

# Enrico Gallinucci

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CITIZENSHIP	Italian	
CURRENT PLACEMENT	<b><a href="#">Alma Mater Studiorum Università di Bologna</a></b> <b><a href="#">Department of Computer Science and Engineering, Cesena (FC), Italy</a></b> <ul style="list-style-type: none"><li>• Researcher in Tenure Track (RTT)</li></ul>	
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	<b><a href="#">Scopus</a></b> <ul style="list-style-type: none"><li>• H-index: 12</li><li>• H-index (without self-citations): 10</li><li>• Number of citations: 353</li><li>• Number of citations (without self-citations): 309</li></ul> <b><a href="#">Google Scholar</a></b> <ul style="list-style-type: none"><li>• H-index: 14</li><li>• I10-index: 17</li><li>• Number of citations: 611</li></ul>	
EDUCATION	<b><a href="#">Università di Bologna, Department of Computer Science and Engineering, Cesena (FC), Italy</a></b> <b>Ph.D. in <a href="#">Computer Science and Engineering</a>, May 2017</b> <ul style="list-style-type: none"><li>• Grade: “Ottimo”</li><li>• Thesis title: <i><a href="#">Business Intelligence on Non-Conventional Data</a></i></li><li>• Thesis topic: extending traditional Business Intelligence techniques to store, integrate and analyze non-conventional data.<ul style="list-style-type: none"><li>* Analysis of semantically-enriched semi-/unstructured data in advanced BI systems, with a particular focus on social network content.</li><li>* Enhancement of multidimensional cubes in enterprise data warehouses through the integration of linked data.</li><li>* Definition of schema profiling and analysis techniques over NoSQL database systems in a Big Data context.</li></ul></li><li>• Supervisor: <a href="#">Prof. Stefano Rizzi</a></li><li>• Tutor: <a href="#">Prof. Matteo Golfarelli</a></li><li>• External reviewer: <a href="#">Prof. Robert Wrembel</a></li><li>• External reviewer: <a href="#">Prof. Esteban Zimanyi</a></li><li>• Area of Study: Business Intelligence 2.0</li></ul>	

**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

OTHER EDUCATION [BISS 2014](#)

Bertinoro International Spring School; Bertinoro, Italy

[eBISS 2015](#)

Fifth European Business Intelligence Summer School; Barcelona, Spain

[eBISS 2022](#)

Tenth European Business Intelligence Summer School; Cesena, Italy

[eBISS 2023](#)

Eleventh European Business Intelligence Summer School; Barcelona, Spain

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 2034-06-15**

[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 2033-06-01**

RESEARCH  
CONTRACTS

**RESEARCHER IN TENURE TRACK (RTT)** **2024-02-08** — today  
[Università di Bologna, Department of Computer Science and Engineering](#), 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, Department of Computer Science and Engineering](#), 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, Department of Computer Science and Engineering](#), 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, Department of Computer Science and Engineering](#), 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, Department of Computer Science and Engineering, 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

**PH.D. COURSES (teacher)**

Università di Bologna, Department of Computer Science and Engineering, Cesena (FC), Italy

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

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

Università di Bologna, Department of Computer Science and Engineering, Cesena (FC), Italy

Course name	Degree programme	A.Y.	CFU/ECTS	Hours	CS	ACS	NR
<i>Big Data (Mod. 2)</i>	MD in CSE	2023/24	6	30	–	–	–
<i>Big Data (Mod. 1)</i>	MD in CSE	2023/24	6	20	–	–	–
<i>Big Data (Mod. 2)</i>	MD in CSE	2022/23	6	30	100%	81.2%	12
<i>Big Data (Mod. 1)</i>	MD in CSE	2022/23	6	20	89.3%	81.2%	29
<i>Big Data</i>	MD in CSE	2021/22	6	50	NA*	–	–
<i>Big Data (Mod. 1)</i>	MD in CSE	2020/21	6	40	NA*	–	–
<i>Big Data (Mod. 1)</i>	MD in CSE	2019/20	6	40	NA*	–	–
<i>Big Data (Mod. 1)</i>	MD in CSE	2018/19	6	40	94.7%	79.6%	19
<i>Big Data (Mod. 1)</i>	MD in CSE	2017/18	6	40	83.3%	78.1%	12

**NOTE:** 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, Department of Computer Science and Engineering, Cesena (FC), Italy

