

# Curriculum Vitae et Studiorum

Roberto Confalonieri

July 2021

## SHORT BIO:

Roberto Confalonieri received his Ph.D. in Artificial Intelligence (with distinction) from the Polytechnic University of Catalonia in 2011. He is Assistant Professor at the Faculty of Computer Science of UniBZ since 2020. 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 UniBZ where he acquired and directed several research projects and collaborations with industries (raising a total amount of €1.732.353,26 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 is the PI of 2 research projects (one European); he participated in 4 European projects, and in a number of (Italian) national projects and collaborations with industries. He has published around 50 peer-reviewed articles in AI top conferences (IJCAI, AAAI, ECAI) and journals (AIJ, EAAI, AMAI). He co-edited the book ‘Concept Invention’ published by Springer in 2018. He is associate editor of the Cognitive Systems Research journal published by Elsevier. He is co-editing the special issue on ‘The Role of Ontologies and Knowledge in Explainable AI’ to be published in the Semantic Web Journal published by IOS Press.

He regularly organises scientific events: he was co-chair of an invited symposium at CogSci 2019, of the series of international workshops of Methods for Interpretation of Industrial Event Logs (MIEL @IDEAL 2018, MIEL @BPM 2019), of Data meets Applied Ontologies (DAO @JOWO 2017, DAO-SI @JOWO 2019, DAO-XAI@BASK 2021), and C3GI 2018. He serves as Senior PC and PC member in top-tier AI conference such as IJCAI, AAAI, and ECAI.

In 2020, he received the Italian ASN as ‘Professore II Fascia’ in the scientific sectors 01/B1 (Computer Science) and 09/H1 (Information Processing Systems) respectively, and the Catalan Habilitation as ‘Agregat’ (equivalent to Professore II Fascia). He also holds the Catalan Habilitation as ‘Lector’ since 2013.

His main research topics are in AI, particularly Trustworthy and Explainable AI, Knowledge Representation and Applied Ontologies. A major focus of his work is on human-centred AI, specifically, on the role played by explicit knowledge to provide explanations of black-box models that are human-understandable, reusable in different contexts, and adaptable to stakeholders with different backgrounds.

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# University Academic Curriculum Vitae

## Personal Information

### 1 Personal Information

**Name:** Roberto Confalonieri  
**University:** Free University of Bozen-Bolzano  
**Faculty:** Faculty of Computer Science  
**Telephone:** Office: +39-0471 016 244  
**Email:** roberto.confalonieri@unibz.it  
**Web:** <http://www.inf.unibz.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. Lluís Godó 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'introducció a la programació en la classe de matemàtiques;*

**Supervisor:** Prof. Maria Rosa Massa Esteve (University of Barcelona).

Catalan National Habilitation (Feb. 2013): Tenure-track lecturer (associate professor) in the field of Engineering and Architecture, AQU Catalunya, Spain.

Catalan National Habilitation (Nov. 2020): Associate professor in the field of 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)*.

### 3 Employment and Appointments Held

## Present Appointment

#### 3.1 Present Appointment

Since Sep. 2016: *Lecturer* in the Master of Research in Artificial Intelligence - Universidad Internacional Menéndez Pelayo, Spain.

**Responsibilities:** – teaching 'Answer Set Programming' in the module 'Razonamiento automático' (online, in Spanish); – master's students supervision.

Since Jan. 2020: *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, and decision support systems in application domains such as eCommerce, eHealth, and agriculture;

– teaching and student supervision; – administration and participation in European, and local research projects;

## 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 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.

## 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. He is the Principal Investigator of the H2I project, a research project 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], 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 has also started to investigate the cognitive dimensions that explanations should possess from a social and psychological perspective to foster human-machine interaction [CI-30].

He is also interested in cognitive AI, more specifically in formal-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 particularly focuses on the role concepts play in ontologies, the problem of discovery of newly created concepts [JI-7, JI-8], and the role of concept refinement in concept invention [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 50 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 **12**, and he got **572 citations** (July 2021).

According to Scopus, his **h-index** is **8**, and he got **266 citations** (July 2021).

### 4.4 Coordination and Participation to 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 €1.732.353,26 (ROBUSINTER, PACMEL, REUSE, STORE, ALPINEANNOTATION, ONCONET2, PRO4, COCO, CREED, ONTORATOR, STELLA).

#### 4.4.1 Publicly Funded 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 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 (Greece); 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:** €346.285

**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: ROBUSER: *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 – Sept. 2021: H2I: *Immagini iper-spetttrali 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) (since 01/07/2020)

**Funding body:** EFRE/FESR 2017 research project

**Funding amount:** €352.310,00

**Adopted technologies/competences:** Computer Vision, Deep learning

**Coordinator:** Prof. Tammam Tillo (UniBZ)

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

#### 4.4.2 Commissioned Research Collaborations with Industries

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 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).

Apr. 2018 – Dec. 2019: 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 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)

#### 4.4.3 University 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).
- Jul. 2017 – Sep. 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).
- Jul. 2018 – Sep. 2019: 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).
- Jul. 2018 – Sep. 2019: 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).

