Elisa Quintarelli: curriculum vitæet studiorum

Name	Elisa Quintarelli
Institution	Università degli Studi di Verona - Computer Science Department
Email	`elisa.quintarelli@univr.it`
Web page	`http://www.di.univr.it/?ent=persona&id=6211`

Education and Position

Education

- Ph.D. in Information Technology, Politecnico di Milano. January 2002.
  Thesis Title: *Model-checking based data retrieval: an application to semistructured and temporal data*, Advisor: *L. Tanca*, Reviewer: *C. Zaniolo*.
- Laurea in Computer Science, University of Verona. July 1998. Grade: 110/110 Cum Laude.
  Thesis title: *WG-Log: semantiche operazionali e proprietà logiche*, Advisors: *L. Tanca, A. Dovier*.

Record of Employment

October 2024 – now

Full Professor at the Computer Science Department, University of Verona.

October 2018 – September 2024

Associate Professor at the Computer Science Department, University of Verona.

January 2015 – September 2018

Associate Professor at Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB), Politecnico di Milano.

January 2005 – January 2015

Assistant Professor at DEIB, Politecnico di Milano.

May 2002 – December 2004

Temporary research assistant at DEIB, 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.

Visiting experiences

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

Collaborations

The following are the main scientific collaborations:

- Kostas Stefanidis - Tampere University (Finland)
- Paolo Garza, Luca Cagliero, Elena Baralis - Politecnico di Torino (Italy)
- Letizia Tanca, Cristiana Bolchini - Politecnico di Milano (Italy)
- Giansalvatore Mecca - Università degli Studi della Basilicata (Italy)

Awards

AW.1. IBM Faculty Award for the research SOFIA: Semi-autOmatic Financial Information Analytics, 2015 (12,000.00 USD).

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

AW.3. 2024 Best Paper Award at the Information Technology & Tourism journal for the paper "Promoting sustainable tourism by recommending sequences of attractions with deep reinforcement learning", co-authored with Anna Dalla Vecchia, Sara Migliorini, Mauro Gambini, and Alberto Belussi.

Academic Services

1 October 2025-now
Rector's Adviser for Digital Innovation projects.

2023-now
Teaching Quality Assurance Adviser at the Computer Science Department (University of Verona).

2021-2025
Component of the AQ Commission for the Master's Degree in Data Science - LM-91 (Univ. of Verona).
Member of the working group for the Gender Equality Plan definition (Univ. of Verona).

2018-now
Component of the Council of the Ph.D. School in Computer Science at the Computer Science Department (University of Verona).

2018-2023
Component of the AQ Commission for the Bachelor's Degree in Computer Science - L-31 (University of Verona).

2019 and 2023
Member of the PhD Admission Committee at the Computer Science Department, University of Verona.

2010-now
Webmaster for the Web Site of the degree and master courses in Computer Science and Engineering, Politecnico di Milano.

2017
Member of the PhD Admission Committee at DEIB, Politecnico di Milano.

Teaching activity

For all the courses presented in the list, whenever not otherwise indicated, I have been both Lecturer and Examiner.

2025-2026

Programmazione I (4 credits) - Computer Science - Undergraduate level.

Programmazione I Lab (2 credits) - Computer Science - Undergraduate level.

Programmazione I (4 credits) - Bioinformatics - Undergraduate level.

Programmazione I Lab (2 credits) - Bioinformatics - Undergraduate level.

Programming and Databases (6 credits) - Data Science - Master level.

2024-2025

Programmazione I (8 credits) - Computer Science - Undergraduate level.

Programmazione I Lab (4 credits) - Computer Science - Undergraduate level.

Data warehouses and integration (6 credits) - Computer Engineering for Robotics and Smart Industry - Master level.

2023-2024

Programmazione I (8 credits) - Computer Science - Undergraduate level.

Programmazione I Lab (4 credits) - Computer Science - Undergraduate level.

