalonieri, P. Madhyastha, and B. Wagner, editors. *18th International Conference, NeSy 2024, Barcelona, Spain, September 9–12, 2024, Proceedings, Part I and II*, Lecture Notes in Computer Science. Springer Cham, 2024. ISBN: `978-3-031-71166-4`.

Papers in Refereed International Journals

[JI-1] R. Confalonieri and J. C. Nieves. Nested Preferences in Answer Set Programming. *Fundamenta Informaticae*, 113(1):19–39, 2011. DOI: `10.3233/FI-2011-597`.

[JI-2] J. C. Nieves and R. Confalonieri. A Possibilistic Argumentation Decision Making Framework with Default Reasoning. *Fundamenta Informaticae*, 113(1):41–61, 2011. DOI: `10.3233/FI-2011-598`.

[JI-3] R. Confalonieri, J. C. Nieves, M. Osorio, and J. Vázquez-Salceda. Dealing with Explicit Preferences and Uncertainty in Answer Set Programming. *Annals of Mathematics and Artificial Intelligence*, 65(2-3):159–198, 2012. DOI: `10.1007/s10472-012-9311-0`.

[JI-4] R. Confalonieri and H. Prade. Using Possibilistic Logic for Modeling Qualitative Decision: Answer Set Programming Algorithms. *International Journal on Approximate Reasoning*, 55(2):711–738, 2014. DOI: 10.1016/j.ijar.2013.11.002. **(Q1, JIF: 2.45)**.

[JI-5] R. Confalonieri, M. Yee-King, K. Hazelden, D. de Jonge, C. Sierra, M. d'Inverno, L. Amgoud, and N. Osman. Engineering Multiuser Museum Interactives for Shared Cultural Experiences. *Engineering Applications of Artificial Intelligence*, 46(Part A):180–195, 2015. DOI: 10.1016/j.engappai.2015.08.013. **(Q1, JIF: 2.37)**.

[JI-6] R. Confalonieri, M. Eppe, M. Schorlemmer, O. Kutz, R. Peñaloza, and E. Plaza. Upward Refinement Operators for Conceptual Blending in the Description Logic $\mathcal{EL}^{++}$. *Annals of Mathematics and Artificial Intelligence*, 82(1-3):69–99, 2018. DOI: 10.1007/s10472-016-9524-8.

[JI-7] M. Eppe, E. Maclean, R. Confalonieri, O. Kutz, M. Schorlemmer, E. Plaza, and K.-U. Kühnberger. A Computational Framework for Conceptual Blending. *Artificial Intelligence*, 258:105–129, 2018. DOI: 10.1016/j.artint.2017.11.005. **(Q1, JIF: 4.48)**.

[JI-8] R. Confalonieri and O. Kutz. Blending under deconstruction: The roles of logic, ontology, and cognition in computational concept invention. *Annals of Mathematics and Artificial Intelligence*, 88(5):479–516, 2020. DOI: 10.1007/s10472-019-09654-6.

[JI-9] R. Confalonieri, L. Coba, B. Wagner, and T. R. Besold. A historical perspective of explainable Artificial Intelligence. *WIREs Data Mining and Knowledge Discovery*, 11(1), 2021. DOI: https://doi.org/10.1002/widm.1391. **(Q1, JIF: 7.59)**.

[JI-10] R. Confalonieri, T. Weyde, T. R. Besold, and F. M. del Prado Martín. Using ontologies to enhance human understandability of global post-hoc explanations of black-box models. *Artificial Intelligence*, 296, 2021. DOI: https://doi.org/10.1016/j.artint.2021.103471. **(Q1, JIF: 14.05)**.

[JI-11] L. Coba, R. Confalonieri, and M. Zanker. recoxplainer: A Library for Development and Offline Evaluation of Explainable Recommender Systems. *IEEE Computational Intelligence Magazine*, 17(1):46–58, 2022. DOI: 10.1109/MCI.2021.3129958. **(Q1, JIF: 11.35)**.

[JI-12] S. Ali, T. Abuhmed, S. El-Sappagh, K. Muhammad, J. M. Alonso-Moral, R. Confalonieri, R. Guidotti, J. Del Ser, N. Díaz-Rodríguez, and F. Herrera. Explainable Artificial Intelligence (XAI): What we know and what is left to attain Trustworthy Artificial Intelligence. *Information Fusion*, 99:101805, 2023. DOI: https://doi.org/10.1016/j.inffus.2023.101805. **(Q1, JIF: 17.56)**.

[JI-13] R. Confalonieri and J. M. Alonso-Moral. An operational framework for guiding human evaluation in Explainable and Trustworthy AI. *IEEE Intelligent Systems*, (01):1–13, 2024. DOI: 10.1109/MIS.2023.3334639. **(Q1, JIF: 6.74)**.

