Elisa Quintarelli

Date of birth	10/08/1974
Citizenship	Italian
Office	Università di Verona - Dipartimento di Informatica
	Str. le Grazie, 15 - 37134 Verona
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Highlights

- Articles (10 years): 18   Citations (15 years): 1035   H-index (15 years): 15

- **Council of PhD School:** Member of the Council of the PhD School in Computer Science (Università di Verona) from A.Y. 2018/2019.

- **Fundings:** She is Co-PI in the following projects: *ObiGame: may the force be with you*, 5 PER MILLE POLISOCIAL AWARD, FUNDED BY POLITECNICO DI MILANO AND FONDAZIONE POLITECNICO, Oct. 2013/Oct. 2015, EU 76.000; Grant CG #574830 from Cisco University Research Program Fund of Silicon Valley Community Foundation for "Exploiting (historical) test output data to improve functional diagnosis" - Jan. 2013/Dec.2013, US$100.000. She was PI of the project *Efficient querying of semistructured and temporal data*, YOUNG RESEARCHER FUNDING PROGRAM FROM POLITECNICO DI MILANO/MURST, 2002, Lit. 10.000.000 and co-PI of the project *Retrieval and Integration of multimedia data*, YOUNG RESEARCHER FUNDING PROGRAM FROM UNIVERSITÀ DI VERONA/MURST, 1999. She also contributes/contributed actively in other research projects.

- **Contracts:** She obtained the contract *Big Data Analytics in FROMM Packaging Automation*, with CIM&Form, Fondirigenti, EU 10.000 (2019).

- **Invited Talks:** Member of the panel "How Far Should We Personalize?" at 3rd Int. Workshop on Personalized Access, Profile Management, and Context Awareness in Databases (co-located with VLDB 2009).

- **Grants:** IBM Faculty Award for the research SOFIA: Semi-autOmatic Financial Information Analytics (2015). Chorafas Award for the best Ph.D Thesis, Politecnico di Milano (January 2002).

- **Editor for Journals:** Editor of the Special Issue "Novel Database Systems and Data Mining Algorithms in the Big Data Era" of Electronics (ISSN 2079-9292) by MDPI. In the Review Board of PVLDB 7 (Proceedings of the VLDB Endowment, Volume 7).

- **PhD Students' Supervision:** Advisor of 1 PhD student (Emanuele Rabosio) and co-advisor of 1 Ph.D student (Mirjana Mazuran), both currently Post-Doc collaborators.

- **Courses:** She taught four editions of the module "Conceptual and logical design" - International Master in Business and Analytics and Big Data (Politecnico di Milano Graduate School of Business). She taught two editions of a course on Context-Awareness for Ph.D students (in collaboration with three professors) at Politecnico di Milano and a course on Big Data for PhD students (in collaboration with Prof. D. Carra) at Università di Verona.

- Her Ph.D Thesis has been published by Springer-Verlag as a single-author book: Model-checking Based Data Retrieval. An Application to Semistructured and Temporal Data, Volume 2917 of LNCS, 2004.

- Author of more than 70 peer-reviewed publications that include 25 international journals. Noticeably, three papers in the Information Systems journal (Elsevier) and one in the IEEE TKDE, a demo paper accepted at ICDE 2014. 20% of the publications include co-authors with different affiliations. According to Google Scholar she has more than 1500 citations and a h-index of 19 (December 2019).

Position and Education

October 2018 – now

Associate Professor at University of Verona, Scientific Area: "Computer Science".

January 2015 – September 2018

Associate Professor at Politecnico di Milano, Scientific Area: "Computer Engineering".

January 2005 – January 2015

Assistant Professor at Politecnico di Milano, Scientific Area: "Computer Engineering".

May 2002 – December 2004

Temporary research assistant at the Department of Electronics and Computer Science of the Politecnico di Milano working on "New Technologies to support e-commerce".

September 1998 – August 1999

Temporary research at ITC-IRST (Fondazione Bruno Kessler) in Trento, in the Human Language Technology group.

