Enrico Gallinucci

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CITIZENSHIP
Italian

CURRENT PLACEMENT
Alma Mater Studiorum Università di Bologna
Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

- Researcher in Tenure Track (RTT)

RESEARCH THEMES
My research activities are focused on the fields of Business Intelligence and Big Data, with a particular interest in the aspects of data modeling, integration and analysis, both from the methodological and algorithmic perspectives. Current research topics include: the design of multistore systems to manage data integration and the optimization of query executions; the identification of optimal schemas in NoSQL databases; the profiling of streams of highly heterogeneous data; the development of smart approaches to support the data scientist in searching, organizing and analyzing data in a big data environment. I am involved in several projects to deploy my research efforts in practical applications, especially in the precision agriculture sector.

RESEARCH METRICS
Scopus
- H-index: 14
- H-index (without self-citations): 11
- Number of citations: 1346
- Number of citations (without self-citations): 1171

Google Scholar
- H-index: 16
- I10-index: 23
- Number of citations: 838

AWARDS
Best Demonstration Award [25], EDBT 2021, Nicosia, Cyprus

Best Paper Award [20], DOLAP 2025, Barcelona, Spain

PATENTS
Method and System for Soil-Moisture Monitoring
October 18, 2023 - Registration number: 102021000023162

EDUCATION & CERTIFICATIONS

EDUCATION
Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Ph.D. in Computer Science and Engineering, May 2017

- Grade: "Ottimo"
- Thesis title: *Business Intelligence on Non-Conventional Data*
- Thesis topic: extending traditional Business Intelligence techniques to store, integrate and analyze non-conventional data.
  - Analysis of semantically-enriched semi-/unstructured data in advanced BI systems, with a particular focus on social network content.
  - Enhancement of multidimensional cubes in enterprise data warehouses through the integration of linked data.

    - Definition of schema profiling and analysis techniques over NoSQL database systems in a Big Data context.
  - Supervisor: Prof. Stefano Rizzi
  - Tutor: Prof. Matteo Golfarelli
  - External reviewer: Prof. Robert Wrembel
  - External reviewer: Prof. Esteban Zimanyi
  - Area of Study: Business Intelligence 2.0

Master's Degree in Computer Science and Information Technology, March 2013

  - *110L/110 - Cum Laude*
  - Thesis title: *DyNAmITE: Digital fighting tax evasion through data integration and analysis*
  - Thesis topic: identification of potential tax evaders by integrating heterogeneous datasets and finding patterns describing fraudulent behaviors, followed by the development of a what-if predictive system to study fiscal fairness; conducted in collaboration with the Municipality of Cesena.
  - Supervisor: Prof. Matteo Golfarelli
  - Area of Study: Data Mining

Bachelor's Degree in Computer Science and Information Technology, October 2010

  - *105/110*
  - Thesis topic: Development of a digital exam record-book.
  - Supervisor: Prof. Antonella Carbonaro
  - Area of Study: Web Development

ITIS N. Baldini, Ravenna (RA), Italy

Scientific high school, focus on computer science, July 2007

  - 90/100

Doctoral schools

eBISS 2023
Eleventh European Business Intelligence Summer School; Barcelona, Spain

eBISS 2022
Tenth European Business Intelligence Summer School; Cesena, Italy

eBISS 2015
Fifth European Business Intelligence Summer School; Barcelona, Spain

BISS 2014
Bertinoro International Spring School; Bertinoro, Italy

Master programmes

ITP 2025
International Teachers Programme; Stockholm, Sweden

Certifications

Abilitazione Scientifica Nazionale al ruolo di professore di II fascia
Code **09/H1** — Information processing systems
Italian Ministry of Universities and Research
Starting 2023-06-15, ending 2035-06-15

Abilitazione Scientifica Nazionale al ruolo di professore di II fascia
Code **01/B1** — Informatics
Italian Ministry of Universities and Research
Starting 2022-06-01, ending 2034-06-01

Research positions

Research contracts

RESEARCHER IN TENURE TRACK (RTT) **2024-02-08 — today**
Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Six-year fixed-term research and teaching position. Research activities are focused on the themes of Data Science, Artificial Intelligence, and Internet of Things.

JUNIOR ASSISTANT PROFESSOR (RTD-A) **2021-06-15 — 2024-02-07**
Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Three-year fixed-term research and teaching position. The main research theme is "Polyglot systems for data analysis".

POST-DOC RESEARCH FELLOW **2017-01-01 — 2021-06-02**
Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Contract type	Title	Start date	End date	Duration
Research grant	Bringing intelligence to the big data lake through smart metadata management	2020-04-03	2021-06-02	14 months
Research grant	Enabling OLAP on heterogeneous sources	2019-04-03	2020-04-02	1 year
Research grant	Flexible OLAP Analyses over NoSQL Databases	2018-04-03	2019-04-02	1 year
Term contract	Completion and consolidation of the MO.RE.Farming data platform	2018-01-01	2018-03-31	3 months
Research grant	Analysis of agri-food products' shelf-life quality and security	2017-01-01	2017-12-31	1 year

NOTE: Research grant = Assegno di ricerca. Term contract = Contratto di collaborazione continuativo.

Main research activities:

- Research and design of schema profiling techniques and OLAP analyses over NoSQL databases, even in presence of multiple storage systems (i.e., multistore).
- Predictive analytics and optimization of the execution of OLAP queries over SparkSQL and multistores through the development of advanced cost models.
- Envisioning and prototyping of a Big Data Platform approach to support data management and transformation within Data Lakes.
- Application of innovative and scalable techniques to analyze, anonymize and de-anonymize trajectory data.
- Profiling of social network users based on social interaction focused on topics like vaccines and politics.
- Design and development of a Big Data platform to support the analysis and spatial integration of information applied in the field of precision agriculture.
- Design and development of an approach to vocalize OLAP queries over data warehouses.

