

# Diego Calvanese

## Curriculum Vitae

May 2017

Born in Innsbruck, Austria in 1966. Married, 2 children.

### Education

1984 Highschool diploma with distinction, Innsbruck, Austria.

1985–1990 MSc in Electronic Engineering, Sapienza University of Rome, Italy. Graduation with 110/110 cum laudae.

1992–1995 Ph.D. in Computer Engineering, Dipartimento di Informatica e Sistemistica (DIS), Sapienza University of Rome, Italy.

Languages: Italian and German: native. English: IELTS level C2.

### Employment and Appointments Held

02/1991 – 07/1992 Responsible for software development at “Ionen-Technik”, Innsbruck, Austria.

09/1992 – 03/1993 Development of an expert system at “Computer and Microimage”, Rome, Italy.

10/1994 – 07/1995 Visiting Scholar at Department of Theoretical Computer Science, Technical University of Aachen (RWTH), Germany.

11/1996 – 02/1998 Postdoctoral Fellow at DIS, Sapienza University of Rome, Italy.

03/1998 – 08/2000 Postdoctoral Scholarship at DIS, Sapienza University of Rome, supported by three awards from the Italian Research Council, Italy.

09/2000 – 10/2003 Ricercatore (tenured assistant professor) in research area ING-INF/05, at the DIS, Sapienza University of Rome, Italy.

11/2003 – 12/2014 Tenured associate professor in research area ING-INF/05 at the Faculty of Computer Science, Free University of Bozen-Bolzano, Italy.

12/2013 Italian National Habilitation as full professor in the Scientific Sector 09/H1 (Information Processing Systems).

01/2014 Italian National Habilitation as full professor in the Scientific Sector 01/B1 (Computer Science).

since 01/2015 Tenured full professor in research area ING-INF/05 at the Faculty of Computer Science, Free University of Bozen-Bolzano, Italy.

**Research Interests.** Diego Calvanese is a member of the Research Centre for Knowledge and Data (KRDB) at the Faculty of Computer Science of the Free University of Bozen-Bolzano, where he carries out research on Knowledge Representation in Artificial Intelligence, Databases, Information Systems, and Business Process Modeling. Specifically, over the past years he has been active in the following research areas:

- ontology-based data access, which is concerned with the development of techniques and tools for the efficient access to large data sources mediated through an ontology;
- study of semantic and computational properties of formalisms for the representation of structured knowledge, such as description logics, which provide the formal underpinning to the ontology languages standardized by the World Wide Web Consortium (W3C); in particular, he has investigated both lightweight and expressive variants of Description Logics, and the correspondences between formalisms used for information systems analysis and logics used in knowledge representation;
- business-process and service modeling, verification, and synthesis; in particular study of process formalisms that take into account both the behavioural aspects and the data component of the modeled systems;
- information integration and semantic inter-operation between systems; in particular, integration of heterogeneous data sources, data integration in the presence of constraints, ontology integration, data warehousing, and peer-to-peer data management;
- query processing over graph databases; in particular, view-based query rewriting and answering and its correspondence with constraint satisfaction problems;
- representation of and search in documents and texts; in particular, representation of structured documents, digital libraries, and representation of textual knowledge;
- planning in the presence of incomplete information.

He has been the coordinator and principal investigator of several international, national, and local research projects in the areas of knowledge representation, data management, and business process management, acquiring over 2,200,000€ of research funds. In particular, he has been the coordinator of the EU FP6 FET STREP project TONES (*Thinking Ontologies*), and of the Euregio project KAOS (*Knowledge-aware Operational Support*), and principal investigator in the Italian PRIN project NGS (*New technologies and tools for the integration of Web search services*), in the EU FP7 STREP project ACSI (*Artifact-Centric Service Interoperation*), and in the EU FP7 IP project Optique (*Scalable End User Access to Big Data*).

In the above research areas, he has given important scientific contributions, widely recognized at the international level. He is the author of more than 300 publications in international journals, conferences, and workshops, among which the most prestigious ones in the respective areas. He is one of the editors of the *Description Logic Handbook*, which has become the reference book for the foundations of semantic oriented technologies for the Web. He has established research collaborations with well known researchers, such as Moshe Y. Vardi (Rice University, USA), Richard B. Hull (IBM Research, USA), Thomas Eiter (University of Vienna, Austria), Marcelo Arenas (UPC Chile), Ernest Teniente (UPC, Spain) Franz Baader (University of Dresden, Germany), Alexander Borgida (Rutgers University, USA), and Michael Zakhariashev (Birkbeck College London, UK).

The international recognition of the research that Diego Calvanese has carried out is also witnessed by his bibliometric data: on 14/5/2017 Google Scholar reports for Diego Calvanese more than 25000 citations (of which almost 10000 in the last 5 years), an h-index of 66, and an i10-index of 188.