Course name	Degree programme	A.Y.	CFU/ECTS	Hours	CS	ACS	NR
<i>Big Data and Cloud Platforms (Mod. 1) (*)</i>	MD in DTM	2023/24	6	20	–	–	–
<i>Programming and Computer Architectures (Mod. 2)</i>	MD in DTM	2023/24	6	36	–	–	–
<i>Business Intelligence (Mod. 2)</i>	MD in CSE	2023/24	6	10	–	–	–
<i>Big Data and Cloud Platforms (Mod. 1) (*)</i>	MD in DTM	2022/23	6	20	89.3%	81.2%	29
<i>Business Intelligence (Mod. 2)</i>	MD in CSE	2022/23	6	10	82.4%	87.1%	17
<i>Business Intelligence (Mod. 2)</i>	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.	Hours
<i>Big Data and Cloud Computing</i>	Big Data Management and Analytics (BDMA)	2022/23	10

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

Università di Bologna, Department of Computer Science and Engineering, Cesena (FC), Italy

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

**MASTER THESIS (supervisor)**

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

- Andrea Yuki Alvisi: *Prediction of Revenue and Expenses through Time-Series Analyses*, 2023
- Sara Amaducci: *Analysis of Opportunities and Challenges in the Buy-Now Pay-Later Business Model for FinTech*, 2023
- Chiara Bertocchi: *Data-Driven Support to Marketing Intelligence and Journey Automation at Technogym*, 2023
- Federica Dell'Orletta: *Design and Development of a Data Mart for the HR Department at Amadori*, 2023

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

- Alex Baiardi, 2023
- Michele Mongardi, 2023

- Angelo Parrinello: *Sviluppo di una Suite di Benchmarking per Framework di Analisi di Stream di Dati*, 2023
- 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, Department of Computer Science and Engineering, Cesena (FC), Italy

- 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, Department of Computer Science and Engineering, 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.

#### COURSES IN 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	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 MASTER EXECUTIVE PROGRAMMES (teacher without course responsibility)**

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

Course name	Executive programme	Year	Hours
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 MASTER EXECUTIVE PROGRAMMES (teaching tutor)**

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

Course name	Master programme	A.Y.	Hours
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
Information Systems	Finance, Control and Auditing	2019/20	6
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

**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

PARTICIPATION IN  
RESEARCH GROUPS

### **Business Intelligence Group**

**March 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**

**October 2014 — January 2015; April 2023 — today**

Collaboration with the Database Technologies and Information Management research group at the Universitat Politècnica de Catalunya led by [Prof. Alberto Abelló](#) and [Prof. Oscar Romero](#). The collaboration first focused on creating innovation in the field of Exploratory Business Intelligence, 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.

### **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,

RESEARCH  
PROJECTS

### **WeLASER**

**2020 — today**

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**

**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.



### **WebPoIEU**

**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	<p><b>Data Assessment and Data Strategy Definition</b> <span style="float: right;"><b>2023</b></span> Commissioned by <a href="#">EasyMarket</a>, Rimini (RN), Italy</p> <p>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.</p>
	<p><b>Data Platform Refinement and Analysis of Cimice.Net Data</b> <span style="float: right;"><b>2022</b></span> Commissioned by <a href="#">Ri.Nova soc. coop.</a>, Cesena (FC), Italy</p> <p>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.</p>
	<p><b>Reduction of the Impact of Brown Spot on Pear Trees</b> <span style="float: right;"><b>2020</b></span> Commissioned by <a href="#">C.R.P.V. soc. coop.</a>, Cesena (FC), Italy</p> <p>Project to analyze datasets of questionnaires collected from farmers in the Emilia-Romagna region to uncover patterns in the spread of the <i>brown spot</i> infection in pear trees.</p>
	<p><b>Processing and Analysis of Business Documents and Social Data</b> <span style="float: right;"><b>2017 – 2019</b></span> Commissioned by <a href="#">RE2N S.r.l.</a>, Cesena (FC), Italy</p> <p>Project to apply the methodologies and techniques developed in the context of Social Business Intelligence to aid the task of <i>materiality assessment</i> through the analysis of the text in business documents and social media content.</p>
	<p><b>Analysis of Social Media Discussions on Vaccines</b> <span style="float: right;"><b>2015 – 2016</b></span> Commissioned by <a href="#">Onit S.r.l.</a>, Cesena (FC), Italy</p> <p>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.</p>
INSTITUTIONAL ROLES	<p><b>President of the <a href="#">Internship Committee</a></b> for the <a href="#">Master's Degree in Digital Transformation Management</a>, University of Bologna - since 2022</p> <p>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 <i>handshake day</i> for sponsor companies to present their internship proposals to students and facilitate the latter in finding appealing and valuable internships.</p>
SERVICE IN INTERNATIONAL JOURNALS	<p><a href="#">Data &amp; Knowledge Engineering</a> (Elsevier) <b>Associate Editor</b> - since 2022</p> <p><a href="#">International Journal of Data Mining, Modelling and Management</a> <b>Editorial Board member</b> - since 2021</p> <p>Information Systems (Elsevier), Special issue on DOLAP 2023: Design, Optimization, Languages and Analytical Processing of Big Data Guest Editor (2023)</p>