PH.D. STUDENT **2014-01-01 — 2016-12-31**
Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Covered by a grant from the Italian Ministry of Research. I kept working on the research themes from the previous contract and contributed to novel proposals in the fields of Social BI, Exploratory BI, and Pervasive BI.

RESEARCH FELLOW **2013-04-05 — 2013-12-31**

Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Contract type	Title	Start date	End date	Duration
Research grant	Business Intelligence on Non-Conventional Data	2013-04-05	2013-12-31	8 months

NOTE: Research grant = Assegno di ricerca.

Research activity: I began my research activities in the fields of Social Business Intelligence and OLAP recommendation, envisioning analysis techniques for semantically-enriched semi-/unstructured data in advanced BI systems.

Teaching

University courses

PH.D. COURSES (teacher)

Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Course name	Degree programme	A.Y.	Hours
From Big Data to Data Platform - Research and Challenges	PhD in Computer Science and Engineering	2021/22	10

MASTER'S DEGREE (MD) COURSES (teacher with course responsibility)

Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Course name	Degree programme	A.Y.	CFU/ ECTS	Hours	CS	ACS	NR
Big Data (Mod.2)	MD in CSE	2025/26	6	30	TBD	TBD	TBD
Big Data (Mod.1)	MD in CSE	2025/26	6	20	TBD	TBD	TBD
Big Data (Mod.2)	MD in CSE	2024/25	6	30	85.7%	85.1%	21
Big Data (Mod.1)	MD in CSE	2024/25	6	20	89.3%	85.1%	28
Big Data (Mod.2)	MD in CSE	2023/24	6	30	88.2%	83.4%	18
Big Data (Mod.1)	MD in CSE	2023/24	6	20	96.7%	83.4%	30
Big Data (Mod.2)	MD in CSE	2022/23	6	30	100%	81.2%	12
Big Data (Mod.1)	MD in CSE	2022/23	6	20	89.3%	81.2%	29
Big Data	MD in CSE	2021/22	6	50	NA*	–	–
Big Data (Mod.1)	MD in CSE	2020/21	6	40	NA*	–	–
Big Data (Mod.1)	MD in CSE	2019/20	6	40	NA*	–	–
Big Data (Mod.1)	MD in CSE	2018/19	6	40	94.7%	79.6%	19
Big Data (Mod.1)	MD in CSE	2017/18	6	40	83.3%	78.1%	12

NOTES: Students submit an anonymous form where they can express their opinion about several aspects of the course in a four-valued scale (very negative, negative, positive, very positive). Such evaluations are reported here as follows:

CS: course satisfaction (where NA* is indicated, data is not to be used for public comparative evaluations due to the effects of Covid-19 on education);

ACS: average course satisfaction within the School or the VRA area;

NR: number of respondents.

CS and *ACS* report the fraction of students evaluating the course positively or very positively.

MASTER'S DEGREE (MD) COURSES (teacher without course responsibility)

Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Course name	Degree programme	A.Y.	CFU/ ECTS	Hours	CS	ACS	NR
Big Data and Cloud Platforms (Mod.1)*	MD in DTM	2025/26	6	20	TBD	TBD	TBD
Programming and Computer Architectures (Mod.2)	MD in DTM	2025/26	12	36	TBD	TBD	TBD
Business Intelligence (Mod.2)	MD in CSE	2025/26	6	10	TBD	TBD	TBD
Big Data and Cloud Platforms (Mod.1)*	MD in DTM	2024/25	6	20	89.3%	85.1%	28
Programming and Computer Architectures (Mod.2)	MD in DTM	2024/25	12	36	93.3%	85.1%	15
Business Intelligence (Mod.2)	MD in CSE	2024/25	6	10	90.9%	85.1%	11
Big Data and Cloud Platforms (Mod.1)*	MD in DTM	2023/24	6	20	96.7%	83.4%	18
Programming and Computer Architectures (Mod.2)	MD in DTM	2023/24	12	36	70.6%	83.4%	30
Business Intelligence (Mod.2)	MD in CSE	2023/24	6	10	75.0%	83.4%	16
Big Data and Cloud Platforms (Mod.1)*	MD in DTM	2022/23	6	20	89.3%	81.2%	29
Business Intelligence (Mod.2)	MD in CSE	2022/23	6	10	64.7%	81.2%	17
Business Intelligence (Mod.2)	MD in CSE	2021/22	6	10	NA*	–	–

NOTE: legend as above. Also, the course "*Big Data and Cloud Platforms (Mod.1)*" for DTM, marked with *, is borrowed (in Italian, *mutuato*) from the course "*Big Data (Mod.1)*" for CSE of the same A.Y. (in the table above).

Université de Tours, Blois, France (through *Erasmus+ Staff Mobility For Teaching*)

Course name	Degree programme	A.Y.	CFU/ ECTS	Hours
Big Data and Cloud Computing	Big Data Management and Analytics (BDMA)	2022/23	5	10

BACHELOR'S DEGREE (BD) COURSES (teaching tutor)

Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

Course name	Degree programme	A.Y.	CFU/ ECTS	Hours
Lab-based Course on Databases	BD in CSE	2015/16	4	30
Lab-based Course on Databases	BD in CSE	2014/15	4	30
Lab-based Course on Databases	BD in CSE	2013/14	4	30

THESES SUPERVISION

MASTER THESIS (supervisor)

MD in DTM @ Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

- Alessio Colombari: *AI-Driven Purchase Order Processing: Automating Business Workflows with Artificial Intelligence*, 2025
- Andreea Diana Gherghescu: *Assessing the Feasibility of Retrieval Augmented Generation for Materiality Analysis*, 2025
- Leilya Imanbayeva: *LLM-Assisted ESG Data Extraction from Corporate Reports*, 2025
- Alibek Marat: *A Study of Data Migration Efforts in NoSQL Databases*, 2025
- Viola Morgia: *A Comparative Analysis of LLM-Enhanced Business Intelligence Tools at Amadori*, 2025
- Andrea Yuki Alvisi: *Prediction of Revenue and Expenses through Time-Series Analyses*, 2024