[JI-14] L. Longo, M. Brcic, F. Cabitza, J. Choi, R. Confalonieri, J. D. Ser, R. Guidotti, Y. Hayashi, F. Herrera, A. Holzinger, R. Jiang, H. Khosravi, F. Lecue, G. Malgieri, A. Páez, W. Samek, J. Schneider, T. Speith, and S. Stumpf. Explainable artificial intelligence (xai) 2.0: A manifesto of open challenges and interdisciplinary research directions. *Information Fusion*, 106:102301, 2024. DOI: https://doi.org/10.1016/j.inffus.2024.102301. **(Q1, JIF: 17.56)**.

[JI-15] R. Confalonieri, O. Kutz, D. Calvanese, J. M. Alonso-Moral, and S.-M. Zhou. The role of ontologies and knowledge in Explainable AI. *Semantic Web*, Preprint:1–4, 2024. DOI: 10.3233/SW-243529. **(Q2, JIF: 3.00)**.

[JI-16] R. Confalonieri, P. P. Htun, B. Sun, and T. Tillo. An end-to-end framework for the classification of hyperspectral images in the wood domain. *IEEE Access*, 12:38908–38916, 2024. DOI: 10.1109/ACCESS.2024.3376258.

[JI-17] R. Confalonieri and G. Guizzardi. On the multiple roles of ontologies in explanations for neuro-symbolic ai. *Neurosymbolic Artificial Intelligence*, Preprint:1–15, 2024. DOI: 10.3233/NAI-240754. Preprint.

Book Chapters

[BC-1] R. Confalonieri, M. Schorlemmer, and E. Plaza. Computational Aspects of Concept Invention. In R. Confalonieri, A. Pease, M. Schorlemmer, T. R. Besold, O. Kutz, E. Maclean, and M. Kaliakatsos-Papakostas, editors, *Concept Invention: Foundations, Implementation, Social Aspects and Applications*, pages 31–67. Springer International Publishing, 2018. ISBN: 978-3-319-65601-4. DOI: 10.1007/978-3-319-65602-1_2.

[BC-2] R. Confalonieri, T. Besold, M. Codescu, and M. Eppe. Enabling Technologies for Concept Invention. In R. Confalonieri, A. Pease, M. Schorlemmer, T. R. Besold, O. Kutz, E. Maclean, and M. Kaliakatsos-Papakostas, editors, *Concept Invention: Foundations, Implementation, Social Aspects and Applications*, pages 31–67. Springer International Publishing, 2018. ISBN: 978-3-319-65601-4. DOI: 10.1007/978-3-319-65602-1_7.

[BC-3] M. Yee-King, D. de Jonge, R. Confalonieri, N. Osman, M. d'Inverno, C. Sierra, L. Amgoud, and K. Hazelden. The WeCurate application. In N. Osman, editor, *Electronic Institutions and their Applications*. Springer Cham, 2019. ISBN: 978-3-319-65604-5. To appear.

[BC-4] R. Confalonieri, F. Lucchesi, G. Maffei, and S. C. Solarz. A unified framework for managing sex and gender bias in AI models for Healthcare. In E. G. Davide Cirillo, Silvina Catuara Solarz, editor, *Sex and Gender Bias in Technology and Artificial Intelligence*, chapter 9, pages 179–204. Academic Press, 2022. ISBN: 978-0-12-821392-6. DOI: https://doi.org/10.1016/B978-0-12-821392-6.00004-2.

Papers in Refereed International Conferences

[CI-1] R. Confalonieri, C. Leoni, and L. Picci. Rebag-Ware: Reputation-based Governance of Public Works. In *IST-Africa 2007 Conference Proceedings IIMC International Information Management Corporation*, 2007. ISBN: 1-905824-04-1.

[CI-2] S. Panagiotidi, J. Vázquez-Salcea, S. Álvarez-Napagao, S. Ortega-Martorell, S. Willmott, R. Confalonieri, and P. Storm. Intelligent Contracting Agents Language. In *Proc. of the AISB Symposium on Behaviour Regulation in Multi-Agent Systems (BRMAS 2008), Aberdeen, UK, 2008*, 2008.

[CI-3] R. Confalonieri, S. Álvarez-Napagao, S. Panagiotidi, J. Vázquez-Salcea, and S. Willmott. A Middleware Architecture for Building Contract-Aware Agent-Based Services. In R. Kowalczyk, M. N. Huhns, M. Klusch, Z. Maamar, and Q. B. Vo, editors, *Proceeding of International Workshop of Service-Oriented Computing: Agents, Semantics, and Engineering SOCASE 2008, Estoril, Portugal, May 12, 2008*, number 1013 in Lecture Notes in Computer Science, pages 1–14. Springer-Verlag Berlin Heidelberg, 2008. ISBN: 978-3-540-79967-2. DOI: 10.1007/978-3-540-79968-9_1.