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

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)

**Program Chair**

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

**Program Chair**

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

**Program Chair**

26th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2024)

Program Committee member

25th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2023)

Program Committee member

7th International Conference on Big Data Research (ICBDR 2023)

Program Committee member

46th International Conference on Business Intelligence Systems (miproBIS 2023)

Program Committee member

9th International Conference on Human and Social Analytics (HUSO 2023)

Program Committee member

24th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2022)

Program Committee member

11th International Conference on Model and Data Engineering (MEDI 2022)

Program Committee member

24th International Conference on Information Integration and Web Intelligence (iiWAS2022 2022)

Program Committee member

45th International Conference on Business Intelligence Systems (miproBIS 2022)

Program Committee member

23rd International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2021)  
 Program Committee member

10th International Conference on Model and Data Engineering (MEDI 2021)  
 Program Committee member

44th International Conference on Business Intelligence Systems (miproBIS 2021)  
 Program Committee member

43rd International Conference on Business Intelligence Systems (miproBIS 2020)  
 Program Committee member

2nd International Workshop on Qualitative Aspects of User-Centered Analytics (QUACA 2020)  
 Program Committee member

9th International Conference on Model and Data Engineering (MEDI 2019)  
 Program Committee member

42nd International Conference on Business Intelligence Systems (miproBIS 2019)  
 Program Committee member

8th International Conference on Model and Data Engineering (MEDI 2018)  
 Program Committee member

41st International Conference on Business Intelligence Systems (miproBIS 2018)  
 Program Committee member

21st European Conference on Advances in Databases and Information Systems (ADBIS 2017)  
 Program Committee member of the Doctoral Consortium

OTHER SERVICE External Commissioner in the [DEDS Doctoral Colloquium](#), Barcelona (2023)

REVIEWING FOR INTERNATIONAL JOURNALS

[Data & Knowledge Engineering](#), 2014, 2015, 2022, 2023

[Information Systems \(IS\)](#), 2018, 2021, 2023

[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](#), 2019

[Information Systems Frontiers \(ISF\)](#), 2019

[International Journal of Data Warehousing and Mining \(IJDWM\)](#), 2014

INTERNATIONAL CONFERENCES

Participation only  
*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”  
*30th Italian Symposium on Advanced Database Systems (SEBD 2022)*

Presentation of “OLAP Querying of Document Stores in the Presence of Schema Variety”  
*28th Italian Symposium on Advanced Database Systems (SEBD 2020)*

Presentation of “A Hybrid Architecture for Tactical and Strategic Precision Agriculture”  
*21st International Conference on Big Data Analytics and Knowledge Discovery (DaWaK 2019)*

Presentation of “Variety-Aware OLAP of Document-Oriented Databases”  
*20th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP 2018)*

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

Presentation of “Schema Profiling of Document Stores”  
*25th Italian Symposium on Advanced Database Systems (SEBD 2017)*

Presentation of “Social Business Intelligence in Action”  
*28th International Conference on Advanced Information Systems Engineering (CAiSE 2016)*

Presentation of “Towards Exploratory OLAP on Linked Data”  
*24th Italian Symposium on Advanced Database Systems (SEBD 2016)*

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

Presentation of “CubeLoad: A Parametric Generator of Realistic OLAP Workloads”  
*26th International Conference on Advanced Information Systems Engineering (CAiSE 2014)*

Presentation of “Meta-stars: multidimensional modeling for social business intelligence”  
*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