- Chiara Bertocchi: *Journey Automation - Digital Transformation in the Wellness Industry*, 2024
- Riccardo Bellesia: *Towards the Adoption of the Data Mesh Paradigm at ADEO*, 2024
- Cecilia Mina Rattini: *Data Analytics Methodologies to leverage Digital Technologies*, 2024
- Iliyas Ysmaiyl: *An Exploratory Study of Conceptual Modeling for Data Warehousing using LLMs*, 2024
- Sara Amaducci: *Analysis of Opportunities and Challenges in the Buy-Now Pay-Later Business Model for FinTech*, 2023
- Federica Dell'Orletta: *Design and Development of a Data Mart for the HR Department at Amadori*, 2023

MD in CSE @ Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

- Mert Akpinar: *Automation and Cost Estimation of Query Executions on Document-Based Databases*, 2025
- Luca Rubboli: *Evaluating Large Language Models for Dimensional Fact Model Design with Automated Pipelines*, 2025
- Alex Baiardi: *Progettazione di una soluzione di Business Intelligence a supporto dei processi decisionali presso Agrintesa*, 2024
- Veronika Folin: *Engineering Data Pipelines and Analytics with DataOps*, 2024
- Michele Mongardi: *Implementazione di una Data Platform nel settore Multiutility*, 2024
- Angelo Parrinello: *Benchmarking Materialized Views of SQL-based Stream Processing Systems*, 2024
- Vlad Mattiussi: *Progettazione di una Piattaforma Cloud per Analisi Predittive in Ambito Industria 4.0*, 2023
- Andrea Giannini: *Social Network Analysis: Architettura Streaming Big Data di Raccolta e Analisi Dati da Twitter*, 2022
- Riccardo Maldini: *Pairs Trading: Sviluppo e Ottimizzazione di un Modello di Investimento Basato sul Machine Learning*, 2021
- Enrico Salvucci: *MLOps - Standardizing the Machine Learning Workflow*, 2021
- Tommaso Bombardi: *Compressione e Vocalizzazione di Risultati Multidimensionali nel Paradigma OLAP*, 2021
- Marta Luffarelli: *A Text Mining Approach to Materiality Assessment*, 2021
- Maria Maddalena Mascellaro: *Pubblicazione di Dati di Traiettoria preservando il Principio di non Informatività*, 2021
- Alex Ravaglia: *Riconoscimento di Frodi attraverso la Modellazione del Comportamento degli Utenti*, 2021
- Riccardo Salvatori: *Analisi delle Strategie di Modellazione dei Dati su Database NoSQL*, 2021
- Luca Semprini: *Anonimizzazione Incrementale di Dati di Traiettoria*, 2020
- Eugenio Cavina: *GEAR: una Piattaforma Big Data per l'Elaborazione di Stream di Dati attraverso Machine Learning e Business Rules*, 2020
- Anna Giulia Leoni: *Gestione di un Data Lake Strutturato attraverso il Riconoscimento Semantico dei Dati Acquisiti*, 2019

MASTER THESIS (co-supervisor)

MD in CSE @ Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

- Yuqi Sun: *Selezione di un data catalog per l'azienda Bonfiglioli S.p.A.*, 2024.
- Chiara Forresi: *Un Framework per l'Analisi di Big Data con Elevata Eterogeneità all'Interno di Multistore*, 2020.
- Rrok Gjinaj: *Progettazione e Prototipazione di un Sistema di Conversational BI*, 2020.
- Nicola Santolini: *Utilizzo di Dati Social per la Deanonimizzazione di Tracce GPS*, 2019.
- Giovanni Di Meo: *Analisi delle Comunità Twitter legate al Tema dei Vaccini*, 2018.
- Alessio Addimando: *Progettazione di un Intrusion Detection System su Piattaforma Big Data*,

2018.

BACHELOR THESIS (co-supervisor)

BD in CSE @ Università di Bologna, Dept. of Computer Science and Engineering (DISI), Cesena (FC), Italy

- Luca Paoloni: *Estrazione Automatica degli Schemi di una Collection all'Interno di un DBMS NoSQL e Calcolo delle Dipendenze Funzionali tra gli Attributi dello Schema*, 2019.
- Shapour Nemati: *Un Sistema per l'Acquisizione Automatica dei Metadati per SparkSQL*, 2018.
- Alessandro Collerà: *Classificazione e Selezione di Tecniche di Visualizzazione per Big Data Analytics*, 2016.
- Francesco Capponi: *Analisi della Piattaforma Nutch*, 2016.
- Antony Chiossi: *Progettazione e Prototipazione di un Sistema di Social Business Intelligence con Hadoop Impala*, 2015.
- Luca Longobardi: *Progettazione e Prototipazione di un Sistema di Social Business Intelligence con ElasticSearch*, 2015.

Business School courses

COURSES IN PROFESSIONAL MASTER PROGRAMMES (teacher without course responsibility)

Bologna Business School (BBS), Bologna (BO), Italy

Course name	Master programme	A.Y.	Hours
Fundamentals of BI	Data Marketing and Analytics	2025/26	11
Data Mining	Data Science	2025/26	8.5
Fundamentals of BI	Data Marketing and Analytics	2024/25	11
Data Mining	Data Science	2024/25	8.5
Fundamentals of BI	Data Marketing and Analytics	2023/24	11
Data Mining	Data Science	2023/24	8.5
Fundamentals of BI	Data Marketing and Analytics	2022/23	11
Data Mining	Data Science	2022/23	8.5
Fundamentals of BI	Data Marketing and Analytics	2021/22	10
Data Mining	Data Science	2021/22	9

COURSES IN OPEN/CUSTOM MASTER PROGRAMMES (teacher without course responsibility)