[CI-4] J. S. C. Lam, W. W. Vasconcelos, F. Guerin, D. Corsar, A. Chorley, T. J. Norman, J. Vázquez-Salceda, S. Panagiotidi, R. Confalonieri, I. Gomez, S. Hidalgo, S. Álvarez-Napagao, J. C. Nieves, M. P. Roig, L. Ceccaroni, H. Aldewereld, V. Dignum, F. Dignum, L. Penserini, J. A. Padget, M. D. Vos, D. Andreou, O. Cliffe, A. Staikopoulos, R. Popescu, S. Clarke, P. Sergeant, C. Reed, T. B. Quillinan, and K. Nieuwenhuis. ALIVE: A Framework for Flexible and Adaptive Service Coordination. In H. Aldewereld, V. Dignum, and G. Picard, editors, *Engineering Societies in the Agents World X, 10th International Workshop, ESAW 2009, Utrecht, The Netherlands, November 18-20, 2009. Proceedings*, volume 5006 of *Lecture Notes in Computer Science*, pages 236–239. Springer, 2008. ISBN: 978-3-642-10202-8. DOI: 10.1007/978-3-642-10203-5_21.

[CI-5] J. Vázquez-Salcea, R. Confalonieri, I. Gomez, P. Storm, N. Kuijpers, S. Panagiotidi, and S. Álvarez-Napagao. Modelling Contractually Bounded Interactions in the Car Insurance Domain. In *Proceedings of the First International ICST Conference on Digital Business -DIGIBIZ 2009-, London, June 2009*, 2009. ISBN: 978-963-9799-56-1.

[CI-6] R. Confalonieri, J. C. Nieves, and J. Vázquez-Salceda. Pstable Semantics for Logic Programs with Possibilistic Ordered Disjunction. In R. Serra and R. Cucchiara, editors, *Proceedings of XIth International Conference of the Italian Association for Artificial Intelligence, Reggio Emilia, Italy, December 9-12, 2009*, volume 5883 of *Lecture Notes in Computer Science*, pages 52–61. Springer, 2009. ISBN: 978-3-642-10290-5. DOI: 10.1007/978-3-642-10291-2_6.

[CI-7] R. Confalonieri, J. C. Nieves, M. Osorio, and J. Vázquez-Salceda. Possibilistic Semantics for Logic Programs with Ordered Disjunction. In S. Link and H. Prade, editors, *Proceedings of Foundations of Information and Knowledge Systems, 6th International Symposium, FoIKS 2010, Sofia, Bulgaria, February 15-19, 2010*, volume 5956 of *Lecture Notes in Computer Science*, pages 133–152. Springer, 2010. ISBN: 978-3-642-11828-9. DOI: 10.1007/978-3-642-11829-6_11.

[CI-8] R. Confalonieri, H. Prade, and J. C. Nieves. Handling Exceptions in Logic Programming without Negation as Failure. In W. Liu, editor, *Proceedings of the 11th European Conference of Symbolic and Quantitative Approaches to Reasoning with Uncertainty ECSQARU 2011, Belfast, UK, June 29-July 1, 2011*, volume 6717 of *Lecture Notes in Computer Science*, pages 509–520. Springer, 2011. ISBN: 978-3-642-22151-4. DOI: 10.1007/978-3-642-22152-1_43.

[CI-9] R. Confalonieri and H. Prade. Answer Set Programming for Computing Decisions Under Uncertainty. In W. Liu, editor, *Proceedings of the 11th European Conference of Symbolic and Quantitative Approaches to Reasoning with Uncertainty ECSQARU 2011, Belfast, UK, June 29-July 1, 2011*, volume 6717 of *Lecture Notes in Computer Science*, pages 485–496. Springer, 2011. ISBN: 978-3-642-22151-4. DOI: 10.1007/978-3-642-22152-1_41.

[CI-10] K. Alonso, M. Zorrilla, H. Iñan, M. Palau, R. Confalonieri, J. Vázquez-Salceda, F. J. Calle, and E. Castro. Ontology-based tourism for all recommender and information retrieval system for Interactive Community Displays. In *Proceedings of the 8th International Conference onInformation Science and Digital Content Technology (ICIDT2012)*, volume 3, pages 650–655, 2012. ISBN: 978-1-4673-1288-2.