EDUCATION

- Ph.D. in Information Technology at Politecnico di Milano. January 2002.
  Title: *Model-checking based data retrieval: an application to semistructured and temporal data*
  Advisor: *L. Tanca*. Reviewer: *C. Zaniolo*.

- Laurea in Informatica at the University of Verona. July 1998. Grade: 110/110 Cum Laude.
  Thesis title: *WG-Log: semantiche operazionali e proprietà logiche*
  Advisors: *L. Tanca, A. Dovier*.

VISITING EXPERIENCES

- Visiting scholar at LIX (Laboratoire d'Informatique), Ecole Polytechnique (June 2000 - July 2000).

Awards

AW.1. IBM Faculty Award for the research SOFIA: Semi-autOmatic Financial Information Analytics, 2015.

AW.2. Chorafas Award for the best Ph.D Thesis in Computer Science and Automation Engineering at Politecnico di Milano. January 2002.

Academic Services

2018-now

Component of the Council of the PhD School in Computer Science A.Y. 2018/2019 - Department Computer Science (Univ. of Verona).

Component of the AQ Commission for the Bachelor Degree in Computer Science - L31 (Univ. of Verona).

2019

Member of the PhD Admission Committee at University of Verona.

2010-now

Webmaster for the Web Site of the degree and master courses in Computer Science and Engineering of Politecnico di Milano.

2017

Member of the PhD Admission Committee at DEIB (PoliMI).

Teaching activity

2022-2023

Programmazione I (*Teacher*) - Computer Science - Undergraduate level.

Data warehouses and integration (*Teacher*) - Computer Science - Master level.

Databases (*Teacher*) - Datascience - Master level.

2021-2022

Programmazione I (*Teacher*) - Computer Science - Undergraduate level.

Data warehouses and integration (*Teacher*) - Computer Science - Master level.

Databases (*Teacher*) - Datascience - Master level.

2020-2021

Programmazione I (*Teacher*) - Computer Science - Undergraduate level.

Data warehouses and integration (*Teacher*) - Computer Science - Master level.

Databases (*Teacher*) - Datascience - Master level.

2019-2020

Programmazione I (*Teacher*) - Computer Science - Undergraduate level.

Big Data, **Course for Ph.D. students** in Computer Science at University in Verona, with S. Migliorini.

2018-2019

Programmazione I (*Teacher*) - Computer Science - Undergraduate level.

Big Data, **Course for Ph.D. students** in Computer Science at University in Verona, with prof. D. Carra.

Conceptual and logical design - International Master in Business and Analytics and Big Data (Politecnico di Milano Graduate School of Business).

2017-2018

Informatica (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.28/4 (faculty average 3.08/4)**).

Database I (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.38/4 (faculty average 3.10/4)**).

Conceptual and logical design - International Master in Business and Analytics and Big Data (Politecnico di Milano Graduate School of Business).

2016-2017

Informatica (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.20/4 (faculty average 3.04/4)**).

Database I (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.40/4 (faculty average 3.10/4)**).

Conceptual and logical design - International Master in Business and Analytics and Big Data (Politecnico di Milano Graduate School of Business).

2015-2016

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.15/4 (faculty average 3.10/4)**).

Database I (*Teacher*) - Computer Engineering - Undergraduate level (**Global teaching evaluation: 3.45/4 (faculty average 3.10/4)**).

Conceptual and logical design - International Master in Business and Analytics and Big Data (Politecnico di Milano Graduate School of Business).

2014-2015

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

2013-2014

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Computer Science Fundamentals (*Lab Supervisor*) - Computer Engineering - Undergraduate level.

2012-2013

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Computer Science Fundamentals (*Lab Supervisor*) - Computer Engineering - Undergraduate level.

2011-2012

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Informatica B (*Teacher*) - Computer Engineering - Undergraduate level.

2010-2011

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

2009-2010

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Project of Database Systems (*Teacher*) - Computer Engineering - Undergraduate level.

2008-2009

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

Mobile, Context-Aware Databases and Database Systems, **Course for Ph.D. students** in Computer Science and Automation Engineering at Politecnico di Milano, with proff. Cristiana Bolchini, Letizia Tanca, Fabio A. Schreiber.