AWARDS	<b>Best Demonstration Award</b> , EDBT 2021, Nicosia, Cyprus
PATENTS	<b>Metodo e Sistema per il Monitoraggio dell’Umidità del Suolo</b> October 18, 2023 - Registration number: 102021000023162
INTERNATIONAL EXPERIENCE	<p><b>Universitat Politècnica de Catalunya</b>, Barcelona, Spain</p> <p><i>Visiting Researcher</i> <span style="float: right;"><b>October 6, 2014 to February 5, 2015</b></span></p> <ul style="list-style-type: none"> <li>• Research on enhancing multidimensional cubes through linked data.</li> <li>• UPC supervisor: <a href="#">Prof. Alberto Abelló</a></li> <li>• UniBo supervisor: <a href="#">Prof. Matteo Golfarelli</a></li> </ul> <p><i>Visiting Researcher</i> <span style="float: right;"><b>April 11, 2023 to August 16, 2023</b></span></p> <ul style="list-style-type: none"> <li>• Initiation of a long-term collaboration on the topic of data modeling design strategies in NoSQL databases.</li> <li>• UPC supervisor: <a href="#">Prof. Alberto Abelló</a></li> <li>• UniBo supervisor: <a href="#">Prof. Matteo Golfarelli</a></li> </ul>
PUBLICATIONS IN INTERNATIONAL JOURNALS, ORDERED BY TIME	<ol style="list-style-type: none"> <li>[1] S. Bimonte, E. Gallinucci, P. Marcel, and S. Rizzi, “Logical design of multi-model data warehouses,” <i>Knowl. Inf. Syst.</i>, vol. 65, no. 3, pp. 1067–1103, 2023. [Online]. Available: <a href="https://doi.org/10.1007/s10115-022-01788-0">https://doi.org/10.1007/s10115-022-01788-0</a></li> <li>[2] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, “Cost-based optimization of multistore query plans,” <i>Information Systems Frontiers</i>, 2022, IF: 5.261. [Online]. Available: <a href="https://doi.org/10.1007/s10796-022-10320-2">https://doi.org/10.1007/s10796-022-10320-2</a></li> <li>[3] M. Francia, E. Gallinucci, M. Golfarelli, A. Leoni, S. Rizzi, and N. Santolini, “Making data platforms smarter with MOSES,” <i>Future Generation Computer Systems</i>, vol. 125, pp. 299–313, 2021, IF: 7.187. [Online]. Available: <a href="https://doi.org/10.1016/j.future.2021.06.031">https://doi.org/10.1016/j.future.2021.06.031</a></li> <li>[4] C. Forresi, E. Gallinucci, M. Golfarelli, and H. Hamadou, “A dataspace-based framework for OLAP analyses in a high-variety multistore,” <i>VLDB Journal</i>, 2021, IF: 2.868. [Online]. Available: <a href="https://doi.org/10.1007/s00778-021-00682-5">https://doi.org/10.1007/s00778-021-00682-5</a></li> <li>[5] M. Francia, E. Gallinucci, and M. Golfarelli, “COOL: A framework for conversational OLAP,” <i>Information Systems</i>, p. 101752, 2021, IF: 2.466. [Online]. Available: <a href="https://doi.org/10.1016/j.is.2021.101752">https://doi.org/10.1016/j.is.2021.101752</a></li> <li>[6] S. Bimonte, E. Gallinucci, P. Marcel, and S. Rizzi, “Data variety, come as you are in multi-model data warehouses,” <i>Information Systems</i>, 2021, IF: 2.466. [Online]. Available: <a href="https://doi.org/10.1016/j.is.2021.101734">https://doi.org/10.1016/j.is.2021.101734</a></li> <li>[7] M. Francia, E. Gallinucci, M. Golfarelli, and N. Santolini, “DART: De-anonymization of personal gazetteers through social trajectories,” <i>Journal of Information Security and Applications</i>, vol. 55, p. 102634, 2020, IF: 2.327. [Online]. Available: <a href="https://doi.org/10.1016/j.jisa.2020.102634">https://doi.org/10.1016/j.jisa.2020.102634</a></li> <li>[8] E. Gallinucci, M. Golfarelli, and S. Rizzi, “Mo.re.farming: A hybrid architecture for tactical and strategic precision agriculture,” <i>Data Knowl. Eng.</i>, vol. 129, p. 101836, 2020, IF: 1.583. [Online]. Available: <a href="https://doi.org/10.1016/j.datak.2020.101836">https://doi.org/10.1016/j.datak.2020.101836</a></li> <li>[9] —, “Approximate OLAP of document-oriented databases: A variety-aware approach,” <i>Inf. Syst.</i>, vol. 85, pp. 114–130, 2019, IF: 2.066. [Online]. Available: <a href="https://doi.org/10.1016/j.is.2019.02.004">https://doi.org/10.1016/j.is.2019.02.004</a></li> <li>[10] M. Francia, E. Gallinucci, and M. Golfarelli, “Social BI to understand the debate on vaccines on the web and social media: unraveling the anti-, free, and pro-vax communities in italy,” <i>Soc. Netw. Anal. Min.</i>, vol. 9, no. 1, pp. 46:1–46:16, 2019. [Online]. Available: <a href="https://doi.org/10.1007/s13278-019-0590-x">https://doi.org/10.1007/s13278-019-0590-x</a></li> </ol>

