europass Curriculum vitae

PERSONAL INFORMATION

Marco Console

Via Ariosto, 25. 00185. Roma, Italy.

console@diag.uniroma1.it

Gender Male | Date of birth 25 April 1985 | Nationality Italian

EDUCATION AND TRAINING

2012–2016 **PhD in Engineering in Computer Science** EQF 8

Sapienza, University of Rome.

2010–2012 **Laurea Magistrale in Ingegneria Informatica** EQF 7

Sapienza, University of Rome. Rome, Italy.

2004–2009 **Laurea in Ingegneria Informatica** EQF 6

Sapienza, University of Rome. Rome, Italy.

WORK EXPERIENCE

2020 - present **Non-Tenured Assistant Professor (RTD-A).**

Sapienza, University of Rome..

2016 - 2020 **Research Associate.**

School of Informatics, University of Edinburgh.

2015 - 2016 **Assegnista di Ricerca.**

Sapienza, University of Rome.

LANGUAGES

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2

RESEARCH ACTIVITIES

Research Theme

Ontology-Based Data Quality

During the course of my PHD, I worked extensively on algorithms and techniques to assess the quality of data. My work on this topic is in collaboration with Prof. Maurizio Lenzerini. The techniques we developed rely on the well-known paradigm of ontologies to asses the quality of data at the conceptual level. Intuitively, an ontology is the conceptualization of a domain of interest, written in terms of some logical formalism. This novel paradigm, that we dubbed Ontology-Based Data Quality, gave rise to several interesting research questions, connected to both ontological reasoning and data management. The work containing the initial definition of the framework and several preliminary results was accepted for publication in two major AI conferences, i.e., AAAI and ECAI (2014). Further developments on the topic have been accepted for publication in AAAI 2020.

Research Theme

Databases with Incomplete Information

During my post-doctoral years at the School of Informatics of the University of Edinburgh, I worked on several topics connected to incomplete databases. My work on this topic, mainly in collaboration with Prof. Leonid Libkin and Prof. Paolo Guagliardo, spans several different problems.

Bag-Semantics

We studied the complexity of the *bag semantics* data model in the presence of incomplete information. Intuitively, the bag semantics data model allows multiple occurrences of tuples in database relations, capturing a fundamental feature of real-world databases. In this context, we studied the complexity of computing a very natural form of answer, i.e., *certain answers*, in several different fragments of *relational algebra*. This work was accepted for publication in ICDT 2019.

SQL

In real-world databases, the standard way to express queries is via SQL, i.e., the ISO committee standard for database queries. While the expressive power of SQL is clear in the case of complete databases, the picture becomes much more complex in the case of incomplete information. In our work, we tried to shed some light on the problem, studying the logic underlying incomplete SQL databases. This work was accepted for publication in KR 2018 and won the Best Paper Award.

Numerical Queries

An important feature of real-world databases is the ability to evaluate arithmetic expressions over the data. Unfortunately, arithmetic expressions are very hard to handle in the case of incomplete databases, and, in this case, several natural problems become intractable. To mitigate this issue, we defined a novel form of answers for queries with arithmetic expressions. While computing these answers is still intractable, this novel definition allows for efficient approximation schemes. Preliminary results on this topic have been accepted for publication in IJCAI 2019. A work discussing several algorithmic techniques related to this problem has been accepted for pubblication in the forthcoming ACM PODS 2020 conference.

Research Theme

Consistent Query Answering

Together with my work on incomplete information, during my post-doctoral years I had the opportunity to work on the topic of Consistent Query Answering. I worked on this topic in collaboration with Andreas Pieris and Marco Calautti. Consistent Query Answering is the problem of computing meaningful answers to queries over inconsistent datasets, i.e., datasets that violate a given set of integrity constraints. In the literature, a widely accepted form of answer is constituted by the number of *repairs* that satisfy a given query. Intuitively, a repair for an inconsistent database D is a consistent database D' that minimally differs from D. In our work, we studied the *data complexity* of counting the number of satisfying repairs for a given query q, under sets of primary key constraints. In this context, we proved intractability even for very restricted cases, and presented interesting approaches to approximation. Our work on this topic was accepted for publication in ACM PODS 2019.

ACCADEMIC ACTIVITIES

Bibliometrics

Dissemination

I authored more than 20 papers, accepted for publication in high-profile conference in my reference areas. Among the others, my work has been accepted for publication in some of the most prestigious international conferences of Data Management, e.g., ACM PODS, and AI, e.g., IJCAI, AAAI, and KR.

Awards

Ray Raiter Best Paper Award.

Principles of Knowledge Representation and Reasoning (KR). 2018.

KR is the reference conference in the area of AI for knowledge representation.

PC Member.

Program Committee Memeber of Scientific Conferences.

ACM Principles Of Database Systems (PODS). 2022.

International Joint Conference on Artificial Intelligence (IJCAI). 2020.

International Conference on Scientific and Statistical Database Management (SSDBM). 2020.

Principles of Knowledge Representation and Reasoning (KR). 2020.

Reviewer. **Reviewer for Scientific Journal.**

Information Systems Journal (2019);

International Journal of Information Management (2019).