2007-2008

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2006-2007

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

Mobile, Context-Aware Databases and Database Systems, **Course for Ph.D. students** in Computer Science and Automation Engineering at Politecnico di Milano, with proff. Cristiana Bolchini, Letizia Tanca, Fabio A. Schreiber.

2005-2006

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2004-2005

Informatica A (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2003-2004

Informatica C (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2002-2003

Informatica C (*Teacher*) - Computer Engineering - Undergraduate level.

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

Informatica B (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2001-2002

Database (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

Informatica B (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

2000-2001

Computer Science Fundamentals (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

1999-2000

Computer Science Fundamentals (*Teacher Assistant*) - Computer Engineering - Undergraduate level.

STUDENTS' SUPERVISION

PhD Students Supervision

- *Emanuele Rabosio* 2009-2012, "Context-Aware Data Personalization: Issues and Solutions" (Advisor).

- *Mirjana Mazuran* 2008-2011, "Advanced techniques for flexible database queries" (Co-Advisor, Advisor: Letizia Tanca).

- *Antonio Miele* (Supervision of the Minor Research Project) 2006-2007, "A Methodology for the compression of context dependent data views".

- *Simone Gasparini* (Supervision of the Minor Research Project) 2004-2005, "Intensional Query Answering to XQuery Expressions".

Graduate Students Supervision/Co-Advisor

- From 2002 Elisa Quintarelli has supervised students for their graduation thesis projects, either as an advisor or co-advisor, on research related to databases, query languages, data mining and context-aware data design and personalization.

Professional Activities

NATIONAL, INTERNATIONAL RESEARCH PROJECTS AND OTHER GRANTS

Elisa Quintarelli has been funded for the following research projects:

- Contract *Big Data Analytics in FROMM Packaging Automation*, with CIM&Form, Fondirigenti, EU 10.000 (2019).

- Principal Investigator on *SOFIA: Semi-autOmatic Financial Information Analytics*, IBM FACULTY AWARD, FUNDED BY IBM, Apr. 2015, 12.000 USD.

- Co-Principal Investigator on *ObiGame: may the force be with you*, 5 PER MILLE POLISOCIAL AWARD, FUNDED BY POLITECNICO DI MILANO AND FONDAZIONE POLITECNICO, Oct. 2013/Oct. 2015, EU 76.000 (PI: Cristina Masella).

- Co-Principal Investigator on Grant CG #574830 from Cisco University Research Program Fund of Silicon Valley Community Foundation for "Exploiting (historical) test output data to improve functional diagnosis" - Jan. 2013/Dec.2013, US$ 100.000 (PI: Cristiana Bolchini).

- Principal Investigator on *Efficient querying of semistructured and temporal data*, YOUNG RESEARCHER FUNDING PROGRAM FROM POLITECNICO DI MILANO/MURST, 2002, Lit. 10.000.000.

- Co-Principal Investigator on *Retrieval and Integration of multimedia data*, YOUNG RESEARCHER FUNDING PROGRAM FROM UNIVERSITÀ DI VERONA/MURST, 1999.

She also contributes/contributed actively in the following research projects:

- *Computer Engineering for Industry 4.0*: PROGETTO D'ECCELLENZA UNIVERSITÀ DI VERONA) (Principal investigator: F. Fummi).

- *GOF4R: Governance of the Interoperability Framework for Rail and Intermodal Mobility*: EUROPEAN HORIZON 2020 PROGRAM, GRANT AGREEMENT NO: 730844 (2016-2018) (local principal investigator: M. Rossi).

- *IT2Rail: Information Technologies for Shift2Rail*: EUROPEAN HORIZON 2020 PROGRAM, GRANT AGREEMENT NO: 636078 (2015-2017) (local principal investigator: M. Rossi).

- *SmartH2O: an ICT Platform to leverage on Social Computing for the efficient management of Water Consumption*, FP7 619172 (2014-2017) (local principal investigator: prof. P. Fraternali).

- *EEB: Edifici a Zero Consumo Energetico in Distretti Urbani Intelligenti*, funding program CLUSTER TECNOLOGICO NAZIONALE TECNOLOGIE PER LE SMART COMMUNITIES, MIUR (2014-2017).