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- [12] E. Gallinucci, M. Golfarelli, S. Rizzi, A. Abelló, and O. Romero, “Interactive multidimensional modeling of linked data for exploratory OLAP,” *Inf. Syst.*, vol. 77, pp. 86–104, 2018, IF: 2.777. [Online]. Available: <https://doi.org/10.1016/j.is.2018.06.004>
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- [15] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, “Streaming approach to schema profiling,” in *Advances in Databases and Information Systems - 27th European Conference, ADBIS 2023, Barcellona, Spagna, September 4-7, 2023, Proceedings*. Springer, 2023.
- [16] M. Francia, E. Gallinucci, M. Golfarelli, and S. Rizzi, “Insight-based vocalization of OLAP sessions,” in *Advances in Databases and Information Systems - 26th European Conference, ADBIS 2022, Turin, Italy, September 5-8, 2022, Proceedings*, ser. Lecture Notes in Computer Science, S. Chiusano, T. Cerquitelli, and R. Wrembel, Eds., vol. 13389. Springer, 2022, pp. 193–206. [Online]. Available: [https://doi.org/10.1007/978-3-031-15740-0\\_15](https://doi.org/10.1007/978-3-031-15740-0_15)
- [17] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, “Optimizing execution plans in a multistore,” in *Advances in Databases and Information Systems - 25th European Conference, ADBIS 2021, Tartu, Estonia, August 24-26, 2021, Proceedings*, vol. 12843. Springer, 2021, pp. 136–151. [Online]. Available: [https://doi.org/10.1007/978-3-030-82472-3\\_11](https://doi.org/10.1007/978-3-030-82472-3_11)
- [18] M. Francia, E. Gallinucci, and M. Golfarelli, “Conversational OLAP in action,” in *Proceedings of the 24th International Conference on Extending Database Technology, EDBT 2021, Nicosia, Cyprus, March 23 - 26, 2021*. OpenProceedings.org, 2021, pp. 646–649. [Online]. Available: <https://doi.org/10.5441/002/edbt.2021.74>
- [19] —, “Towards conversational OLAP,” in *Proceedings of the 22nd International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data co-located with EDBT/ICDT 2020 Joint Conference, DOLAP@EDBT/ICDT 2020, Copenhagen, Denmark, March 30, 2020*, ser. CEUR Workshop Proceedings, vol. 2572. CEUR-WS.org, 2020, pp. 6–15. [Online]. Available: <http://ceur-ws.org/Vol-2572/paper1.pdf>
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- [21] E. Gallinucci and M. Golfarelli, “Sparktune: tuning spark SQL through query cost modeling,” in *Advances in Database Technology - 22nd International Conference on Extending Database Technology, EDBT 2019, Lisbon, Portugal, March 26-29, 2019*. OpenProceedings.org, 2019, pp. 546–549. [Online]. Available: <https://doi.org/10.5441/002/edbt.2019.52>