Conference Chair **Chair of Scientific Conference**

Virtual Conference Arrangement Chair for the Principles of Knowledge Representation and Reasoning (KR) conference. 2021.

LIST OF PUBLICATIONS

2021

PODS Marco Console, Andreas Pieris, Phokion Kolaitis. Model-theoretic Characterizations of Rule-based Ontologies. ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2021. To Appear.

PODS Marco Calautti, Marco Console, Andreas Pieris. Benchmarking Approximate Consistent Query Answering. ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2021. To Appear.

2020

Information Systems Marco Console, Paolo Guagliardo, Leonid Libkin. Fragments of bag relational algebra: Expressiveness and certain answers. Information Systems, 2020. ISSN: 0306-4379. DOI: https://doi.org/10.1016/j.is.2020.101604

KR Marco Console, Matthias Hoefer, Leonid Libkin. Reasoning about Measures of Unmeasurable Sets. Proceedings of the Seventeenth International Conference on Principles of Knowledge Representation and Reasoning, KR, 2020.

PODS Marco Console, Paolo Guagliardo, Leonid Libkin, Etienne Toussaint. Coping with Incomplete Data: Recent Advances. ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2020.

PODS Marco Console, Matthias Hoefer, Leonid Libkin. Queries with Arithmetic over Incomplete databases. ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2020.

AAAI Marco Console and Maurizio Lenzerini. Epistemic Integrity Constraints for Ontology-Based Data Management. Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI, 2020.

2019

PODS Marco Calautti, Marco Console, and Andreas Pieris. Counting database repairs under primary keys revisited. Proceedings of the 38th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, PODS 2019.

IJCAI Marco Console, Paolo Guagliardo, and Leonid Libkin. Do we need many-valued logics for incomplete information? Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI, 2019.

IJCAI Marco Console, Matthias Hofer, and Leonid Libkin. Measuring the likelihood of numerical constraints. Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI, 2019.

ICDT Marco Console, Paolo Guagliardo, and Leonid Libkin. Fragments of bag relational algebra: Expressiveness and certain answers. Proceedings of the 22nd International Conference on Database Theory, ICDT, 2019.

2018

KR Marco Console, Paolo Guagliardo, and Leonid Libkin. Propositional and predicate logics of incomplete information. Proceedings of the Sixteenth International Conference on Principles of Knowledge Representation and Reasoning, KR, 2018.

2017

IJCAI Marco Console, Paolo Guagliardo, and Leonid Libkin. On querying incomplete information in databases under bag semantics. Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence, IJCAI, 2017.

BigData Tiziana Catarci, Monica Scannapieco, Marco Console, and Camil Demetrescu. My (fair) big data. Proceedings of the IEEE International Conference on Big Data, BigData 2017.

2016

KR Marco Console, Paolo Guagliardo, and Leonid Libkin. Approximations and refinements of certain answers via many-valued logics. Proceedings of the Fifteenth International Conference on Principles of Knowledge Representation and Reasoning, KR, 2016.

2014

AAAI Marco Console and Maurizio Lenzerini. Data quality in ontology-based data access: The case of consistency. Proceedings of the Twenty-Eighth AAAI Conference on Artificial Intelligence, AAAI, 2014.

ECAI Marco Console and Maurizio Lenzerini. Reducing global consistency to local consistency in ontology-based data access. Proceedings of the 21st European Conference on Artificial Intelligence, ECAI, 2014.

ISWC Marco Console, José Mora, Riccardo Rosati, Valerio Santarelli, and Domenico Fabio Savo. Effective computation of maximal sound approximations of description logic ontologies. Proceedings of the 13th International Semantic Web Conference, ISWC, 2014.

ISWC Marco Console, Domenico Lembo, Valerio Santarelli, and Domenico Fabio Savo. Graphical representation of OWL 2 ontologies through graphol. Proceedings of the ISWC 2014 Posters & Demonstrations Track, ISWC 2014.

2013

VLDB Cristina Civili, Marco Console, Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini, Lorenzo Lepore, Riccardo Mancini, Antonella Poggi, Riccardo Rosati, Marco Ruzzi, Valerio Santarelli, and Domenico Fabio Savo. MASTRO STUDIO: managing ontology-based data access applications. PVLDB, 2013.

RR Marco Console, Valerio Santarelli, and Domenico Fabio Savo. From OWL to DL - lite through efficient ontology approximation. Web Reasoning and Rule Systems - 7th International Conference, RR 2013.

ISWC Evgeny Kharlamov, Martin Giese, Ernesto Jiménez-Ruiz, Martin G. Skjæveland, Ahmet Soylu, Dmitriy Zheleznyakov, Timea Bagosi, Marco Console, Peter Haase, Ian Horrocks, Sarunas Marciuska, Christoph Pinkel, Mariano Rodriguez-Muro, Marco Ruzzi, Valerio Santarelli, Domenico Fabio Savo, Kunal Sengupta, Michael Schmidt, Evgenij Thorstensen, Johannes Trame, and Arild Waaler. Optique 1.0: Semantic access to big data: The case of norwegian petroleum directorate's factpages. ISWC 2013 Posters & Demonstrations Track.