Bologna Business School (BBS), Bologna (BO), Italy

Course name	Executive programme	Year	Hours
Integrated Analytics Lab	Data Strategy & Analytics	2026	4
Integrated Analytics Lab	Data Strategy & Analytics	2025	4
Integrated Analytics Lab	Data Strategy & Analytics	2024	4
Social BI & Location Intelligence	Data Strategy & Analytics	2023	8
Data Analysis & Analytics	Digital Transformation Program (@ SCM)	2023	12
Social BI & Location Intelligence	Data Strategy & Analytics	2022	8
Big Data, Data Analysis & AI	Digital Transformation Program (@ SCM)	2022	32
Data Analysis & Analytics	Digital Transformation Program (@ SCM)	2022	48
Social BI & Location Intelligence	Data Strategy & Analytics	2021	8
Integrated Analytics Lab	Data Strategy & Analytics	2021	8
Big Data	Big Data (@ Philip Morris)	2019	12
Data and platforms	Master in Internet of Things	2019	6

COURSES IN PROFESSIONAL MASTER PROGRAMMES (teaching tutor)

Bologna Business School (BBS), Bologna (BO), Italy

Course name	Master programme	A.Y.	Hours
BI and Data Warehouse	Data Science	2025/26	11
BI and Data Warehouse	Data Science	2024/25	11
BI and Data Warehouse	Data Science	2023/24	11
BI and Data Warehouse	Data Science	2022/23	11
BI and Data Warehouse	Data Science	2021/22	11
BI and Data Warehouse	Data Science	2020/21	11
BI and Data Warehouse	Finance and Fintech	2020/21	11
BI and Data Warehouse	Data Science	2019/20	11
BI and Data Warehouse	Finance and Fintech	2019/20	11
BI and Data Warehouse	Data Science	2018/19	10
BI and Data Warehouse	Data Science	2017/18	10
Information Systems	Finance, Control and Auditing	2016/17	6
Information Systems	Finance, Control and Auditing	2015/16	6
Information Systems	Finance, Control and Auditing	2014/15	6
Information Systems	Finance, Control and Auditing	2013/14	6
Information Systems	Business Management	2013/14	6

Other courses

COURSES IN HIGHER TECHNICAL INSTITUTE (teacher)

FITSTIC, Cesena (FC), Italy

Course name	Professional programme	A.Y.	Hours
Introduction to NoSQL systems	Alan Turing 5th edition	2020/21	30
Introduction to NoSQL systems	Alan Turing 4th edition	2019/20	30
Introduction to NoSQL systems	Alan Turing 3rd edition	2018/19	30
Introduction to NoSQL systems	Alan Turing 2nd edition	2017/18	40
Introduction to NoSQL systems	Alan Turing 1st edition	2016/17	50
Introduction to database systems	Alan Turing 1st edition	2016/17	50

PROFESSIONAL TRAINING COURSES (teacher)

Futura, San Giovanni in Persiceto (BO), Italy

Professional programme	A.Y.	Hours
Analyst specialized in data warehousing and integrated information systems	2014/15	20

Research projects

Academic research projects

AI4AgriHub **2025 - today**

Type: CoPSR 2023-2027, SRG09

Role: **Principal Investigator for UNIBO**
Funding UNIBO: 30.000€

The project "AI4AgriHub - Feasibility Study and Strategies for Artificial Intelligence in Agriculture" aims to launch a structured pathway of listening, dialogue, and co-design within a proposed Innovation Hub. Its overall objective is to jointly develop innovative solutions and strengthen cooperation among agricultural enterprises, research institutions, consultants, and other AKIS (Agricultural Knowledge and Innovation System) actors, with regard to the adoption of Artificial Intelligence in the agricultural and agri-food sector.

AGRITECH Spoke N. 3 - Sustainable Technologies **2023 - 2025**
Type: Fondi PNRR, Bando CN - Progetto AGRI, "National Research Centre for Agricultural Technologies", Codice CN00000022, CUP: J33C22001150008

In the context of Spoke 3 of the Agritech National Research Centre, we participate in Task 3.1.5, *"AI and big-data analytics for the sustainability of production systems"*. The WP will generate a vast amount of data throughout its tasks, enabling the adoption of AI and big-data analytics solutions to improve the efficiency of use of water and fertilizers, as well as labour, machines, and chemicals. Collection, management and exploitation of generated data requires the design and implementation of agri-specific big data hub that integrates and makes information available and that allows the development of analytics (descriptive, predictive, and prescriptive) that will be developed consistently with, and to be functional to, research conducted in all other tasks.

WeLASER **2020 - 2023**
Type: H2020-SFS-2018-2020

The increased use of pesticides and fertilizers damages the environment, destroys non-target plants and beneficial insects for the soil, and harms human and animal health. Most seeds develop herbicide-resistant properties, rendering pesticides ineffective. Mechanical automatic systems that are studied as alternatives to pesticides deteriorate soil features, damage beneficial soil organisms, and offer limited results for in-row weeding. The project will develop a non-chemical solution for weed management based on pioneering technology consisting of the application of lethal doses of energy on the weed meristems through a high-power laser source. An AI-vision system separates crops from weeds, identifying the weed meristems and pointing the laser at them. A smart controller based on IoT and cloud computing techniques coordinates the system, which is transferred all over the field by an autonomous vehicle.

TOREADOR: TrustwOrthy model-awaRE Analytics Data platfORm **2016 - 2017**
Type: H2020 - Big Data: Research

The TOREADOR project is aimed at overcoming some major hurdles that until now have prevented many European companies from reaping the full benefits of Big Data analytics (BDA). To this end, the delivery of TOREADOR is an architectural framework and a set of components for model-driven set-up and management of BDA processes; the goal is to address automatically all major problems of on-demand data preparation, including handling Big Data opacity, diversity, security, and privacy compliance, as well as to support abstract modeling of the BDA life cycle.