[CI-11] R. Confalonieri and H. Prade. Encoding Preference Queries to an Uncertain Database in Possibilistic Answer Set Programming. In S. Greco, B. Bouchon-Meunier, G. Coletti, M. Fedrizzi, B. Matarazzo, and R. R. Yager, editors, *Proceedings of the 14th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems Part I, IPMU 2012, Catania, Italy, July 9-13, 2012*, volume 297 of *Communications in Computer and Information Science*, pages 511–520. Springer, 2012. ISBN: 978-3-642-31708-8. DOI: 10.1007/978-3-642-31709-5_52.

[CI-12] R. Confalonieri, H. Iñan, and M. Palau. Handling Uncertain User Preferences in a Context-Aware System. In S. Greco, B. Bouchon-Meunier, G. Coletti, M. Fedrizzi, B. Matarazzo, and R. R. Yager, editors, *Proceedings of the 14th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems Part II, IPMU 2012, Catania, Italy, July 9-13, 2012*, volume 298 of *Communications in Computer and Information Science*, pages 88–97. Springer, 2012. ISBN: 978-3-642-31708-9. DOI: 10.1007/978-3-642-31715-6_11.

[CI-13] L. Amgoud, R. Confalonieri, D. de Jonge, M. d'Inverno, K. Hazelden, N. Osman, H. Prade, C. Sierra, and M. Yee-King. Sharing Online Cultural Experiences: An Argument-Based Approach. In V. Torra, Y. Narukawa, B. López, and M. Villaret, editors, *Proceedings of the 9th International Conference on Modeling Decisions for Artificial Intelligence MDAI 2012, Girona, Catalonia, Spain, November 21-23, 2012*, volume 7647 of *Lecture Notes in Computer Science*, pages 282–293. Springer, 2012. ISBN: 978-3-642-34619-4. DOI: 10.1007/978-3-642-34620-0_26.

[CI-14] M. Yee-King, R. Confalonieri, D. de Jonge, N. Osman, K. Hazelden, L. Amgoud, H. Prade, C. Sierra, and M. d'Inverno. Towards Community Browsing for Shared Experiences: The WeBrowse System. In S. Ossowski, F. Toni, and G. A. Vouros, editors, *Proceedings of the First International Conference on Agreement Technologies, AT 2012, Dubrovnik, Croatia, October 15-16, 2012*, volume 918 of *CEUR Workshop Proceedings*, pages 201–202. CEUR-WS.org, 2012.

[CI-15] L. Amgoud, R. Confalonieri, D. de Jonge, M. d'Inverno, K. Hazelden, N. Osman, H. Prade, C. Sierra, and M. Yee-King. WeCurate: Designing For Synchronised Browsing And Social Negotiation. In S. Ossowski, F. Toni, and G. A. Vouros, editors, *Proceedings of the First International Conference on Agreement Technologies, AT 2012, Dubrovnik, Croatia, October 15-16, 2012*, volume 918 of *CEUR Workshop Proceedings*, pages 168–179. CEUR-WS.org, 2012.

[CI-16] K. Hazelden, M. Yee-King, R. Confalonieri, F. Ghedini, C. Sierra, and M. d'Inverno. WeCurate: Enriching the Sociocultural Practices of the Museum Experience. In K. Ng, J. P. Bowen, and S. McDaid, editors, *Electronic Visualisation and the Arts, EVA 2013, London, UK, 29-31 July 2013*, Workshops in Computing. BCS, 2013. ISBN: 978-1-780172-15-6.

[CI-17] N. Osman, M. d'Inverno, C. Sierra, L. Amgoud, H. Prade, M. Yee-King, R. Confalonieri, D. de Jonge, and K. Hazelden. An experience-based BDI logic: Motivating shared experiences and intentionality. In *IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society, Vienna, Austria, November 10-13, 2013*, pages 6654–6659. IEEE, 2013. ISBN: 978-1-4799-0224-8. DOI: 10.1109/IECON.2013.6700233. **(Best Paper Award in session on 'Cognitive Architectures and Multi-Agent Systems')**.

[CI-18] K. Hazelden, M. Yee-King, R. Confalonieri, C. Sierra, F. Ghedini, D. de Jonge, N. Osman, and M. d'Inverno. WeCurate: multiuser museum interactives for shared cultural experiences. In W. E. Mackay, S. A. Brewster, and S. Bødker, editors, *Proceedings of 2013 ACM SIGCHI Conference on Human Factors in Computing Systems, CHI '13, Paris, France, April 27 - May 2, 2013, Extended Abstracts*, pages 571–576. ACM, 2013. ISBN: 978-1-4503-1952-2. DOI: 10.1145/2468356.2468457. **(CORE: A*)**.

