# Giuseppe De Giacomo Curriculum Vitae

June 2016

Born: August 8, 1965, Rome (Italy),

**Married:** with Claudia Abbondanza, since 1993, two children

**Current Position**: Full Professor at Sapienza University of Rome, Italy

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# Education:

- Graduated at Sapienza University of Rome in 1991 (Laurea in Ingegneria Elettronica);

- PhD in Computer Science and Engineering at Sapienza University of Rome in 1995 (Supervisor: Maurizio Lenzerini)

# **Academic & Research Appointments:**

1990 – 1991: Erasmus Visiting Student at University of Bristol in 1990/91 with John W.

Llovd.

1993 – 1994: Visiting Scholar at Stanford University with Yoav Shoham

1996 & 1997: Research associate at University of Toronto with Hector Levesque and Ray

Reiter

1998 – 2001: Assistant Professor at University of Rome La Sapienza 2001 – 2006: Associate Professor at University of Rome La Sapienza 2006 – present: Full Professor at University of Rome La Sapienza

Summer 2008: Visiting researcher at IBM Watson Research Center with Rick Hull 2010 – 2011: Visiting Professor at University of Toronto and York University with

Hector Levesque and Yves Lesperance

Summer 2013: Visiting Professor at University of Melbourne with Adrian Pearce

2003 – 2008: Erasmus Program Scientific Coordinator of the Sapienza Engineering School 2011 – 2014: Director of the PhD Program in Engineering in Computer Science

at Sapienza

# Main Research Areas:

Knowledge Representation and Reasoning, Description Logics, Ontology Languages, Reasoning about Actions, Al Planning, Cognitive Robotics, Database Management, Data Integration, Service Composition, Verification and Synthesis in Presence of Data.

# Honors:

- ACM Fellow (http://awards.acm.org/award\_winners/degiacomo\_5943097.cfm), since 2015
- AAAI Fellow (http://www.aaai.org/Awards/fellows-list.php), since 2016
- EurAl Fellow (https://www.eurai.org/awards\_and\_grants/fellows), since 2012
- IBM Open Collaborative Faculty Award, 2009
- IBM Open Collaborative Faculty Award, 2010
- University of Melbourne Miegunyah Distinguished Visiting Fellowship, visit in 2013

- Best paper award at 7th international Conference on Web Reasoning and Rule Systems, 2013
- Most influential paper in the decade at th 11th International Conference on Service Oriented Computing for the paper "Automatic Composition of E-services That Export Their Behavior" published at ICSOC'03, 2013.
- Award Sapienza 2013 for the research project "Spriritles: Spiritlet-based Smart Spaces", 2013

**Research accomplishments:** Giuseppe De Giacomo's research activity has concerned theoretical, methodological and realization aspects in different areas of CS and Al. Below the main accomplishments are listed.

- 1. Expressive Description Logics. His work on expressive description logics based on the correspondence with propositional dynamic logics and mu-calculus, started with his PhD thesis, is at the base of the revolution in the field happened at the end of '90. In particular, it shaped the theoretical landscape of such logics over which enterprises such as OWL (Ontology Web Language) could flourish in the 2000's. Notably that work also closed several open questions on computational aspects of introducing unusual constructs in modal logic such as "graded modalities" and "nominals".
- 2. Query Answering in Description Logics. Together with Maurizio Lenzerini and Diego Calvanese he wrote the first paper on the decidability of answering conjunctive queries over description logics knowledge bases at PODS'97. Since then, query answering in description logics has become one of the main research themes of the field.
- 3. *DL-lite and Ontology Based Data Access*. He is one of the inventors of the lightweight description logic DL-lite, which is tailored towards ontology based data access and integration over large data sources. Such study has directly influenced the OWL 2 QL profile in the OWL 2 W3C standard. Interestingly the first ideas to get these results were based on his work on partial evaluation for logic programs done in his master thesis as an ERASMUS student at University of Bristol, UK, under the supervision of John Lloyd. The journal paper introducing DL-lite appeared in JAR'07 (1009 citations according to Google Scholar). The most recent journal paper on the subject appeared in AIJ, in 2013.
- 4. Reasoning on UML Class Diagrams. He worked on the formalization in logic of a variety of class-based conceptual models. The most prominent result on this line of research is a sound, complete and computationally optimal technique for reasoning on UML class diagrams. Interestingly, expressive description logics could be used to show both EXPTIME-hardness and EXPTIME-membership of reasoning on UML class diagram. The AIJ 2005 paper (513 citations according to Google Scholar) on this research has been one of the most downloaded AIJ papers for 2005.
- 5. Data Integration. He is internationally renowned for his contributions to data Integration, which is one discipline of Data Management dealing with the principles and the techniques for combining information residing at different sources. Data integration is highly relevant, from both the scientific and the industrial point of view, and is often cited as one of the biggest challenges that Information Technology currently faces. His contributions in the field are characterized by a mixture of elements coming from database theory, data management, knowledge representation and Al. Of particular relevance are his contributions on the analysis of peer-to-peer systems in terms of logics of knowledge, and, most prominently, the work on Semantic Data Integration, an approach pioneered by Giuseppe De Giacomo's group where ontologies, typically expressed in description logics are used to formally capture a conceptual view of the data which are then linked through sophisticated forms of mappings to actual data sources. Advancement in this fields are also linked (and in fact motivated) to the development of lightweight description logics such as DL-lite.
- 6. Graph Databases. He developed together with Diego Calvanese, Maurizio Lenzerini and