WebPolEU **2013 - 2015**
Type: FIRB 2012

Social media are widespread and are an integral part of people's daily lives. Web 2.0 is one of the social environments in which citizens manage a significant part of their relationships and become aware of political information and opportunities to be involved in the public sphere. Political actors also have to deal with these forums, and their strategies can help alleviate or exacerbate the crisis of citizens' trust towards parties and institutions. The project will address all these aspects, integrating qualitative and quantitative methods in a comparative perspective. In particular, the research will analyze the digital literacy of young people, the political behavior of online citizens, the content and methods of political discussions on social media, and strategies for online communication of institutional political actors. The European political elections in 2014 serve as the primary focus of the research project.

Piano Cimice.Net **2020 - today**
Type: PSR 2014-2020 Op. 16.1.01 - Go Pei-Agri Focus Area 4B

The goal of the project is to create an online platform to collect, process, and analyze data on the presence of Halyomorpha halys populations in the main fruit areas of the region. The real-time visualization of the data provides punctual and reliable monitoring information, thus constantly supporting technicians and farmers in the adoption of a more rational management in the field

of strategies for fighting the Asian bedbug. These data, collected over a period of two years, will be integrated with meteorological measurements and territorial characteristics. This will make it possible to identify biotic or abiotic environmental factors that influence the presence of Halyomorpha halys and its harmfulness in a specific territory and thus facilitate the definition of intervention strategies, including those of a territorial nature.

Agro.Big.Data.Science **2019 - 2021**
Type: POR-FESR 2014-2020 - Asse 1 Ricerca e innovazione

The growing availability of technologically advanced sensors capable of gathering various information along all the links of the agro-food chain allows to face the problems related to the diagnosis, forecasting, and improvement of the supply chains, with a data-driven approach. The project intends to apply the data-driven logic to 3 production chains (kiwi, pear, and spinach) made available by the companies participating in the project, complete with the sensors for real-time data collection. Data collection and analysis will be managed by a Big Data platform specific to the agro-food sector, designed to be flexible and usable also by different supply chains.

Mo.Re.Farming **2016 - 2018**
Type: POR-FESR 2014-2020 - Asse 1 Ricerca e innovazione

The project intends to develop a data collection and management platform, that integrates enterprise data with public datasets to support technicians and farmers in the decision-making process and to promote more sustainable cultivation techniques (i.e., precision farming). To achieve this goal, the project aims to develop innovative ways of monitoring the status of the soil and the plant (in-situ sensors) and their spatial variability (satellite remote sensing, use of drones). It also intends to arrange an integrated data hub, overcoming the lack of interchange between public and private sources (e.g., agronomic, meteorological), so as to offer high-value information for the decision-making process.

Innofruve **2017**
Type: POR-FESR 2014-2020 - Asse 1 Ricerca e innovazione

The goal of the project is to foster innovation in the regional agro-food industry, the qualitative and functional improvement of various vegetable products, and the enhancement of waste processing. This is done by monitoring and analysing the decay of the organoleptic properties of products, from the primary production process and throughout the cold chain. Innovative technologies will be studied to stabilize and increase the shelf-life of minimally-processed fruit and vegetable preserves.

Research projects commissioned by third parties

Data Assessment and Data Strategy Definition **2023**
Commissioned by EasyMarket, Rimini (RN), Italy

Scientific coordinator of the project commissioned by EasyMarket, an online travel agency. The goal was to define a data strategy for the company, by drawing a roadmap towards a data-driven decision-making process built on top of the collection, integration, and exploitation of big data (in the form of events collected in real-time from internal servers and statistics collected daily from external providers) in a cloud data platform.

Data Platform Refinement and Analysis of Cimice.Net Data **2022 - today**
Commissioned by Ri.Nova soc. coop., Cesena (FC), Italy

Continuation of the Cimice.Net research project to refine the data platform that supports the monitoring network to capture brown marmorated stink bugs in Emilia-Romagna and analysis of the collected data to discover interesting patterns.

Reduction of the Impact of Brown Spot on Pear Trees **2020**
Commissioned by C.R.P.V. soc. coop., Cesena (FC), Italy

Project to analyze datasets of questionnaires collected from farmers in the Emilia-Romagna region to uncover patterns in the spread of the *brown spot* infection in pear trees.

Processing and Analysis of Business Documents and Social Data **2017 - 2019**
Commissioned by RE2N S.r.l., Cesena (FC), Italy

Project to apply the methodologies and techniques developed in the context of Social Business Intelligence to aid the task of *materiality assessment* through the analysis of the text in business documents and social media content.

Analysis of Social Media Discussions on Vaccines **2015 - 2016**
Commissioned by Onit S.r.l., Cesena (FC), Italy

Collaboration with the Veneto region to analyze the discussions on social media concerning vaccines and related fears, to obtain a profile of the existing communities and support strategies to tackle the drop in voluntary vaccinations.

Service

Institutional roles

Supervisor of the Erasmus+ Bilateral Agreement with the Facultat d'Informàtica de Barcelona (FIB), Universitat Politècnica de Catalunya (UPC), Spain **2025 - today**

The Bilateral Agreement with FIB-UPC offers 2 incoming and 2 outgoing positions for students, as well as 1 incoming and 1 outgoing position for teachers, for every academic year. The main activities consist in selecting and approving incoming/outgoing requests and supporting students in the definition of a consistent study plan.

Chair of the Internship Committee for the Master's Degree in Digital Transformation Management, University of Bologna **2022 - today**

The main activities consist in coordinating the works of the committee regarding (i) the approval of conventions with companies, (ii) approval of internship proposals by companies, (iii) the verbalization of internship activities. In this role, I also organize an yearly *handshake day* for sponsor companies to present their internship proposals to students and facilitate the latter in finding appealing and valuable internships.