Data warehouses and integration (6 credits) - Computer Engineering for Robotics and Smart Industry - Master level.

2022-2023

Programmazione I (8 credits) - Computer Science - Undergraduate level.

Programmazione I Lab (4 credits) - Computer Science - Undergraduate level.

Data warehouses and integration (6 credits) - Computer Engineering for Robotics and Smart Industry - Master level.

Databases (6 credits) - Data Science - Master level.

2021-2022

Programmazione I (8 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.59/4 (Department average 3.20/4)**).

Data warehouses and integration (4 credits) - Computer Engineering for Robotics and Smart Industry - Master level (**Global teaching evaluation: 3.47/4 (Department average 3.20/4)**).

Databases (6 credits) - Data Science - Master level (**Global teaching evaluation: 3.60/4 (Department average 3.20/4)**).

2020-2021

Programmazione I (8 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.66/4 (Deparment average 3.18/4)**).

Programmazione I Lab (2 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.64/4 (Department average 3.18/4)**).

Data warehouses and integration (6 credits) - Computer Engineering for Robotics and Smart Industry - Master level.

Databases (6 credits) - Data Science - Master level (**Global teaching evaluation: 3.60/4 (Department average 3.18/4)**).

2019-2020

Programmazione I (8 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.73/4 (Department average 3.14/4)**).

Programmazione I Lab (4 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.73/4 (Department average 3.14/4)**).

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

2018-2019

Programmazione I (8 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.55/4 (Department average 2.99/4)**).

Programmazione I Lab (4 credits) - Computer Science - Undergraduate level (**Global teaching evaluation: 3.55/4 (Department average 2.99/4)**).

Big Data, **Course for Ph.D. students** in Computer Science at University of 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 - Computer Engineering (PoliMI) - Undergraduate level (**Global teaching evaluation: 3.28/4 (Faculty average 3.08/4)**).

Database I - Computer Engineering (PoliMI) - 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 - Computer Engineering (PoliMI) - Undergraduate level (**Global teaching evaluation: 3.20/4 (Faculty average 3.04/4)**).

Database I - Computer Engineering (PoliMI) - 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 - Computer Engineering (PoliMI) - Undergraduate level (**Global teaching evaluation: 3.15/4 (Faculty average 3.10/4)**).

Database I - Computer Engineering (PoliMI) - 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 - Computer Engineering (PoliMI) - Undergraduate level.

2013-2014

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

2012-2013

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

2011-2012

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

Informatica B - Computer Engineering (PoliMI) - Undergraduate level.

2010-2011

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

2009-2010

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

2008-2009

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

Database - Computer Engineering (PoliMI) - Undergraduate level.

2006-2007

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

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

2004-2005

Informatica A - Computer Engineering (PoliMI) - Undergraduate level.

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

2003-2004

Informatica C - Computer Engineering (PoliMI) - Undergraduate level.

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

2002-2003

Informatica C - Computer Engineering (PoliMI) - Undergraduate level.

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

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

2001-2002

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

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

2000-2001

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

1999-2000

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

STUDENTS' SUPERVISION

Post-Doc Supervision

- 2020-2022: *Niccolò Marastoni* - Contextual Recommendations on Sensor Data.

PhD Students Supervision

- 2025 - now: *Indeewari Balasooriya* - PhD in Computer Science at Università di Verona.
- 2023 - now: *Anna Dalla Vecchia* - PhD in Computer Science at Università di Verona.
- 2009-2012: *Emanuele Rabosio* - "Context-Aware Data Personalization: Issues and Solutions" (Advisor).
- 2008-2011: *Mirjana Mazuran* - "Advanced techniques for flexible database queries" (Co-Advisor, Advisor: Letizia Tanca).
- 2006-2007: *Antonio Miele* (Supervision of the Minor Research Project) - "A Methodology for the compression of context dependent data views".
- 2004-2005: *Simone Gasparini* (Supervision of the Minor Research Project) - "Intensional Query Answering to XQuery Expressions".