In 2013, he received the first *South-Tyrolean Scientific Prize*, in recognition of extraordinary achievements in science and research. In 2015 he was nominated *Fellow of the European Association for Artificial Intelligence* (EurAI, formerly ECCAI).

**Scientific Activity.** He is an active member of the scientific community in the areas of Artificial Intelligence and Databases, and in Computer Science in general. He is an associate editor of the two most prestigious journals in the area of Artificial Intelligence, namely the *Artificial Intelligence Journal* (AIJ) and of the *Journal of Artificial Intelligence Research* (JAIR), and a member of the editorial board of the IOS Press series *Studies on the Semantic Web*. He is a member of the Executive Committee of the *Symposium on the Principles of Database Systems* (PODS), the Steering Committee of the *Int. Conf. on Web Reasoning and Rule Systems* (RR), the *Description Logic Steering Committee*, and the Advisory Team of the *CEUR Workshop Proceedings Series*. He has contributed to the organization of many conferences and scientific events, among which co-chair of KRDB 2002, technical organization chair of VLDB 2001, organization chair of ICDT 2003, co-chair of DL 2003, co-chair of SEBD 2005, co-chair of the 8th EDBT Summer School in 2007, PC co-chair of RR 2008, local chair of RR 2010, PC co-chair of SWAP 2010, area chair of KR 2012, co-organizer of a 2013 Dagstuhl Seminar, area chair of CIKM 2014, co-organizer and PC co-chair of IRCDL 2015, PC co-chair of DL 2015, PC chair of ACM PODS 2015, and general chair of the 28th ESSLLI Summer School in 2016. He served on more than 100 program committee roles for international events, among which prestigious international conferences such as PODS, ICDT, ICDE, IJCAI, AAAI, KR, ECAI, CIKM, EDBT, ER, ISWC, and ICSSOC.

He has been invited many times to present his research work, and has been keynote speaker at PODS 2013, AIMS 2014, JELIA 2014, DL 2016, AMW 2016.

**Teaching Activity and Institutional Duties.** He has carried out a wide range of teaching and academic activities, including teaching several courses at the BSc, MSc, and PhD level on databases, knowledge representation, information integration, conceptual modeling, theory of computing, languages and compilers, formal languages, and foundations of programming. He is the author of several university textbooks on the foundations of programming.

He has been the supervisor or co-supervisor of 8 PhD students, 6 of which already successfully graduated at the Faculty of Computer Science of the Free University of Bozen-Bolzano.

He has been appointed to various boards of the Free University of Bozen-Bolzano:

03/2004 – 10/2007 Director of the MSc in Computer Science;

10/2010 – 12/2013 Representative for the Faculty of Computer Science in the Central Research Committee of the Free University of Bozen-Bolzano;

Since 01/2014 Director of the PhD Program in Computer Science;

Since 02/2015 Vice-dean for Research of the Faculty of Computer Science.