[CI-19] M. Yee-King, R. Confalonieri, D. de Jonge, K. Hazelden, C. Sierra, M. d'Inverno, L. Amgoud, and N. Osman. Multiuser museum interactives for shared cultural experiences: an agent-based approach. In M. L. Gini, O. Shehory, T. Ito, and C. M. Jonker, editors, *Proceedings of the 20th International conference on Autonomous Agents and Multi-Agent Systems, AAMAS '13, Saint Paul, MN, USA, May 6-10, 2013*, pages 917–924. International Foundation for Autonomous Agents and Multiagent Systems IFAAMAS, 2013. ISBN: 978-1-4503-1993-5.

[CI-20] M. Eppe, E. Maclean, R. Confalonieri, O. Kutz, W. M. Schorlemmer, and E. Plaza. ASP, Amalgamation, and the Conceptual Blending Workflow. In F. Calimeri, G. Ianni, and M. Truszczynski, editors, *Proceedings of 13th International Conference on Logic Programming and Nonmonotonic Reasoning LPNMR 2015, Lexington, KY, USA, September 27-30, 2015*, volume 9345 of *Lecture Notes in Computer Science*, pages 309–316. Springer, 2015. ISBN: 978-3-319-23263-8. DOI: 10.1007/978-3-319-23264-5_26.

[CI-21] M. Eppe, R. Confalonieri, E. Maclean, M. A. Kaliakatsos-Papakostas, E. Cambouropoulos, W. M. Schorlemmer, M. Codescu, and K. Kühnberger. Computational Invention of Cadences and Chord Progressions by Conceptual Chord-Blending. In Q. Yang and M. J. Wooldridge, editors, *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015, Buenos Aires, Argentina, July 25-31, 2015*, pages 2445–2451. AAAI Press, 2015. ISBN: 978-1-57735-738-4. **(CORE: A*, Acceptance Rate: 28.6%)**.

[CI-22] R. Confalonieri, J. Corneli, A. Pease, E. Plaza, and M. Schorlemmer. Using Argumentation to Evaluate Concept Blends in Combinatorial Creativity. In H. Toivonen, S. Colton, M. Cook, and D. Ventura, editors, *Proceedings of the Sixth International Conference on Computational Creativity, Park City, Utah, USA, June 29 - July 2, 2015*, pages 174–181. computationalcreativity.net, 2015. ISBN: 978-0-8425-2970-9.

[CI-23] R. Confalonieri, E. Plaza, and M. Schorlemmer. A Process Model for Concept Invention. In F. Pachet, A. Cardoso, V. Corruble, and F. Ghedini, editors, *Proceedings of the Seventh International Conference on Computational Creativity, UPMC, Paris, France, June 27 - July 1, 2016*, pages 338–345. Sony CSL Paris, France, 2016. ISBN: 978-2-7466-9155-1.

[CI-24] M. A. Kaliakatsos-Papakostas, R. Confalonieri, J. Corneli, A. I. Zacharakis, and E. Cambouropoulos. An Argument-based Creative Assistant for Harmonic Blending. In F. Pachet, A. Cardoso, V. Corruble, and F. Ghedini, editors, *Proceedings of the Seventh International Conference on Computational Creativity, UPMC, Paris, France, June 27 - July 1, 2016*, pages 330–337. Sony CSL Paris, France, 2016. ISBN: 978-2-7466-9155-1. **Best Paper Award**.

[CI-25] K. Adrian, P. Chocron, R. Confalonieri, X. Ferrer, and J. Giráldez-Cru. Link Prediction in Evolutionary Graphs - The Case Study of the CCIA Network. In À. Nebot, X. Binefa, and R. L. de Mántaras, editors, *Proceedings of the 19th International Conference of the Catalan Association for Artificial Intelligence, Barcelona, Catalonia, Spain, October 19-21, 2016*, volume 288 of *Frontiers in Artificial Intelligence and Applications*, pages 187–196. IOS Press, 2016. ISBN: 978-1-61499-695-8. DOI: 10.3233/978-1-61499-696-5-187.

[CI-26] D. Porello, N. Troquard, R. Confalonieri, P. Galliani, O. Kutz, and R. Peñaloza. Repairing Socially Aggregated Ontologies Using Axiom Weakening. In B. An, A. L. C. Bazzan, J. Leite, S. Villata, and L. W. N. van der Torre, editors, *Proceedings of the 20th International Conference on Principles and*

Practice of Multi-Agent Systems PRIMA 2017, Nice, France, October 30 - November 3, 2017, volume 10621 of *Lecture Notes in Computer Science*, pages 441–449. Springer, 2017. ISBN: 978-3-319-69130-5. DOI: 10.1007/978-3-319-69131-2_26.