- *SCUOLA: Smart Campus as Urban Open Labs*, funding program REGIONE LOMBARDIA ÒSMART CITIES AND COMMUNITIES, REGIONE LOMBARDIA (2014-2016).

- *SMS-COM: Self-Managing Situated Computing*, FP7 ERC-2008 (local principal investigator: prof. C. Ghezzi).

- *Strategic pan-European ballistics intelligence platform for combating organised crime and terrorism: Odyssey*, FP7-SEC-2007-1 - 218237 (with DIG, Politecnico di Milano).

- *ART-DECO - Adaptive InfRasTructures for DECentralized Organizations*, MIUR FIRB (2006-2009) (local principal investigator: prof. C. Ghezzi).

- *ESTEEM- Emergent Semantics and cooperaTion in multi-knowledge EnvironMents - Advanced methods and tools for semantic cooperation in Web virtual communities*, PRIN 2005, ITALIAN MIUR (local principal investigator: prof. L. Tanca).

- *MAIS - Multichannel adaptive information systems*, MIUR FIRB (2002-2006) (local principal investigator: prof. L. Tanca).

Program Committee Membership

Elisa Quintarelli was a member of the Program Committee of the following conferences:

- *2nd International Workshop on Processing Information Ethically)* (PIE 2020)

- *1st International Workshop on Processing Information Ethically)* (PIE 2019)

- *Data Analytics solutions for Real-LIfe APplications* (DARLI-AP 2020)

- *21st International Conference on Extending Database Technology, Demo Session* (EDBT 2018)

- *2nd Workshop on Engineering Context-Aware Applications and Services* (ECAAS 2018)

- *8th Italian Information Retrieval Workshop* (IIR 2017)

- *1st International Workshop on Data Analytics solutions for Real-LIfe Applications* (DARLI-AP 2017)

- *ACM SIGMOD Conference* (Sigmod 2017)

- *24th Italian Symposium on Advanced Database Systems* (SEBD 2016)

- *2nd International Workshop on Big Data Applications and Principles* (BigDap 2015)

- *Convegno Italiano di Logica Computazionale 2015*

- *22nd Italian Symposium on Advanced Database Systems* (SEBD 2014)

- *17th East-European Conference on Advances in Databases and Information Systems* (ADBIS 2013).

- *11th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing* (EUC 2013)

- *Sixth International Workshop on Flexible Database and Information System Technology* (FlexDBIST 2011)

- *XIX Convegno Nazionale su Sistemi Evoluti per Basi di Dati* (SEBD 2011).

- *XVII Convegno Nazionale su Sistemi Evoluti per Basi di Dati* (SEBD 2009).

- *Third International Workshop on Database Technologies for Handling XML Information on the Web* (DataX 2008)

- *ESTEEM'08 - First International Workshop on Emergent Semantics and cooperaTion in opEn systEMs*

- *Second International Workshop on Database Technologies for Handling XML Information on the Web* (DataX 2006)

- *XII Convegno Nazionale su Sistemi Evoluti per Basi di Dati* (SEBD 2004)

Referee services

Elisa Quintarelli has been a reviewer for the following conferences/journals:

- **PVLDB Volume 7** (Proceedings of the VLDB Endowment, Volume 7).

- Elsevier Information Systems

- Data & Knowledge Engineering (DKE)

- ACM Transaction on Database Systems (TODS)

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining

- International Conference on Data Engineering

- International Conference on Data Mining

- International Workshop on Exploratory Search in Databases and the Web

- International Conference on Enabling Technologies: Infrastructure for Collaborative Entreprises

- British National Conference on Databases (BNCOD)

- International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR)

Talks and Seminars

PANELS

- Member of the panel "How Far Should We Personalize?" at the 3rd International Workshop on Personalized Access, Profile Management, and Context Awareness in Databases. August 28, 2009 - Lyon, France.

GUEST SEMINARS

- "Taming information overload", at Università degli Studi di Verona, March 27, 2018.

- "Managing information overload", at Politecnico di Milano, February 6, 2014.