Moshe Vardi a rich theory of regular path query processing over graph databases, which merges elements coming from automata theory with elements coming from Constraint Satisfaction. Through such techniques problems such as query answering using views, query rewriting, view-based containment, losslessness, and perfectness of rewritings have been addressed for (several extension of) regular path queries. It is worth noting that regular path queries in the context of graph databases play a basic role analogous to that of conjunctive queries for relational databases. Indeed they are the basic component of all query languages over graph databases including the ones for structured, semistructured and XML databases.

- 7. ConGolog and Reasoning about Actions. He has an interest in Reasoning About Actions since when he visited Yoav Shoham in Stanford for 8 months in 1993/94 during his PhD. Such interest flourished when he visited Hector Levesque and Ray Reiter at University of Toronto in 1996 and then again in 1997 and in 1999. He contributed to development of what can be called the Toronto School in Situation Calculus. In particular his work on the semantics of the concurrent version (ConGolog) of the Golog high-level logic programming language based on the Situation Calculus played a crucial role in later work in Situation Calculus and in languages for Cognitive Robotics. The AIJ paper on ConGolog is one of the most cited papers on Situation Calculus with 614 citations. It is also worth mentioning that he was the organizer of the first Cognitive Robotics Workshop held as a 1998 AAAI Fall Symposium and which then became the first of an established series. He is continuing to contribute to Situation Calculus and Reasoning about Actions, and recently together with Fabio Patrizi and Yves Lesperance (York University, Toronto) he devised situation-bounded action theories. These are standard basic action theories with the additional constraints that the size of the extension of fluents in every situation must be bounded, though such an extension changes from situation to situation. Such action theories give rise to infinite transition systems that can be faithfully abstracted into finite ones, making verification decidable. The work on this issue includes KR'12, IJCAI'13, AAMAS'14, ECAI'14, AIJ'16, AAAI'16, KR'16, IJCAI'16, AIJ'16.
- 8. AI Planning. He is well recognized for is work on nonstandard form of AI planning. In particular he has done pioneering work of plan synthesis from LTL specifications (ECP'99, KR'02), and recently on forms of generalized plan synthesis (IJCAI'11, ICAPS'13), i.e., synthesis of plans that work simultaneously in several distinct domains. Also he has studied planning for mu-calculus specifications via model checking of game structures (AAAI'10), and he has drawn connections between forms of planning starting from available components and service compositions (IJCAI'07, AAAI'07, KR'08), and lately between certain forms of planning and discrete event control synthesis (AAMAS'12, IJCAI'13). Finally together with Moshe Vardi and others he is studying system specification, verification and synthesis in LTL and its extension LDL on finite traces, IJCAI'13, AAAI'14, BPM'14, CAiSE'15, IJCAI'15, AIJ'16, IJCAI'16.
- 9. Service composition. Together with Massimo Mecella and others he has developed one of the most prominent techniques for composition of stateful services, which has been later named the "Roman Model" after the name used for it by Rick Hull in several tutorials. The main ideas behind the Roman Model is reusing and repurposing fragments of the computation performed by available services. Such an idea has attracted interest also in AI where it has laid the bases for a novel form of agent-behavior automated synthesis starting from available components (see connection with AI planning). The original paper on the Roman Model appeared at ICSOC'03 (the first of a now established series of conferences) and is one of the most cited papers on foundations of service compositions (with 498 citations according to Google Scholar). The most recent journal papers on the subject appeared on AIJ'13, and AIJ'16.
- 10. Process Verification and Synthesis in Presence of Data. He has recently focused on studying process verification and synthesis from temporal specification in presence of data. The presence of data, which may grow unboundedly, makes such processes infinite state. However most previous research infinite state systems does not apply, since it is mostly concern with recursive control rather than data, which are either ignored or finitely abstracted. In this area he has proposed novel techniques that guarantees the possibility under certain assumptions of faithful abstracting such