[CI-27] D. Porello, N. Troquard, R. Peñaloza, R. Confalonieri, P. Galliani, and O. Kutz. Two Approaches to Ontology Aggregation Based on Axiom Weakening. In J. Lang, editor, *Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence, IJCAI 2018, July 13-19, 2018, Stockholm, Sweden*, pages 1942–1948. ijcai.org, 2018. ISBN: 978-0-9992411-2-7. DOI: 10.24963/ijcai.2018/268. **(CORE: A*, Acceptance Rate: 20.5%)**.

[CI-28] N. Troquard, R. Confalonieri, P. Galliani, R. Peñaloza, D. Porello, and O. Kutz. Repairing Ontologies via Axiom Weakening. In S. A. McIlraith and K. Q. Weinberger, editors, *Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence, (AAAI-18), New Orleans, Louisiana, USA, February 2-7, 2018*, pages 1981–1988. AAAI Press, 2018. **(CORE: A*, Acceptance Rate: 24.6%)**.

[CI-29] P. Galliani, O. Kutz, and R. Confalonieri. A Roadmap towards Tuneable Random Ontology Generation Via Probabilistic Generative Models. In D. Aveiro, J. L. G. Dietz, and J. Filipe, editors, *Proceedings of the 10th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, IC3K 2018, Volume 2: KEOD, Seville, Spain, September 18-20, 2018*, pages 349–355. SciTePress, 2018. ISBN: 978-989-758-330-8. DOI: 10.5220/0006961103490355.

[CI-30] R. Confalonieri, T. R. Besold, T. Weyde, K. Creel, T. Lombrozo, S. T. Mueller, and P. Shafto. What makes a good explanation? Cognitive dimensions of explaining intelligent machines. In A. K. Goel, C. M. Seifert, and C. Freksa, editors, *Proceedings of the 41th Annual Meeting of the Cognitive Science Society, CogSci 2019: Creativity + Cognition + Computation, Montreal, Canada, July 24-27, 2019*, pages 25–26. cognitivesciencesociety.org, 2019. ISBN: 0-9911967-7-5.

[CI-31] R. Confalonieri, T. Weyde, T. R. Besold, and F. M. del Prado Martín. Trepan Reloaded: A Knowledge-driven Approach to Explaining Black-box Models. In *Proceedings of the 24th European Conference on Artificial Intelligence*, volume 325 of *Frontiers in Artificial Intelligence and Applications*, pages 2457–2464. IOS press, 2020. DOI: 10.3233/FAIA200378. **(CORE: A, Distinguished Paper Award)**.

[CI-32] P. P. Htun, M. Boschetti, A. Buriro, R. Confalonieri, B. Sun, A. Htwe, and T. Tillo. A lightweight approach for wood hyperspectral images classification. In *2021 IEEE International Conference on Multimedia & Expo Workshops (ICME)*, pages 1–4, Los Alamitos, CA, USA, 2021. IEEE Computer Society. DOI: 10.1109/ICMEW53276.2021.9455943.

[CI-33] E. Mariotti, J. M. Alonso, and R. Confalonieri. A framework for analyzing fairness, accountability, transparency and ethics: A use-case in banking services. In *30th IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2021, Luxembourg, July 11-14, 2021*, pages 1–6. IEEE, 2021. DOI: 10.1109/FUZZ45933.2021.9494481.

[CI-34] R. Confalonieri, T. Weyde, T. R. Besold, and F. M. del Prado Martín. Using ontologies to enhance human understandability of global post-hoc explanations of black-box models. In *30th International Joint Conference on Artificial Intelligence (IJCAI-21)*, 2021. **(Journal Track Paper)**.

[CI-35] R. Confalonieri, P. Galliani, O. Kutz, D. Porello, G. Righetti, and N. Troquard. Almost certain termination for *ALC* weakening. In G. Marreiros, B. Martins, A. Paiva, B. Ribeiro, and A. Sardinha, editors, *Progress in Artificial Intelligence - 21st EPIA Conference on Artificial Intelligence, EPIA 2022, Lisbon, Portugal, August 31 - September 2, 2022, Proceedings*, volume 13566 of *Lecture Notes in Computer Science*, pages 663–675. Springer, 2022. DOI: 10.1007/978-3-031-16474-3_54. **(Best Paper Award)**.

[CI-36] G. Righetti, D. Porello, and R. Confalonieri. Evaluating the interpretability of threshold operators. In Ó. Corcho, L. Hollink, O. Kutz, N. Troquard, and F. J. Ekaputra, editors, *Knowledge Engineering and Knowledge Management - 23rd International Conference, EKAW 2022, Bolzano, Italy, September 26-29, 2022, Proceedings*, volume 13514 of *Lecture Notes in Computer Science*, pages 136–151. Springer, 2022. DOI: 10.1007/978-3-031-17105-5_10. **(Nominee for Best Paper Award)**.