- "Data Mining to Support Intensional Answering of Big Data", at Università degli Studi di Trento, February 19, 2013.

- "Model checking based data retrieval", at Università Ca' Foscari Venezia, February 7, 2001.

- "Context-Aware Access to Heterogeneous Resources Through On-the-Fly Mashups", at *CAISE*, 2018.

- "Mining Context-Aware Preferences on Relational and Sensor Data", at *Flexible Database and Information System Technology*, 2011.

- "Mining Violations to Relax Relational Database Constraints", at *Data Warehousing and Knowledge Discovery, 11th International Conference*, 2009.

- "Mining Tree-Based Frequent Patterns from XML", at *Eight International Conference on Flexible Query Answering Systems*, 2009.

- "Mining Flexible Association Rules from XML", at *4th International Workshop on Database Technologies for Handling XML Information on the Web*, 2009.

- "Using context for the extraction of relational views", at *Sixth International and Interdisciplinary Conference on Modeling and Using Context*, 2007.

- "Anomaly Detection in XML databases by means of Association Rules", at *Second International Workshop on Flexible Database and Information System Technology*, 2007.

- "Graph transformation to infer schemata from XML documents", at *ACM Symposium on Applied Computing*, 2005.

- "Specifying temporal data models for semistructured data by a constraint-based approach", at *ACM Symposium on Applied Computing*, 2004.

- "Answering Queries on XML Data by means of Association Rules", at *International Workshop on Database Technologies for Handling XML information and the Web - EDBT Conference*, 2004.

- "Model-Checking Based Data Retrieval", at *8th Biennial Workshop on Data Bases and Programming Languages*, 2001.

- "Incompleteness, Counterexamples and Refinements in Abstract Mode-Checking", at *The 8th International Static Analysis Symposium*, 2001.

- "Modeling users' navigation history", at *Workshop on Intelligent Techniques for Web Personalisation - IJCAI Conference*, 2001.

- "Refining and Compressing Abstract Model Checking", at *APPIA-GULP-PRODE*, 2000.

- "Systematic design of abstract model checking", at *15th Annual IEEE Symposium on Logic in Computer Science*, 2000.

Research interests

In the field of Big Data and Analytics my recent research has been devoted to reducing the data overload and making sense of data. In more detail, I have recently started to investigate the richness of challenges posed by database exploration, a paradigm that takes different shapes but aims at supporting end users to take decisions, investigate and seek inspiration, compare data, verify a research hypothesis, or just browse documents and learn something new. In the scope of knowledge access, in order to reduce the information overload the current user context has often been adopted as a criterion for personalization by knowledge filtering: the adaptation

in this case consists of providing the user only with the portion of knowledge that is relevant for the situation that s/he is experiencing, thus favoring easier access to what the user really needs. In the past years, I have extensively investigated the possibility of adopting the current user context as a criterion for personalization by knowledge filtering and have proposed a context-awareness design methodology based on a hierarchical context model. Moreover, I have applied data mining techniques to different fields and expecially to extract relevant features from past accesses of data in order to focus on the items of interest (e.g. provide the users with personalized views on the data), or recommend additional options or suggestions for future accesses, thus making sense of large amounts of data. The investigated issues (and related main publications) are:

DATABASE EXPLORATION

In our viewpoint database exploration aims at designing systems able to assist inexperienced or casual users - the so-called data enthusiasts - who need the support of a sophisticated system that guides them in the inspection of large datasets, starting from simple input queries. We may thus describe our exploration as the step-by-step conversation of a user with the system, where each step can refine the previous ones incrementally, gathering new knowledge that fulfills the user needs, sometimes even unveiling new ones. These systems may also suggest, along the way, other data and exploration paths that may be relevant for them, where the notion of relevance can be defined by statistical measures or, in a crowdsourcing environment, be based on the subjective perception of users [JR.11].