infinite state systems into a finite one, including a quite promising one based on a connection with the theory of conjunctive queries and data exchange. Such a research is having a practical impact on the formal analysis, verification and synthesis in so called "artifact-based business processes". This work has been published in several papers including ICSOC'10, BPM'11, KR'12, ECAI'12, JAIR'13, PODS'13, RR'13, AAMAS'14, IJCAI'15, KR'16.

**Impact measures:** He is the author of more than 200 publications in international journals, conference and workshop proceedings. Many of these papers are widely cited in the scientific literature. According to Google Scholar, June 2016, his *h-index* is 65 and his *i10-index* is 180. These values are among the highest in Europe in CS and Al. According to a study (based again Google Scholar) on the top CS scientists working in Italy available at http://via-academy.org/, Giuseppe De Giacomo ranked 3rd among the most cited researchers working in Italy.

Projects: He has been involved in several National and European projects, including EU Esprit Project 22469 DWQ - Data Warehouse Quality (1997-1999), EU FP5 IST-2001-34825 SEWASIE -SEmantic Webs and AgentS in Integrated Economies (2001-2004), EU FP5 IST-2001-33570 INFOMIX - Boosting Information Integration (2001-2004), Italian MIUR-funded FIRB 2005 project TOCALIT - Tecnologie Orientate alla Conoscenza per Aggregazioni di Imprese in Internet [Knowledge-based Technologies for Internet-based Enterprises] (2006-2009). He has been involved in several EU project including EU FP6-7603 TONES - Thinking ONtologiES (2005-2008) and EU FP7-ICT-257593 ACSI Artifact-Centric Service Interoperation (2010-2013), as principal investigator of the Università di Roma La Sapienza unit. He is currently participating to EU FP7-IST-IP-3183382012-2016 Scalable End-user Access to Big Data (Optique); He has also been the principal investigator in the following recent international projects: Open Collaboration Research Agreement W0954341 with Rick Hull of IBM T. J. Watson Research Center, NY, on "data aware business processes and operation, through an artifact-centric approach" (2009-2014); UK Royal Society International Joint Project 2009/R2 on "web services automatic synthesis through ATL symbolic model checking", joint with Alessio Lomuscio, Imperial College London; UK Engineering and Physical Sciences Research Council (EPSRC) Project EP/I00520X/1 "Trusted Autonomous Alessio Lomuscio, Imperial College London (2010-2015); Australian Systems" again with Research Council (ARC) Competitive Research Grant - Discovery Project DP120100332 "Optimisation of embedded virtual complex systems by re-using a library of available component" with Sebastian Sardina of RMIT and Maurice Pagnucco of Univ. of Sidney (2012-2014). Project Award Sapienza 2013 "Spriritles: Spiritlet-based Smart Spaces" (2013-2015).

**Teaching**: He has a wide teaching and academic experience. He has taught a large number of graduate and undergraduate courses at the University of Rome La Sapienza on

- Software Engineering,
- Object-oriented Programming,
- Formal Methods,
- Data Bases.
- Data Integration,
- Service Composition,
- Knowledge Representation.