Papers in Refereed International Workshops

[WI-1] R. Confalonieri, J. Domingue, and E. Motta. Orchestration of Semantic Web Services in IRS-III. In *First AKT Workshop on Semantic Web Services, KMI, The Open University, Milton Keynes, UK, December 8, 2004*, CEUR Workshop Proceedings. CEUR-WS.org, 2004.

[WI-2] R. Confalonieri, J. C. Nieves, and J. Vázquez-Salceda. A Preference Meta-Model for Logic Programs with Possibilistic Ordered Disjunction. In *Proc. of the 2nd Workshop on Software Engineering for Answer Set Programming (SEA'09), Postdam, Germany, 14 September 2009*, volume 546 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2009.

[WI-3] R. Confalonieri and J. C. Nieves. Nested Logic Programs with Ordered Disjunction. In *Proc. of the Sixth Latin American Workshop on Non-Monotonic Reasoning (LANMR 2010)*, volume 677 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2010.

[WI-4] R. Confalonieri, M. Schorlemmer, E. Plaza, M. Eppe, O. Kutz, and R. Peñaloza. Upward Refinement for Conceptual Blending in Description Logic: An ASP-based Approach and Case Study in $\mathcal{EL}^{++}$. In *Proc. of the Joint Ontology Workshops 2015 Episode 1: The Argentine Winter of Ontology co-located with the 24th International Joint Conference on Artificial Intelligence (IJCAI 2015), Buenos Aires, Argentina, July 25-27, 2015*, volume 1517 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2015.

[WI-5] R. Confalonieri, M. Schorlemmer, O. Kutz, R. Peñaloza, E. Plaza, and M. Eppe. Conceptual Blending in $\mathcal{EL}^{++}$. In *Proc. of the 29th International Workshop on Description Logics, Cape Town, South Africa, April 22-25, 2016*, volume 1577 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2016.

[WI-6] M. Schorlemmer, R. Confalonieri, and E. Plaza. The Yoneda Path to the Buddhist Monk Blend. In *Proc. of the Joint Ontology Workshops 2016 Episode 2: The French Summer of Ontology co-located with the 9th International Conference on Formal Ontology in Information Systems (FOIS 2016), Annecy, France, July 6-9, 2016*, volume 1660 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2016.

[WI-7] M. Schorlemmer, R. Confalonieri, and E. Plaza. Coherent Concept Invention. In *Proc. of the Workshop on Computational Creativity, Concept Invention, and General Intelligence (C3GI 2016) co-located with the 28th European Summer School in Logic, Language and Information (ESSLLI 2016), Bozen-Bolzano, Italy, August 20-22, 2016*, volume 1767 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2016.

[WI-8] R. Confalonieri, O. Kutz, P. Galliani, R. Penñaloza, D. Porello, M. Schorlemmer, and N. Troquard. Coherence, Similarity, and Concept Generalisation. In *Proc. of the 30th International Workshop on 29 Description Logics, Montpellier, France, July 18-21, 2017*, volume 1879 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2017.

[WI-9] R. Confalonieri, O. Kutz, P. Galliani, R. Penñaloza, D. Porello, and N. Troquard. Two Applications of Concept Refinement. In *Proc. of the First International Workshop on Comprehensibility and Explanation in AI and ML 2017 co-located with 16th International Conference of the Italian Association for Artificial Intelligence (AI*IA 2017), Bari, Italy, November 16-17, 2017*, volume 2071 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2017.

[WI-10] D. Porello, N. Troquard, R. Peñaloza, R. Confalonieri, P. Galliani, and O. Kutz. Social Mechanisms for the Collective Engineering of Ontologies. In *Seventh International Workshop on Computational Social Choice (COMSOC-2018) Troy, NY, USA, 25-27 June 2018*, 2018.

[WI-11] R. Confalonieri, P. Galliani, O. Kutz, D. Porello, G. Righetti, and N. Troquard. Two Knowledge-driven Approaches to Explaining Black-box Models. In *1st International Workshop on Explainable Logic-Based Knowledge Representation (XLoKR 2020), Online, September 13-14, 2020*, 2020.

[WI-12] R. Confalonieri, P. Galliani, O. Kutz, D. Porello, G. Righetti, and N. Troquard. Towards Even More Irresistible Axiom Weakening. In *Proc. of the 33rd International Workshop on Description Logics (DL 2020), Online, September 12-14, 2020*, volume 2663 of *CEUR Workshop Proceedings*. CEUR-WS.org, 2020.