Graduate Students Supervision/Co-Advisor

- From 2002 to 2018: advisor of several undergraduate and Master students in Computer Engineering at Politecnico di Milano.
- From 2019 - present: advisor of several undergraduate and Master students in Computer Science at Università di Verona.

PhD External Examiner

- PhD Committee member in 2025 at Politecnico di Torino, for the PhD defense of the candidate Doaa Almhaithawi discussing a thesis titled "Latent Space Dynamics and Security Implications in Machine Learning for Industrial Systems", Advisor Prof.ssa Tania Cerquitelli.
- PhD Committee member in 2024 at Politecnico di Torino, for the PhD defense of the candidate Salvatore Greco discussing a thesis titled "Inspecting Deep NLP Models Innovative Techniques for Explainability, Fairness, and Concept Drift in Natural Language Classification", Advisor Prof.ssa Tania Cerquitelli.
- PhD Committee member in 2024 at Politecnico di Torino, for the PhD defense of the candidate Luca Colomba discussing a thesis titled "Spatial data science: from aerial data to discrete spatio-temporal event analysis", Advisor Prof. Paolo Garza.
- PhD Committee member in 2023 at the Tampere University, Finland, for the PhD defense of the candidate Maria Stratigi discussing a thesis titled "Group Recommendations with Responsibility Constraints", Advisor Prof. Konstantinos Stefanidis.
- PhD Committee member in 2022 at Politecnico di Torino, for the PhD defense of the candidate Moreno La Quatra discussing a thesis titled "Deep Learning for Natural Language Understanding and Summarization", Advisor Prof. Luca Cagliero.
- PhD Committee member in 2021 at Politecnico di Torino, for the PhD defense of the candidate Andrea Pasini discussing a thesis titled "Semantics-aware image understandings", Advisor Prof.ssa Elena Baralis.
- PhD Committee member in 2019 at Politecnico di Torino, for the PhD defense of the candidate Mohammad Reza Kavoosifar discussing a thesis titled "Data Mining and Indexing Big Multimedia Data", Advisor Prof. ssa Elena Baralis.

Professional Activities

National, International Research Projects and other grants

I have been funded for the following research projects:

- Principal Investigator on *DIAMANTE: Dati e Intelligenza Artificiale a supporto di una coMunicazione trAsparente e di processi iNnovativi e sosTenibili per l'ambientE*, Bando Ricerca e Sviluppo 2026 - Fondazione Cariverona, Dec. 2026, 78.060 EU.
- Contract *Design and development of a relational database for a lithium cell manufacturing plant*, by Digatron System, EU 45.000 (2023).
- Contract *Data Analysis per le performance dei processi aziendali*, with CIM&Form, Fondirigenti, EU 10.000 (2020).
- 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.

I also contributes/contributed actively to the following research projects:

- *DataGEMS: Data discovery platform with Generalized Exploratory, Management, and Search capabilities*: HORIZON-INFRA-2024-EOSC-01-05: (Principal investigator: G. Koutrika).
- *Opera 4.0*: PROGETTO CARIVERONA, UNIVERSITÀ DI VERONA (Principal investigator: D. Quaglia).
- *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).

EDITORIAL BOARDS

- Data Science and Engineering (DSE) di Springer, Electronic ISSN 2364-1541 Print ISSN 2364-1185 (https://www.springer.com/journal/41019/editors) (2021 - present)

PROGRAM COMMITTEE MEMBERSHIP

Starting from 2002 until now, I have been serving on the program committee of several conferences, among which:

- *International Conference on Extending Database Technology)* (EDBT)
- *European Conference on Advances in Databases and Information Systems* (ADBIS)
- *IEEE International Conference on Data Science and Advanced Analytics* (DSAA)
- *International Conference on Advanced Information Systems Engineering* (CAISE)
- *Symposium on Advanced Database Systems* (SEDB).
- *Data Analytics solutions for Real-LIfe APplications* (DARLI-AP)

REFEREE SERVICES

I regularly serve as a reviewer for several conferences and journals, among which:

- **PVLDB Volume 7** (Proceedings of the VLDB Endowment, Volume 7).
- Elsevier Information Systems
- Frontiers in Big Data
- 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.