Chair of the Website Committee for the Master's Degree in Computer Science and Engineering, University of Bologna **2025 - today**

The main activities consist in updating the content of the website and ensuring its consistency across languages and curricula, with particular reference to the complex and heterogeneous structure of the Master's Degree in terms of curricula, profiles, international programmes, and selection methods.

Service in international journals

Data & Knowledge Engineering (Elsevier)
Associate Editor - since 2022

International Journal of Data Mining, Modelling and Management
Editorial Board member - since 2021

Information Systems (Elsevier), Special issue on DOLAP 2024: Design, Optimization, Languages and Analytical Processing of Big Data
Guest Editor (2024)

Journal of Big Data (Springer), Special issue on Advancements on Automated Data Platform Management, Orchestration, and Optimization
Guest Editor (2024)

Information Systems (Elsevier), Special issue on DOLAP 2023: Design, Optimization, Languages and Analytical Processing of Big Data
Guest Editor (2023)

Information Systems Frontiers (Springer), Special Issue on Advances in Data Platform Design, Management, and Optimization
Guest Editor (2023)

Frontiers in Big Data (Frontiers), Special Issue on Big Data and Decision Support Systems for Precision Agriculture
Topic Editor (2023)

Future Generation Computer Systems (Elsevier), Special Issue on Advances in Data Platform Design, Management, and Optimization
Managing Guest Editor (2022)

Electronics (MDPI), Special Issue on Big Data and Artificial Intelligence for Industry 4.0
Guest Editor (2021)

Service in international conferences

30th European Conference on Advances in Databases and Information Systems (ADBIS 2026)
Doctoral Consortium School Chair

29th European Conference on Advances in Databases and Information Systems (ADBIS 2025)
Doctoral Consortium School Chair

The 43rd International Conference on Conceptual Modeling (ER 2024)
CEUR Proceedings Chair

26th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2024)
Program Chair

25th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2023)
Program Chair

3rd International Workshop on Data Platform Design, Management, and Optimization (DataPlat 2024)
Founder, Program Chair

2nd International Workshop on Data Platform Design, Management, and Optimization (DataPlat 2023)
Founder, Program Chair

1st International Workshop on Data Platform Design, Management, and Optimization (DataPlat 2022)
Founder, Program Chair

Program Committee member of the following conferences.

- ICDE (IEEE International Conference on Data Engineering): 2026
- CIKM (ACM International Conference on Information and Knowledge Management): 2025, 2024
- ER (International Conference on Conceptual Modeling): 2024
- DOLAP (International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data): 2026, 2025
- ADBIS (European Conference on Advances in Databases and Information Systems): 2024, 2017 (DC)
- DaWaK (International Conference on Big Data Analytics and Knowledge Discovery): 2025, 2024, 2023, 2022, 2021
- MEDI (International Conference on Model and Data Engineering): 2022, 2021, 2019, 2018
- ICBDR (International Conference on Big Data Research): 2023

- BIS-BDP (Business Intelligence Systems and Big Data Processing): 2026, 2025, 2024, 2023, 2022, 2021, 2020, 2019, 2018
- HUSO (International Conference on Human and Social Analytics): 2023
- iiWAS (International Conference on Information Integration and Web Intelligence): 2022
- QUACA (International Workshop on Qualitative Aspects of User-Centered Analytics): 2020

Service in Ph.D. programs

External Commissioner in the DEDS Doctoral Colloquium, Barcelona (2023)

Reviewing for international journals

Journal of Big Data (JOBD), 2025

Transactions on Database Systems (TODS), 2024

Data & Knowledge Engineering (DKE), 2014, 2015, 2022, 2023, 2024, 2025

Information Systems (IS), 2018, 2021, 2023, 2025

Expert Systems with Applications (ESWA), 2021, 2023

International Journal of General Systems, 2022

Computing Surveys (CSUR), 2021

Knowledge and Information Systems (KAIS), 2020

Journal on Data Semantics (JoDS), 2020

Scientific Programming, 2020

Semantic Web journal (SWJ), 2020

Agriculture, 2019

Future Generation Computer Systems (FGCS), 2019

Information Systems Frontiers (ISF), 2019

International Journal of Data Warehousing and Mining (IJDWM), 2014

International experience & Invitations

Participation in research groups

Business Intelligence Group **2013 - today**

The primary research group I am working with. The main focus of the group is on studying the architectures, techniques, and methodologies aimed at extracting value from data in the most diverse business contexts. The group is lead by Prof. Stefano Rizzi and Prof. Matteo Golfarelli, and operates in the University of Bologna.

DTIM Group **2014 - 2015; 2023 - today**

Collaboration with the Database Technologies and Information Management research group at the Universitat Politècnica de Catalunya (Barcelona, Spain) led by Prof. Alberto Abelló and Prof. Oscar Romero. The collaboration first focused on creating innovation in the field of Exploratory Business Intelligence (during my Ph.D.), with a specific emphasis on leveraging linked data to enhance multidimensional cubes. It resumed in 2023 to work on modeling design strategies for data in NoSQL databases.

Université de Tours, France **2014 - 2015; 2020 - 2024**

Collaboration with the research group of Prof. Patrick Marcel (now at Université de Orléans, France). The objective of the collaboration during my Ph.D. was focused on defining innovative recommendation strategies for OLAP sessions on data warehouses. The collaboration resumed in 2020 to study data warehouse modeling techniques in multi-model contexts (combining, for example, the relational model with the new models proposed by NoSQL technologies).

CIRI-ICT **June 2021 - today**

CIRI-ICT is the interdepartmental industrial research center of the University of Bologna for information and communication technologies. Its mission is to promote technology transfer and support innovation for large, medium, and small businesses in the area.