#### 4.5 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.

## Other Scientific Achievements

### 5 Other Scientific Achievements

Roberto was awarded with two best paper awards, and a technology transfer award. He has 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).

#### 5.1 Awards

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 VAL-ORTEC 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/>

## 5.2 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 ‘Unternehmensverband 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.

Sep. 2020: *Local Organiser of the Bolzano Summer of Knowledge (BOSK 2020)*, to be held at the Free University of Bozen-Bolzano in September 2020.

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.

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, 14-24 September 2021. Co-organised with D. Calvanese, O. Kutz, and A. Mosca.

## Teaching Experience

## 6 Teaching Experience

Roberto has taught both at the University and Vocational Training level. In 2013 he got the Catalan Habilitation for Tenure-track lecturer; in the same year, he got his 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.

### 6.1 Lecturer of BSc and MSc Level Courses

Spring 2006: *Computer Architecture*, ‘Programming in Assembly’, Università di Bologna, Italy.

**Role:** Teaching 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  
**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  
**Language of teaching:** English.

## 6.2 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 Stucum, Barcelona, Spain.  
**Class level:** Vocational Training in Computer Science.  
**Course load:** 240 hours, 15 Students (approx.).  
**Language of teaching:** Spanish.

## 6.3 Thesis Supervision

Roberto supervised three B.Sc. thesis in Computer Science and Artificial Intelligence, and four M.Sc. thesis in Artificial Intelligence.

### 6.3.1 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  
**Discipline:** Artificial Intelligence
- 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  
**Discipline:** 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  
**Discipline:** Machine Learning, Technology Transfer

### 6.3.2 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

**Discipline:** Artificial Intelligence

**Qualification:** Excellent

2021 *Federated Reinforcement Learning on the Edge*

Free University of Bozen-Bolzano. September 2021 (Estimated). (co-directed with Prof. Antonio Liotta)

**Student:** Hannes Wiedenhofer

**Level:** Master thesis

**Discipline:** Federated Machine Learning, Reinforcement Learning

2021 *A CNN-based Approach for Hyperspectral Images Classification: A Case Study in Wood Fungi Detection*

Free University of Bozen-Bolzano. September 2021 (Estimated). (co-directed with Prof. Tammam Tillo)

**Student:** Davide Cremonini

**Level:** Master thesis

**Discipline:** Computer Vision, Hyper-spectral image classification, Deep Learning

2021 *Privacy-Preserving Machine Learning via Multi-Party Computation*

Free University of Bozen-Bolzano. September 2021 (Estimated).

**Student:** Andrei Buliga

**Level:** Master thesis

**Discipline:** Machine Learning, Privacy

## 6.4 Teaching Evaluation

The evaluation of the teaching activities (only as lecturer) are attached at the end of this document.

## Other Academic Responsibilities and Memberships

## 7 Other Academic Responsibilities and Memberships

Roberto acted as technology transfer manager and RTD's representative for the Faculty 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.

### 7.1 Internal Appointments to Faculty and University Boards

I have been appointed to various boards of the Free University of Bozen-Bolzano:

- 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.

- Since Mar. 2021 *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.

## 7.2 Project Evaluation and other Referee Activities

2021: Participation as an expert to the selection process for project proposals submitted to the *Academy of Finland's Research Council for Natural Sciences and Engineering* Frontier AI Technologies review panel.

## 7.3 Editorial Activity

Since Feb. 2020: Member of the Editorial Board of the *Cognitive Research Science Journal* published by Elsevier.

Since Mar. 2020: Member of the Editorial Board of the *AI - Open Access Journal* published by MDPI.

May 2021-Jul. 2022 Co-editor of the special issue of the *Semantic Web Journal* on 'The Role of Ontologies and Knowledge in Explainable Artificial Intelligence'.

## 7.4 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, November 14–16, 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*

- *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

- *DL 2021*. The 34th International Workshop on Description Logics, DL 2021, Bratislava, Slovakia, September 2021.
- *AAAI 2021*. 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, 2021.

### 7.5 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 Computational Intelligence Magazine;

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);

### 7.6 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

## 8 Publications

The publications are listed at the end of this document.

## Publications About the Applicant

## 9 Publications 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.

**10 Further Data****10.1 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.

**10.2 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.

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

### 10.3 Technical Specialisations

2011: *Machine Learning*, Coursera; This course provides an introduction to the most common techniques of machine learning (i.e., supervised vs unsupervised machine learning, recommendation algorithms, etc.);

2018: *Big Data Specialisation*, Coursera; The Big Data Specialisation is designed to gain an understanding of what insights big data can provide through hands-on experience with the tools and systems used by big data scientists and engineers;

2018: *Deep Learning Specialisation*, Coursera. The Deep Learning Specialisation is designed to prepare learners to participate in the development of cutting-edge AI technology, and to understand the capability, the challenges, and the consequences of the rise of deep learning.

## Entrepreneurship 11 Entrepreneurship

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).

## Languages 12 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

- [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.

### 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.
- [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.
- [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.

- [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>.
- [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*, 2021. DOI: <https://doi.org/10.1016/j.artint.2021.103471>.

### Book Chapters

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- [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.
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Bolzano, July 12, 2021

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