He has taught PhD courses in European summer schools, including ESSLLI '03 "Description Logics for Conceptual Data Modeling in UML" with Diego Calvanese; ESSLLI'05 "Logic-based Information Integration" with Riccardo Rosati; INFWEST'07 "Temporal Verification and Synthesis of Reactive Systems" with Massimo Mecella, Tampere, Finland. He has also given several tutorials at scientific venues such as: "Service Composition: Technologies, Methods and Tools for Synthesis and Orchestration of Composite Services and Processes" with Massimo Mecella at ICSOC'04; "Basis for Automatic Service Composition" with Massimo Mecella and Daniela Berardi at WWW'05;

"Reasoning for Ontology Engineering and Usage" with Diego Calvanese, Matthew Horridge, Ralf Moeller, and Anni-Yasmin Turhan at ISWC'08; "Ontology-based Data Integration" with Claudio Corona and Domenico Fabio Savo at SWAP'08, FAO, Rome, Italy; "Ontology-based Data Integration" with Diego Calvanese at Semantic Days 2009 Conference Stavanger, Norway; "Description Logics for Data Access" with Domenico Lembo at AAAI'10; "Automatic Synthesis & Composition of Agent Behaviors" with Fabio Patrizi and Sebastian Sardina at IJCAI'15; "Methodologies for Ontology Based Data Access Applications" with Domenico Lembo, Antonella Poggi, Valerio Santarelli, and Domenico Fabio Savo.

**Students:** He has supervised a number of PhD students, including Daniela Berardi (2005), Fabio Patrizi (2009), Riccardo De Masellis (2013) and Paolo Felli (2013).

#### Invited talks:

- "Automatic composition synthesis of web services: a conceptual perspective" at MSI'05, Caen, France, 2005;
- "Process integration: Look at how you behave!" at INFINT'07 Bertinoro Workshop on Information Integration, Bertinoro, Italia, October 2007;
- "Ontology Based Data Integration" at IBM Research Center Watson, Hawthorne, NY, USA, August 2008;
- "The Roman model for Service Composition" at INFINT'09 Bertinoro Workshop on Data and Service Integration, Bertinoro, Italia, March 2009;
- "QUONTO: ontology-based data access and integration using relational technology",
  Semantic Days 2009 Conference Stavanger, Norway, May 2009;
- "Automatic Service Composition and Synthesis: the Roman Model" at York University, Toronto, Canada, October 2010;
- "Towards Systems for Ontology-based Data Access and Integration using Relational Technology" at University of Toronto, Canada, October 2010;
- "Automatic Service Composition and Synthesis: the Roman Model" at University of Toronto Canada, October 2010;
- "Conjunctive Queries: Evaluation and Containment" at University of Toronto, Canada, November 2010.
- "Linear Temporal Logics on Finite Traces: Reasoning, Verification, and Synthesis" keynote at 23rd International Conference on Automated Planning and Scheduling (ICAPS'13), Rome, Italy, June 2013.
- "Actions, Processes, and Ontologies" keynote at 26th International Workshop on Description Logics (DL 2013), Ulm, Germany, July 2013.
- "Cognitive Robotics: The science of building intelligent autonomous robots and software agents", Miegunyah Fellow Public Lecture, Melbourne, Australia August 2013
- "Automatic Composition of E-services That Export Their Behavior", talk for the prize as the most influential ICSOC paper in the last 10 years, ICSOC 2013, Berlin, December 2013.
- "Reasoning about data and knowledge-aware processes", Invited talk for Frontiers of Artificial Intelligence at 21<sup>st</sup> European Conference on Artificial Intelligence (ECAI 2014), Prague. August 2014.
- "Verification of Data-Aware Processes", keynote at 11th International Workshop on Web Services and Formal Methods: Formal Aspects of Service-Oriented and Cloud Computing (WS-FM:FASOCC 2014), Eindhoven, September 2014.
- "On Bounded Situation Calculus" invited talk at HYBRIS Workshop, Potsdam, Germany June 2015.
- "Synthesis in Linear-time Dynamic Logic on Finite Traces" keynote at Highlights of Logic, Games and Automata 2015 (Highlights 2015), Prague, Czech Republic, September 2015.
- "Temporal Reasoning in Bounded Situation Calculus" keynote at 22nd International Symposium on Temporal Representation and Reasoning (TIME), Kassel, Germany, September 2015.

- "LTL and LDL on Finite Traces: Reasoning, Verification, and Synthesis" invited talk at the 4<sup>th</sup> International Workshop on Strategic Reasoning (SR'16), New York, USA, July 2016.