CONTEXT-AWARE DATA DESIGN, INTEGRATION, CUSTOMIZATION AND TAILORING

In Information Management, context-aware systems are mainly devoted to determining which information is relevant with respect to the ambient conditions. Indeed, nowadays the amount of available data and data sources requires not only to integrate them, but also to filter (tailor) their information in order to: 1) provide the user with the appropriately tailored set of data, 2) match devices' physical constraints, 3) operate on a manageable amount of data (for improving query processing efficiency), and 4) provide the user with time- and location-relevant data (mobile applications). Given this scenario, this research is dealt with in the Context-ADDICT project, and has produced:

- a definition of the notion of context in the database field [JR.15], [JR.22];

- a survey and comparison of the most interesting approaches to context modelling and usage available in the literature [JR.25];

- a design methodology providing a systematic support to the designer of data management applications – be them related to a huge (e.g., in data warehousing) or to a very small amount of data (e.g., in portable, lightweight data management systems) – in determining context-aware database portions to be delivered to each user in each specific context [JR.15],[JR.19], [JR.22].

More research topics are: context-awareness in social media; automatic learning of unknown contexts; representation of context evolution [IC.16], contextual modeling of self-adaptive Computing Systems [IC.12].

CONTEXT-AWARE PREFERENCES

With data tailoring, given a target scenario, in each specific context the system allows users or applications to access only the data view that is relevant in that context. However, this does not always yield the solution since user preferences may still vary according to the context the user is currently in, and a change in context may change the relative importance a user attributes to information. In this case, contextual preferences can be used to further refine the views associated with contexts, by imposing a ranking on the data of a context-aware view. On the other hand, we cannot actually expect a user to manually specify the long list of preferences that might

be applied to all available data when a context becomes active; this is why in this paper we propose a methodology and a system, PREMINE , where data mining is used to infer contextual preferences from the previous user's querying activity: in particular, our approach mines contextual preferences from the past interaction of the user with contextual views over a relational database, gathering knowledge in terms of association rules between each context and the data which is relevant for the user in that context [JR.14],[IC.14],[IC.18]. An application for mobile devices contextual that infers contextual preferences about the movie domain has been developed and presented in [IC.11]. We have also investigate how to recommend additional options or suggestions for future accesses, both to single users or group of them, on the base of the contextual past activities [IC.6].

DATA MINING FOR XML QUERY-ANSWERING SUPPORT.

The database research field has concentrated on the Extensible Markup Language (XML) as a flexible hierarchical model suitable to represent huge amounts of data with no absolute and fixed schema, and a possibly irregular and incomplete structure. An important line in this research is the need of getting the gist of an XML document both in terms of content and structure. Discovering recurrent patterns inside XML documents provides high-quality knowledge about the document content: frequent patterns are in fact intensional information about the data contained in the document itself, that is, they specify the document in terms of a set of properties rather than by means of data. As opposed to the detailed and precise information conveyed by the data, this information is partial and often approximate, but synthetic, and concerns both the document structure and its content.

The results of this line of work, published in [JR.17], [JR.26] consist in providing a method for deriving intensional knowledge from XML documents in the form of TARs, and then storing these TARs as an alternative, synthetic data set to be queried for providing quick and summarized answers.

DATA MINING ALGORITHMS AND OUTLIER DETECTION

We have proposed a method, based on data mining algorithms, which allows one to infer the "normal behavior" of objects, by extracting frequent "rules" from a given dataset. These rules are described in the form of quasi-functional dependencies and mined from the dataset by using association rules. Our approach allows us to consequently analyze anomalies with respect to the previously inferred dependencies: we can either derive the presence of erroneous data or highlight novel information which represents significant exceptions of frequent rules. Our method is independent of the considered database and directly infers rules from the data [JR.27].

Recently, data mining algorithms have been applied for Incremental Adaptive Functional Diagnosis in [IC.13].