PAPER PRESENTATIONS

- "A Context-based Approach for Partitioning Big Data", at *EDBT*, 2020.
- "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 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 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's needs, and 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.16].

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 filtering (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.20], [JR.27];
- a survey and comparison of the most interesting approaches to context modelling and usage available in the literature [JR.30];
- a design methodology providing 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.20],[JR.24], [JR.27].

More research topics are: context-awareness in social media [IC.5]; automatic learning of unknown contexts [IC.6]; representation of context evolution [IC.25], contextual modeling of self-adaptive Computing Systems [IC.21].

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 recommendations or 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.19],[IC.23],[IC.27]. An application for mobile devices contextual that infers contextual preferences about the movie domain has been developed and presented in [IC.20]. We have also investigated how to recommend additional options or suggestions for future accesses, both to single users or a group of them, on the basis of the contextual past activities [IC.15],[IC.8].

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.22], [JR.31] 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.32].

Recently, data mining algorithms have been applied for Incremental Adaptive Functional Diagnosis in [IC.22].

Complete publication list

PUBLICATION LIST

Refereed international journals ____ 32
Referred books ____ 1
Refereed international book chapters ____ 9
Refereed international conferences ____ 43
Refereed national conferences ____ 11
Workshops ____ 14

REFEREED INTERNATIONAL JOURNALS

JR.1. A. Dalla Vecchia, N. Marastoni, B. Oliboni E. QUINTARELLI: ACTER: Activity Customization through Timely and Explainable Recommendations. *Information Systems* 138: 102666 (2026) [doi: https://doi.org/10.1016/j.is.2025.102666]

JR.2. A. Dalla Vecchia, S. Migliorini, E. QUINTARELLI, K. Stefanidis: Multi-sided fairness in sequential task assignment. *Information Systems* 139: 102700 (2026) [doi: https://doi.org/10.1016/j.is.2026.102700]

JR.3. A. Dalla Vecchia, S. Migliorini, E. QUINTARELLI, M. Gambini, A. Belussi: Promoting sustainable tourism by recommending sequences of attractions with deep reinforcement learning. *J. Inf. Technol. Tourism* 26(3): 449-484 (2024) [doi: https://doi.org/10.1007/s40558-024-00288-x]

JR.4. F. Cunico, S. Aldegheri, A. Avogaro, M. Boldo, N. Bombieri, L. Capogrosso, A. Caputo, D. Carra, S. Centomo, D. Seon Cheng, E. Cinquetti, M. Cristani, M. De Marchi, F. Demrozi, M. Emporio, F. Fummi, L. Geretti, S. Germiniani, A. Giachetti, F. Girella, E. Martini, G. Menegaz, N. Muijs, F. Paci, M. Panato, G. Pravadelli, E. QUINTARELLI, I. Siviero, S. F. Storti, C. Tadiello, C. Turetta, T. Villa, N. Zannone, D. Quaglia: Enhancing Safety and Privacy in Industry 4.0: The ICE Laboratory Case Study. *IEEE Access* 12: 154570-154599 (2024) [doi: https://doi.org/10.1109/ACCESS.2024.3479411]

JR.5. S. Migliorini, Mauro Gambini, E. QUINTARELLI, A. Belussi:
Tracking social provenance in chains of retweets. *Knowledge and Information Systems*, ISSN: 0219-1377 (2023)
[doi: https://doi.org/10.1007/s10115-023-01878-7]

JR.6. 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)
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Elisa Quintarelli