**Organization of conferences and workshops**: He regularly serves as a member of the Program Committee of many international conferences and workshops in CS and AI, including PODS, ICDT, IJCAI, KR, AAAI, ECAI, ICAPS, ICSOC, BPM, AAMAS, and ICWS. Also he has been:

- Organizer of 1st Cognitive Robotics Workshop held as AAAI Fall Symposium (CogRob'98)
- Organizer of 2003 International Workshop on Description Logics (DL'03)
- Workshops chair of 24th Conference on Artificial Intelligence (AAAI'10)
- Workshops chair of 25th Conference on Artificial Intelligence (AAAI'11)
- Area chair of 22th International Joint Conference on Artificial Intelligence (IJCAI'11)
- Area chair of 26th Conference on Artificial Intelligence (AAAI'12)
- Local organizer of 13th International Conference on Principles of Knowledge Representation and Reasoning (KR'12)
- Program Chair of 14th International Conference on Principles of Knowledge Representation and Reasoning (KR'14)
- Area chair of 25th International Joint Conference on Artificial Intelligence (IJCAI'16)

# **Membership in Steering Committees:**

2006 – 2009: Steering Committee of the Description Logics Workshop series

2014 – 2016: Steering Committee of KR Inc. organizing the Knowledge Representation and

Reasoning Conference series

2016 – present: Vice President of the Steering Committee of KR Inc.

#### Editorial Boards:

- Journal of Artificial Intelligence Research, Associate Editor (2008-2015)
- Journal of Artificial Intelligence Research, Editorial Board Member (2006-2008)
- Artificial Intelligence, Elsevier, Editorial Board Member (since 2013)
- Artificial Intelligence, Elsevier, Review Editor (since June 2014)
- CoRR Moderator for Artificial Intelligence (since October 2014)
- Acta Informatica, Springer, Editorial Board Member (since 2015)

# Associations (current):

- Lifetime Member of the Association for Computer Machinery (ACM)
- Lifetime Member of Association for Advancement of Artificial Intelligence (AAAI)
- Member of the Italian Association for Artificial Intelligence (AI\*IA)

# **Publications**

#### Journal papers:

- 1. Giuseppe De Giacomo. Intensional query answering by partial evaluation. Journal of Intelligent Information Systems, 7, 205–233. Kluwer Academic Publishers, 1996.
- 2. Giuseppe De Giacomo. Eliminating "converse" from converse PDL. Journal of Logic, Language and Information, 5, 193–208. Kluwer Academic Publishers, 1996.
- 3. Giuseppe De Giacomo, Maurizio Lenzerini. A uniform framework for concept definitions in description logics. Journal of Artificial Intelligence Research, 6, 87–110. Morgan Kaufmann Publishers, 1997.
- 4. Giuseppe De Giacomo, Luca locchi, Daniele Nardi, Riccardo Rosati. A theory and