Complete publication list

PUBLICATION LIST

REFEREED INTERNATIONAL JOURNALS

JR.1.   S. Migliorini, E. QUINTARELLI, Mauro Gambini, Alberto Belussi, Damiano Carra: Sequence recommendations for groups: A dynamic approach to balance preferences. *Information Systems* 108: 102023 (2022)
[doi: https://doi.org/10.1016/j.is.2022.102023]

JR.2.   S. Migliorini, E. QUINTARELLI, A. Belussi: Tracking Data Provenance of Archaeological Temporal Information in Presence of Uncertainty. *ACM Journal on Computing and Cultural Heritage* 31:1-31:32 (2022)
[doi: https://doi.org/10.1145/3480956]

JR.3.   S. Migliorini, A. Belussi, E. QUINTARELLI, D. Carra: CoPart: a context-based partitioning technique for big data.
Journal of Big Data 8(1): 1-28 (2021)
[doi: 10.1186/s40537-021-00410-4]

JR.4.   A. Giuzio, G. Mecca, E. QUINTARELLI, M. Roveri, D. Santoro, L.Tanca
INDIANA: An interactive system for assisting database exploration.
Information Systems 83: 40-56 (2019)
[doi: https://doi.org/10.1016/j.is.2019.01.003]

JR.5.   E. QUINTARELLI, E. Rabosio, L. Tanca: Efficiently using contextual influence to recommend new items to ephemeral groups.
Information Systems 84: 197-213 (2019)
[doi: https://doi.org/10.1007/s10115-018-1305-8]

JR.6.   E. Damiani, B. Oliboni, E. QUINTARELLIi, L. Tanca: A graph-based meta-model for heterogeneous data management.
Knowledge and Information Systems 61(1): 107-136 (2019)
[doi: https://doi.org/10.1016/j.is.2019.05.003]

JR.7.   N. Di Blas, M. Mazuran, P. Paolini, E. QUINTARELLI, L. Tanca
Exploratory computing: a comprehensive approach to data sensemaking.
I. J. Data Science and Analytics 3(1): 61-77 (2017).
[doi: http://dx.doi.org/10.1007/s41060-016-0039-5]

JR.8.   Cristiana Bolchini and Angela Geronazzo E. QUINTARELLI
Smart buildings: A monitoring and data analysis methodological framework.
Building and Environment 121: 93-105 (2017).
[doi: https://doi.org/10.1016/j.buildenv.2017.05.014]

JR.9.   D. Bianchini, P. Garza, E. QUINTARELLI
Characterization and search of web services through intensional knowledge.
J. Intell. Inf. Syst., 47(3): 375-401 (2016).
[doi: http://dx.doi.org/10.1007/s10844-015-0369-0]

JR.10. E. QUINTARELLI, E. Rabosio, L. Tanca
A principled approach to context schema evolution in a data management perspective.
Information Systems, Elsevier, Volume 49: 65-101 (2015).
[doi: http://dx.doi.org/10.1016/j.is.2014.11.008]

JR.11. M. Buoncristiano, G. Mecca, E. QUINTARELLI, M. Roveri, D. Santoro, L. Tanca
Database Challenges for Exploratory Computing.
SIGMOD Record, 44(2): 17-22 (2015).
[doi: http://dx.doi.org/10.1145/2814710.2814714]

JR.12.   C. Bolchini, L. Cassano, P. Garza, E. QUINTARELLI, Fabio Salice
An Expert CAD Flow for Incremental Functional Diagnosis of Complex Electronic Boards.
IEEE Trans. on CAD of Integrated Circuits and Systems 34(5): 835-848 (2015).
[doi: http://dx.doi.org/10.1109/TCAD.2015.2396997]

JR.13.   D. Bianchini, S. Castano, V. De Antonellis, A. Ferrara, E. QUINTARELLI, L. Tanca
RUBIK: Proactive, Entity-Centric and Personalized Situational Web Application Design.
T. Large-Scale Data- and Knowledge-Centered Systems, Springer, Volume 13: 123-157 (2014).
[doi: http://dx.doi.org/10.1007/978-3-642-54426-2]

JR.14.   A. Miele, E. QUINTARELLI, E. Rabosio, L. Tanca
A data-mining approach to preference-based data ranking founded on contextual information.
Information Systems, Elsevier, Volume 38(4): 524-544 (2013).
[doi: http://dx.doi.org/10.1016/j.is.2012.12.002]

JR.15.   C. Bolchini, E. QUINTARELLI, L. Tanca
CARVE: Context-aware automatic view definition over relational databases.
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