CINI **2016 - today**

CINI (National Interuniversity Consortium for Informatics) is the main point of reference for the Italian national academic research in the fields of Computer Science, Computer Engineering, and Information Technology. In a very strict cooperation with the national scientific communities, the Consortium promotes and coordinates scientific activities of research and technological transfer, both basic and applicative, in several fields of Computer Science and Computer Engineering,

Visiting periods

Universitat Politècnica de Catalunya, Barcelona, Spain

Visiting Researcher **October 6, 2014 to February 5, 2015**

- Research on enhancing multidimensional cubes through linked data.
- UPC supervisor: Prof. Alberto Abelló
- UniBo supervisor: Prof. Matteo Golfarelli

Visiting Researcher **April 11, 2023 to August 16, 2023**

- Initiation of a long-term collaboration on the topic of data modeling design strategies in NoSQL databases.
- UPC supervisor: Prof. Alberto Abelló
- UniBo supervisor: Prof. Matteo Golfarelli

Participation in international conferences

Participation as Chair of the Doctoral Consortium School
29th European Conference on Advances in Databases and Information Systems (ADBIS 2025)

Presentation of "Impact Study of NoSQL Refactoring in SkyServer Database" [20]
27th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2025)

Participation
27th International Conference on Extending Database Technology (EDBT 2024)

Participation as Program Chair
26th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2024)

Participation
26th International Conference on Extending Database Technology (EDBT 2023)

Participation as Program Chair
25th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2023)

Presentation of "Extracting Insights Over Multidimensional Data" [39]
30th Italian Symposium on Advanced Database Systems (SEBD 2022)

Presentation of "OLAP Querying of Document Stores in the Presence of Schema Variety" [40]
28th Italian Symposium on Advanced Database Systems (SEBD 2020)

Presentation of "A Hybrid Architecture for Tactical and Strategic Precision Agriculture" [27]
21st International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2019)

Presentation of "Variety-Aware OLAP of Document-Oriented Databases" [31]
20th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2018)

Participation
21st International Conference on Extending Database Technology (EDBT 2018)

Presentation of "Schema Profiling of Document Stores" [42]
25th Italian Symposium on Advanced Database Systems (SEBD 2017)

Presentation of "Social Business Intelligence in Action" [33]
28th International Conference on Advanced Information Systems Engineering (CAiSE 2016)

Presentation of "Towards Exploratory OLAP on Linked Data" [43]
24th Italian Symposium on Advanced Database Systems (SEBD 2016)

Presentation of "Meta-Stars: Dynamic, Schemaless, and Semantically-Rich Topic Hierarchies in Social BI" [34]
18th International Conference on Extending Database Technology (EDBT 2015)

Presentation of "CubeLoad: A Parametric Generator of Realistic OLAP Workloads" [35]
26th International Conference on Advanced Information Systems Engineering (CAiSE 2014)

Presentation of "Meta-Stars: Multidimensional Modeling for Social Business Intelligence" [36]
16th International Workshop on Data warehousing and OLAP (DOLAP 2013)

Invited talks

Data Analytics: from data warehouses to modern data platforms
Lecture for the Science and Technology for the Information Society Bachelor's Degree at Scuola Superiore dell'Università di Genova (IANUA), Genova (GE), 2022

NoSQL Databases
Seminar for the Database Systems course, Master's Degree in Digital Transformation Management, Cesena (FC), 2021

An Introduction to MongoDB
Seminar for the Web Services and Applications course, Master's Degree in Computer Science and Engineering, Cesena (FC), 2021

An Introduction to MongoDB
Seminar for the Web Services and Applications course, Master's Degree in Computer Science and Engineering, Cesena (FC), 2020

An Introduction to Big Data
Workshop "SKA data challenges", Bologna (BO), 2019

Exploratory OLAP on Big Data
Seminar for the "Business Intelligence" course of the PhD program in Computer Science and Engineering, Bologna (BO), 2017

The city's mood between social network and big data
Demonstration at the Modern Art Museum of Bologna (MAMbo), Bologna (BO), 2016

Publications

Publications in International Journals, ordered by time

[1] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, "Self-adaptive analytical querying over schemaless data streams," *J. Big Data*, vol. 12, no. 1, p. 211, 2025. [Online]. Available: https://doi.org/10.1186/s40537-025-01251-1

[2] S. Rizzi, M. Francia, E. Gallinucci, and M. Golfarelli, "Conceptual design of multidimensional cubes with llms: An investigation," *Data Knowl. Eng.*, vol. 159, p. 102452, 2025. [Online]. Available: https://doi.org/10.1016/j.datak.2025.102452

[3] M. Francia, E. Gallinucci, and M. Golfarelli, "Automating materiality assessment with a data-driven document-based approach," *Int. J. Inf. Manag. Data Insights*, vol. 5, no. 1, p. 100310, 2025. [Online]. Available: https://doi.org/10.1016/j.jjimei.2024.100310

[4] M. Francia, E. Gallinucci, M. Golfarelli, and S. Rizzi, "VOOL: A modular insight-based framework for vocalizing OLAP sessions," *Inf. Syst.*, vol. 129, p. 102496, 2025. [Online]. Available: https://doi.org/10.1016/j.is.2024.102496

[5] M. Francia, E. Gallinucci, and M. Golfarelli, "Colossal trajectory mining: A unifying approach to mine behavioral mobility patterns," *Expert Systems with Applications*, vol. 238, 2024. [Online]. Available: https://doi.org/10.1016/j.eswa.2023.122055

[6] S. Bimonte, E. Gallinucci, P. Marcel, and S. Rizzi, "Logical design of multi-model data warehouses," *Knowl. Inf. Syst.*, vol. 65, no. 3, pp. 1067–1103, 2023. [Online]. Available: https://doi.org/10.1007/s10115-022-01788-0

[7] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, "Cost-based optimization of multistore query plans," *Information Systems Frontriers*, 2022, IF: 5.261. [Online]. Available: https://doi.org/10.1007/s10796-022-10320-2