- implementation of cognitive mobile robots. Journal of Logic and Computation, 6(5): 759–785. Oxford Press, 1999.
- 5. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. Representing and reasoning on XML documents: A description logic approach. Journal of Logic and Computation, 9(3): 295–318. Oxford Press, 1999.
- 6. Xiao Jun Chen, Giuseppe De Giacomo. Reasoning about nondeterministic and concurrent actions: A process algebra approach. Artificial Intelligence, 107, 63–98. Elsevier Science, 1999.
- 7. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. Modeling and querying semistructured data. Networking and Information System Journal, 2(2): 253–273. Hermes Science Publications, 1999.
- 8. Diego Calvanese, Giuseppe De Giacomo, Riccardo Rosati. Data integration and reconciliation in data warehousing: conceptual modeling and reasoning support. Networking and Information System Journal, 2(2): 413–432. Hermes Science Publications, 1999.
- 9. Giuseppe De Giacomo, Riccardo Rosati. Minimal knowledge approach to reasoning about actions and Sensing. Electronic Transactions on Artificial Intelligence Volume 3 (1999), Section C Special Section on Non-Monotonic Reasoning, Actions and Change, pages 1–18. http://www.etaij.org
- 10. Giuseppe De Giacomo, Fabio Massacci. Combining deduction and model checking into tableaux and algorithms for Converse-PDL. Information and Computation, 160(1-2). Academic Press, 2000.
- 11. Giuseppe De Giacomo, Yves Lesperance, Hector J. Levesque. ConGolog, a concurrent programming language based on the situation calculus. Artificial Intelligence, 121(1-2), 109–169. Elsevier Science, 2000.
- 12. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Daniele Nardi, Riccardo Rosati. Data Integration in Data Warehousing. International Journal of Cooperative Information Systems, 10(3): 237–271, World Scientific, 2001.
- 13. Giuseppe De Giacomo, Hector Levesque, Sebastian Sardina. Incremental Execution of guarded theories. ACM Transactions on Computational Logic, 2(4): 495-525, ACM Press, 2001.
- 14. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Moshe Y. Vardi. Rewriting of regular expressions and regular path queries. Journal of Computer and System Sciences, 64(3):443–465, 2002, Academic Press, 2002.
- 15. Andrea Calì, Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. On the role of integrity constraints in data integration. Bull. of the IEEE Computer Society Technical Committee on Data Engineering, 25(3):39–45, IEEE Computer Society Press, 2002.
- 16. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Moshe Y. Vardi. Reasoning on regular path queries. SIGMOD Record, 32(4): 83-92, 2003.
- 17. Andrea Calì, Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. Data integration under integrity constraints. Information Systems, 29(2) 147-163, Elsevier Science, 2004.
- Sebastian Sardina, Giuseppe De Giacomo, Yves, Lesperance, Hector J. Levesque. On the Semantics of Deliberation in IndiGolog: From Theory to Implementation. Annals of Mathematics and Artificial Intelligence, Volume 41, number 2-4, pages 256-299, Kluwer Academic Publishers, 2004.
- 19. Diego Calvanese, Giuseppe De Giacomo, Moshe Y. Vardi. Decidable Containment of Recursive Queries. Theoretical Computer Science, 336(2005): 33-56, Elsevier Science, 2005.

- 20. Diego Calvanese, Giuseppe De Giacomo. Data Integration: a Logic-based Perspective. Al Magazine, AAAI Press, 2005. Volume 26, number 1, pages 59-70, AAAI Press 2005.
- 21. Daniela Berardi, Diego Calvanese, Giuseppe De Giacomo. Reasoning on UML class diagrams. Artificial Intelligence, 168(2005) 70–118, Elsevier Science, 2005.
- 22. Daniela Berardi, Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Massimo Mecella. Automatic Service Composition Based On Behavioral Descriptions. International Journal of Co- operative Information Systems, Vol. 14(4) 333–376, World Scientific, 2005.
- 23. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Moshe Y. Vardi . View-based Query Processing: On the Relationship between Rewriting, Answering and Losslessness. Theoretical Computer Science, vol. 371(3), pp. 169-182, Elsevier Science, 2007.
- 24. Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Riccardo Rosati. Tractable Reasoning and Efficient Query Answering in Description Logics: The DL-Lite family. Journal of Automated Reasoning, vol. 39(3), pp. 385-429, Springer, 2007.
- 25. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. Conjunctive Query Containment and Answering under Description Logics Constraints. ACM Transactions on Computational Logic, 9(3): 22.1-22.31, ACM Press, 2008.
- 26. Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Riccardo Rosati. Inconsistency Tolerance in P2P Data Integration: an Epistemic Logic Approach. Information Systems, 33(4): 360-384, Elsevier Science, 2008.
- 27. Antonella Poggi, Domenico Lembo, Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Riccardo Rosati. Linking Data to Ontologies. Journal on Data Semantics, vol. X, 133-173, Springer, 2008.
- 28. Daniela Berardi, Fahima Cheikh, Giuseppe De Giacomo, Fabio Patrizi. Automatic Service Composition via Simulation. International Journal of Foundations of Computer Science, 19(2): 429-451, 2008.
- 29. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Massimo Mecella, Fabio Patrizi. Automatic service composition and synthesis: the Roman Model Bull. of the IEEE Computer Society Technical Committee on Data Engineering, 31(3):18-22, IEEE Press, 2008.
- 30. Giuseppe De Giacomo, Maurizio Lenzerini, Antonella Poggi, Riccardo Rosati. On Instance-Level Update and Erasure in Description Logic Ontologies. Journal of Logic and Computation. 19(5): 745-770, 2009.
- 31. Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Antonella Poggi, Mariano Rodriguez-Muro, Riccardo Rosati, Marco Ruzzi, Domenico Fabio Savo. The MASTRO System for Ontology-based Data Access. Semantic Web Journal. 2(1):43-53, 2011.
- 32. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Riccardo Rosati. View-based Query Answering in Description Logics: Semantics and Complexity. Journal of Computer and System Sciences 78 (2012) 26-46. 2012.
- 33. Riccardo De Masellis, Giuseppe De Giacomo, Riccardo Rosati. Verification of Conjunctive Artifact-Centric Services. International Journal of Cooperative Information Systems (IJCIS), Vol. 21, No. 2 (2012) 111-139.
- 34. Marco Cadoli, Diego Calvanese, Giuseppe De Giacomo, Toni Mancini: Finite model reasoning on UML class diagrams via constraint programming. Intelligenza Artificiale 7(1): 57-65 (2013)