## Selected Publications

- [1] F. Baader, D. Calvanese, D. McGuinness, D. Nardi, and P. F. Patel-Schneider, editors. *The Description Logic Handbook: Theory, Implementation, and Applications*. Cambridge University Press, 2nd edition, 2007.
- [2] D. Calvanese, M. Lenzerini, and D. Nardi. Unifying class-based representation formalisms. *J. of Artificial Intelligence Research*, 11:199–240, 1999.
- [3] D. Calvanese, T. Catarci, and G. Santucci. LAURIN: A distributed digital library of newspaper clippings. *World Wide Web J.*, 4(1/2):5–20, 2001.
- [4] D. Calvanese, G. De Giacomo, M. Lenzerini, and M. Y. Vardi. Rewriting of regular expressions and regular path queries. *J. of Computer and System Sciences*, 64(3):443–465, 2002.
- [5] D. Calvanese, G. De Giacomo, M. Lenzerini, and M. Y. Vardi. Reasoning on regular path queries. *SIGMOD Record*, 32(4):83–92, 2003.
- [6] A. Cali, D. Calvanese, G. De Giacomo, and M. Lenzerini. Data integration under integrity constraints. *Information Systems*, 29(2):147–163, 2004.
- [7] D. Calvanese and G. De Giacomo. Data integration: A logic-based perspective. *AI Magazine*, 26(1):59–70, 2005.
- [8] D. Berardi, D. Calvanese, G. De Giacomo, M. Lenzerini, and M. Mecella. Automatic service composition based on behavioral descriptions. *Int. J. of Cooperative Information Systems*, 14(4):333–376, 2005.
- [9] D. Berardi, D. Calvanese, and G. De Giacomo. Reasoning on UML class diagrams. *Artificial Intelligence*, 168(1–2):70–118, 2005.
- [10] D. Calvanese, L. Dragone, D. Nardi, R. Rosati, and S. M. Trisolini. Enterprise modeling and data warehousing in TELECOM ITALIA. *Information Systems*, 31(1):1–32, 2006.
- [11] D. Calvanese, G. De Giacomo, M. Lenzerini, and M. Y. Vardi. View-based query processing: On the relationship between rewriting, answering and losslessness. *Theoretical Computer Science*, 371(3):169–182, 2007.
- [12] D. Calvanese, G. De Giacomo, D. Lembo, M. Lenzerini, and R. Rosati. Tractable reasoning and efficient query answering in description logics: The *DL-Lite* family. *J. of Automated Reasoning*, 39(3):385–429, 2007.
- [13] A. Poggi, D. Lembo, D. Calvanese, G. De Giacomo, M. Lenzerini, and R. Rosati. Linking data to ontologies. *J. on Data Semantics*, X:133–173, 2008.
- [14] D. Calvanese, G. De Giacomo, and M. Lenzerini. Conjunctive query containment and answering under description logics constraints. *ACM Trans. on Computational Logic*, 9(3):22.1–22.31, 2008.
- [15] D. Calvanese, G. De Giacomo, D. Lembo, M. Lenzerini, and R. Rosati. Inconsistency tolerance in P2P data integration: An epistemic logic approach. *Information Systems*, 33(4–5):360–384, 2008.
- [16] M. Ortiz, D. Calvanese, and T. Eiter. Data complexity of query answering in expressive description logics via tableaux. *J. of Automated Reasoning*, 41(1):61–98, 2008.
- [17] A. Artale, D. Calvanese, R. Kontchakov, and M. Zakharyashev. The *DL-Lite* family and relations. *J. of Artificial Intelligence Research*, 36:1–69, 2009.
- [18] D. Calvanese, G. De Giacomo, D. Lembo, M. Lenzerini, A. Poggi, M. Rodriguez-Muro, R. Rosati, M. Ruzzi, and D. F. Savo. The Mastro system for ontology-based data access. *Semantic Web Journal*, 2(1):43–53, 2011. Listed among the **5 most cited papers in the first five years of the *Semantic Web Journal***.
- [19] D. Calvanese, G. De Giacomo, M. Lenzerini, and R. Rosati. View-based query answering in description logics: Semantics and complexity. *J. of Computer and System Sciences*, 78:26–46, 2012.
- [20] A. Queralt, A. Artale, D. Calvanese, and E. Teniente. OCL-Lite: Finite reasoning on UML/OCL conceptual schemas. *Data and Knowledge Engineering*, 73:1–22, 2012.
- [21] D. Calvanese, G. De Giacomo, D. Lembo, M. Lenzerini, and R. Rosati. Data complexity of query answering in description logics. *Artificial Intelligence*, 195:335–360, 2013.
- [22] E. Kharlamov, D. Zheleznyakov, and D. Calvanese. Capturing model-based ontology evolution at the instance level: The case of *DL-Lite*. *J. of Computer and System Sciences*, 79(6):835–872, 2013.
- [23] D. Calvanese, G. De Giacomo, M. Lenzerini, and M. Y. Vardi. On simplification of schema mappings. *J. of Computer and System Sciences*, 79(6):816–834, 2013.
- [24] B. Bagheri Hariri, D. Calvanese, M. Montali, G. De Giacomo, R. De Masellis, and P. Felli. Description logic Knowledge and Action Bases. *J. of Artificial Intelligence Research*, 46:651–686, 2013.
- [25] D. Calvanese, M. Ortiz, M. Simkus, and G. Stefanoni. Reasoning about explanations for negative query answers in *DL-Lite*. *J. of Artificial Intelligence Research*, 48:635–669, 2013.
- [26] D. Calvanese, T. Eiter, and M. Ortiz. Answering regular path queries in expressive description logics via alternating tree-automata. *Information and Computation*, 237:12–55, 2014.
- [27] M. Montali and D. Calvanese. Soundness of data-aware, case-centric processes. *Int. J. on Software Tools for Technology Transfer*, 18(5):535–558, 2016.
- [28] M. Arenas, E. Botoeva, D. Calvanese, and V. Ryzhikov. Knowledge base exchange: The case of OWL 2 QL. *Artificial Intelligence*, 238:11–62, 2016.
- [29] D. Calvanese, B. Cogrel, S. Komla-Ebri, R. Kontchakov, D. Lanti, M. Rezk, M. Rodriguez-Muro, and G. Xiao. On-top: Answering SPARQL queries over relational databases. *Semantic Web Journal*, 8(3):471–487, 2017. ***Semantic Web Journal* outstanding paper award for 2016.**