[WI-13] R. Confalonieri, P. Galliani, O. Kutz, D. Porello, G. Righetti, and N. Troquard. Towards Knowledge-driven Distillation and Explanation of Black-box Models. In *Proc. of the International Workshop on Data meets Applied Ontologies in XAI (DAO-XAI 2021), Bratislava, September 18-19, 2021*, CEUR Workshop Proceedings. CEUR-WS.org, 2021.

[WI-14] G. Righetti, D. Porello, and R. Confalonieri. Evaluating the interpretability of threshold operators (extended abstract). In *Proc. of the 35th International Workshop on Description Logics (DL 2022), August 7–10, 2022 · Haifa, Israel, FLoC 2022*, CEUR Workshop Proceedings. CEUR-WS.org, 2022.

[WI-15] R. Confalonieri and A. Janes. A technology transfer portal to promote industry-academia collaboration in south-tyrol. In G. Kotsis, A. M. Tjoa, I. Khalil, B. Moser, A. Taudes, A. Mashkoor, J. Sametinger, J. M. Gil, F. Sobieczky, L. Fischer, R. Ramler, M. Khan, and G. Czech, editors, *Database and Expert Systems Applications - DEXA 2022 Workshops - 33rd International Conference, DEXA 2022, Vienna, Austria, August 22-24, 2022, Proceedings*, volume 1633 of *Communications in Computer and Information Science*, pages 221–231. Springer, 2022. DOI: 10.1007/978-3-031-14343-4_21.

[WI-16] D. Porello, G. Righetti, N. Troquard, R. Confalonieri, and O. Kutz. An ontological modelling of prototype theories. In C. Beierle, K. Sauerwald, F. Schwarzentruber, and F. Stolzenburg, editors, *Proceedings of the 9th Workshop on Formal and Cognitive Reasoning co-located with the 46th German Conference on Artificial Intelligence (KI 2023), Berlin, Germany, September 26, 2023*, volume 3500 of *CEUR Workshop Proceedings*, pages 20–31. CEUR-WS.org, 2023.

Theses

[T-1] R. Confalonieri. Un'Ontologia per l'Orchestrazione di Servizi Web Semantici. Master's thesis, Dipartimento di Scienze dell'Informazione, Università degli Studi di Bologna, 2005.

[T-2] R. Confalonieri. *The Role of Preferences in Logic Programming: Non-monotonic Reasoning, User Preferences, Decision under Uncertainty.* PhD thesis, Department of Computer Science, Universitat Politècnica de Catalunya, 2011. European Ph.D.

Technical Reports

[TR-1] R. Confalonieri, J. C. Nieves, and J. Vázquez-Salceda. Logic Programs with Possibilistic Ordered Disjunction. Research Report LSI-09-19-R, Computer Science Department, Polytechnic University of Catalonia, May 2009.

[TR-2] J. Lopes, S. Álvarez-Napagao, R. Confalonieri, and J. Vázquez-Salceda. USE: a Multi-Agent User-Driven Recommendation System for Semantic Knowledge Extraction. Research Report LSI-09-20-R, Computer Science Department, Polytechnic University of Catalonia, June 2010.

[TR-3] R. Confalonieri, J. C. Nieves, and J. Vázquez-Salceda. Towards an Implementation of a Preference- and Uncertain-Aware Solver Using Answer Set Programming. Research Report LSI-10-16-R, Computer Science Department, Polytechnic University of Catalonia, June 2010.

[TR-4] R. Confalonieri, T. Weyde, T. R. Besold, and F. M. del Prado Martín. Trepan Reloaded: A Knowledge-driven Approach to Explaining Artificial Neural Networks. CoRR Technical Report arXiv:1906.08362v1, arXiv.org e-Print archive, 2019.

[TR-5] L. Longo, M. Brcic, F. Cabitza, J. Choi, R. Confalonieri, J. D. Ser, R. Guidotti, Y. Hayashi, F. Herrera, A. Holzinger, R. Jiang, H. Khosravi, F. Lécué, G. Malgieri, A. Páez, W. Samek, J. Schneider, T. Speith, and S. Stumpf. Explainable artificial intelligence (XAI) 2.0: A manifesto of open challenges and interdisciplinary research directions. *CoRR*, abs/2310.19775, 2023. DOI: 10.48550/ARXIV.2310.19775.

[TR-6] R. Confalonieri and G. Guizzardi. On the multiple roles of ontologies in explainable AI. *CoRR*, abs/2311.04778, 2023. DOI: 10.48550/ARXIV.2311.04778.

Padova, 15 November, 2024 Roberto Confalonieri