- 35. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini, Moshe Y. Vardi. On Simplification of Schema Mappings J. of Computer and System Sciences, 2013. 79(6): 816-834 (2013)
- 36. Babak Bagheri Hariri, Diego Calvanese, Marco Montali, Giuseppe De Giacomo, Riccardo De Masellis, Paolo Felli. Description logic Knowledge and Action Bases. J. of Artificial Intelligence Research, 46: 651-686 (2013)
- 37. Diego Calvanese, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Riccardo Rosati. Data Complexity of Query Answering in Description Logics. Artificial Intelligence, 195:335-360, 2013.
- 38. Giuseppe De Giacomo, Fabio Patrizi, Sebastian Sardina. Automatic Behavior Composition Synthesis. Artificial Intelligence, 196:106-142, 2013.
- 39. Giuseppe De Giacomo, Yves Lesperance, Fabio Patrizi, Stavros Vassos. Progression and Verification of Situation Calculus Agents with Bounded Beliefs. Studia Logica, 1-15, September 2015.
- 40. Giuseppe De Giacomo, Alfonso Gerivini, Fabio Patrizi, Alessandro Saitti, Sebastian Sardina. Agent Planning Programs. Artificial Intelligence, 231: 64-106. Elsevier, 2016.
- 41. Giuseppe De Giacomo, Yves Lesperance, Fabio Patrizi. Bounded Situation Calculus Action Theories. Artificial Intelligence, 237:172-203. Elsevier, 2016.

# **Contributions to conferences (refereed)**

- 1. Giuseppe De Giacomo, Maurizio Lenzerini. Boosting the correspondence between description logics and propositional dynamic logics. In Proceedings of the 12th National Conference on Artificial Intelligence (AAAI'94), pages 205–212. AAAI-Press/The MIT-Press, 1994.
- 2. Giuseppe De Giacomo, Maurizio Lenzerini. Concept language with number restrictions and fixpoints, and its relationship with mu-calculus. In Proceedings of the 11th European Conference on Artificial Intelligence (ECAI'94), pages 411–415. John Wiley and Sons, 1994.
- 3. Giuseppe De Giacomo, Maurizio Lenzerini. Description logics with inverse roles, functional restrictions, and n-ary relations. In Proceedings of the 4th European Workshop on Logics in Artificial Intelligence (JELIA'94), Lecture Notes in Artificial Intelligence 838, pages 332–346, Springer- Verlag, 1994.
- 4. Giuseppe De Giacomo, Maurizio Lenzerini. What's in an aggregate: foundations for description logics with tuples and sets. In Proceedings of the 14th International Joint Conference on Artificial Intelligence (IJCAI'95), pages 801–807. Morgan Kaufmann Publishers, 1995.
- 5. Giuseppe De Giacomo, Maurizio Lenzerini. PDL-based framework for reasoning about actions. In Proceedings of the 4th Conference of the Italian Association for Artificial Intelligence (AI\*IA'95), Lecture Notes in Artificial Intelligence 992, pages 103–114, Springer-Verlag, 1995.
- 6. Diego Calvanese, Giuseppe De Giacomo, Maurizio Lenzerini. Structured objects: modeling and reasoning. In Proceedings of the 4th International Conference on Deductive and Object-Oriented Databases (DOOD'95), Lecture Notes in Computer Science 1013, pages 229–246, Springer-Verlag, 1995.
- 7. Giuseppe De Giacomo, Paolo Naggar. Conceptual data model with structured objects for statistical databases. In Proceedings of the 8th International Conference on Statistical Database Management Systems (SSDBM'96), pages 168–175. IEEE Computer Society Press, 1996.

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