[8] M. Francia, E. Gallinucci, M. Golfarelli, A. Leoni, S. Rizzi, and N. Santolini, "Making data platforms smarter with MOSES," *Future Generation Computer Systems*, vol. 125, pp. 299–313, 2021, IF: 7.187. [Online]. Available: https://doi.org/10.1016/j.future.2021.06.031

[9] C. Forresi, E. Gallinucci, M. Golfarelli, and H. Hamadou, "A dataspace-based framework for OLAP analyses in a high-variety multistore," *VLDB Journal*, 2021, IF: 2.868. [Online]. Available: https://doi.org/10.1007/s00778-021-00682-5

[10] M. Francia, E. Gallinucci, and M. Golfarelli, "COOL: A framework for conversational OLAP," *Information Systems*, p. 101752, 2021, IF: 2.466. [Online]. Available: https://doi.org/10.1016/j.is.2021.101752

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[13] E. Gallinucci, M. Golfarelli, and S. Rizzi, "Mo.re.farming: A hybrid architecture for tactical and strategic precision agriculture," *Data Knowl. Eng.*, vol. 129, p. 101836, 2020, IF: 1.583. [Online]. Available: https://doi.org/10.1016/j.datak.2020.101836

[14] ——, "Approximate OLAP of document-oriented databases: A variety-aware approach," *Inf. Syst.*, vol. 85, pp. 114–130, 2019, IF: 2.066. [Online]. Available: https://doi.org/10.1016/j.is.2019.02.004

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Publications in International Conferences, ordered by time

[20] E. Gallinucci, M. Golfarelli, W. Radwan, G. Zarate, and A. Abelló, "Impact study of nosql refactoring in skyserver database," in *Proceedings of the 27th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2025) co-located with the 28th International Conference on Extending Database Technology and the 28th International Conference on Database Theory (EDBT/ICDT 2025), Barcelona, Spain, March 25, 2025*, ser. CEUR Workshop Proceedings, A. Maté and M. Lissandrini, Eds., vol. 3931. CEUR-WS.org, 2025, pp. 1–11. [Online]. Available: https://ceur-ws.org/Vol-3931/paper1.pdf

[21] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, "ASSO: the automated schemaless stream overseer," in *Proceedings 28th International Conference on Extending Database Technology, EDBT 2025, Barcelona, Spain, March 25-28, 2025*, A. Simitsis, B. Kemme, A. Queralt, O. Romero, and P. Jovanovic, Eds. OpenProceedings.org, 2025, pp. 1078–1081. [Online]. Available: https://doi.org/10.48786/edbt.2025.93

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Conference, ER 2019, Salvador, Brazil, November 4-7, 2019, Proceedings, ser. Lecture Notes in Computer Science, vol. 11788. Springer, 2019, pp. 189–203. [Online]. Available: https://doi.org/10.1007/978-3-030-33223-5_16

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Publications in National Conferences, ordered by time

[37] C. Forresi, M. Francia, E. Gallinucci, M. Golfarelli, and M. Pasini, "Colossal trajectory mining: Semantic co-movement pattern mining," in *Proceedings of the 32nd Symposium of Advanced Database Systems, Villasimius, Italy, June 23rd to 26th, 2024*, ser. CEUR Workshop Proceedings, M. Atzori, P. Ciaccia, M. Ceci, F. Mandreoli, D. Malerba, M. Sanguinetti, A. Pellicani, and F. Motta, Eds., vol. 3741. CEUR-WS.org, 2024, pp. 131–141. [Online]. Available: https://ceur-ws.org/Vol-3741/paper03.pdf

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Proceedings edited

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Ph.D. Thesis

[48] E. Gallinucci, "Business intelligence on non-conventional data," Ph.D. dissertation, University of Bologna, Italy, 2017. [Online]. Available: http://amsdottorato.unibo.it/7863/

Miscellaneous

Professional Experience

Tinfo S.r.l., Forlì (FC), Italy **2010**
Software developer: back-end and front-end development of an IT management system.

Web Consulting S.r.l., Cesena (FC), Italy **2009**
Software developer: back-end and front-end development of an IT management system.

Skills

Big Data management and analysis:
- Distributed file storage (HDFS, S3, Delta)
- Distributed databases (MongoDB, Cassandra, HBase, ElasticSearch)
- Distributed execution frameworks (Spark, Hive, Impala)
- Ecosystem management (Cloudera CDH)
- System orchestration and administration (Airflow, Oozie, Hue)
- Cloud platforms (AWS, Azure, GCP)

Business Intelligence and Data Mining:
- Conceptual modeling (Indyco)
- Data integration (DBT, Pentaho DI, Talend, Tableau Prep)
- Multidimensional engines (Mondrian)
- OLAP analysis and visualization (Tableau, PowerBI, Apache Superset, Saiku, JPivot)
- Data Mining (Weka)

Database Management Systems:
- Relational DBMSs (Oracle, MySQL, PostgreSQL, Microsoft SQL Server)
- NoSQL DBMSs (MongoDB, Neo4j, Cassandra, Redis, HBase, AgensGraph)
- GIS systems (Oracle Spatial & Graph, PostGIS, GeoSpark)

Computer programming:
- Java, PHP, Scala, Python, R, JavaScript, HTML, CSS, PLSQL
- Object-oriented and functional programming
- Mobile programming (Android)

Software engineering:
- Distributed Version Control Systems (Git)
- Build systems (Gradle, Maven)

Web development:
- Web servers (Apache, Tomcat)
- Content Management Systems (Drupal)
- Responsive frameworks (Bootstrap)
- Charts and maps (D3, OpenLayers)

Operating Systems:
- Linux (CentOS, Debian, Ubuntu)
- Microsoft Windows family

Spoken languages

Italian
- Mother tongue

English
- C1 (understanding); B2 (speaking, writing)

Spanish
- A1 (understanding, speaking, writing)