- [22] H. B. Hamadou, E. Gallinucci, and M. Golfarelli, “Answering GPSJ queries in a polystore: A dataspace-based approach,” in *Conceptual Modeling - 38th International 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](https://doi.org/10.1007/978-3-030-33223-5_16)
- [23] M. Francia, E. Gallinucci, and F. Vitali, “Map-matching on big data: a distributed and efficient algorithm with a hidden markov model,” in *42nd International Convention on Information and Communication Technology, Electronics and Microelectronics, MIPRO 2019, Opatija, Croatia, May 20-24, 2019*. IEEE, 2019, pp. 1238–1243. [Online]. Available: <https://doi.org/10.23919/MIPRO.2019.8757119>
- [24] E. Gallinucci, M. Golfarelli, and S. Rizzi, “Variety-aware OLAP of document-oriented databases,” in *Proceedings of the 20th International Workshop on Design, Optimization, Languages and Analytical Processing of Big Data co-located with 10th EDBT/ICDT Joint Conference (EDBT/ICDT 2018), Vienna, Austria, March 26-29, 2018*, ser. CEUR Workshop Proceedings, vol. 2062. CEUR-WS.org, 2018. [Online]. Available: <http://ceur-ws.org/Vol-2062/paper02.pdf>
- [25] S. Castano, A. Ferrara, E. Gallinucci, M. Golfarelli, S. Montanelli, L. Mosca, S. Rizzi, and C. Vaccari, “SABINE: A multi-purpose dataset of semantically-annotated social content,” in *The Semantic Web - ISWC 2018 - 17th International Semantic Web Conference, Monterey, CA, USA, October 8-12, 2018, Proceedings, Part II*, ser. Lecture Notes in Computer Science, vol. 11137. Springer, 2018, pp. 70–85. [Online]. Available: [https://doi.org/10.1007/978-3-030-00668-6\\_5](https://doi.org/10.1007/978-3-030-00668-6_5)
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- [27] E. Gallinucci, M. Golfarelli, and S. Rizzi, “Meta-stars: Dynamic, schemaless, and semantically-rich topic hierarchies in social BI,” in *Proceedings of the 18th International Conference on Extending Database Technology, EDBT 2015, Brussels, Belgium, March 23-27, 2015*. OpenProceedings.org, 2015, pp. 529–532. [Online]. Available: <https://doi.org/10.5441/002/edbt.2015.50>
- [28] S. Rizzi and E. Gallinucci, “Cubeload: A parametric generator of realistic OLAP workloads,” in *Advanced Information Systems Engineering - 26th International Conference, CAiSE 2014, Thessaloniki, Greece, June 16-20, 2014. Proceedings*, ser. Lecture Notes in Computer Science, vol. 8484. Springer, 2014, pp. 610–624. [Online]. Available: [https://doi.org/10.1007/978-3-319-07881-6\\_41](https://doi.org/10.1007/978-3-319-07881-6_41)
- [29] E. Gallinucci, M. Golfarelli, and S. Rizzi, “Meta-stars: multidimensional modeling for social business intelligence,” in *Proceedings of the sixteenth international workshop on Data warehousing and OLAP, DOLAP 2013, San Francisco, CA, USA, October 28, 2013*. ACM, 2013, pp. 11–18. [Online]. Available: <https://doi.org/10.1145/2513190.2513195>

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CONFERENCES  
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- [30] C. Forresi, M. Francia, E. Gallinucci, and M. Golfarelli, “On the optimization of query plans in multistores,” in *Proceedings of the 31st Italian Symposium on Advanced Database Systems, SEBD 2023, Galzignano Terme (PD), Italy, July 2-5, 2023*, ser. CEUR Workshop Proceedings, vol. TBD. CEUR-WS.org, 2023, pp. 382–391. [Online]. Available: <https://sebd2023.dei.unipd.it/proceedings/paper05.pdf>
- [31] M. Francia, E. Gallinucci, M. Golfarelli, P. Marcel, V. Peralta, and S. Rizzi, “Describing multidimensional data through highlights,” in *Proceedings of the 30th Italian Symposium*



on *Advanced Database Systems, SEBD 2022, Tirrenia (PI), Italy, June 19-22, 2022*, ser. CEUR Workshop Proceedings, vol. 3194. CEUR-WS.org, 2022, pp. 36–43. [Online]. Available: <http://ceur-ws.org/Vol-3194/paper4.pdf>

- [32] M. Francia, E. Gallinucci, and M. Golfarelli, “Conversational OLAP (discussion paper),” in *Proceedings of the 29th Italian Symposium on Advanced Database Systems, SEBD 2021, Pizzo Calabro (VV), Italy, September 5-9, 2021*, ser. CEUR Workshop Proceedings, vol. 2994. CEUR-WS.org, 2021, pp. 403–410. [Online]. Available: <https://ceur-ws.org/Vol-2994/paper45.pdf>
- [33] M. Francia, E. Gallinucci, M. Golfarelli, and S. Rizzi, “OLAP querying of document stores in the presence of schema variety,” in *Proceedings of the 28th Italian Symposium on Advanced Database Systems, Villasimius, Sud Sardegna, Italy (virtual due to Covid-19 pandemic), June 21-24, 2020*, ser. CEUR Workshop Proceedings, vol. 2646. CEUR-WS.org, 2020, pp. 128–135. [Online]. Available: <http://ceur-ws.org/Vol-2646/07-paper.pdf>
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- [35] S. Rizzi, E. Gallinucci, M. Golfarelli, A. Abelló, and O. Romero, “Towards exploratory OLAP on linked data,” in *24th Italian Symposium on Advanced Database Systems, SEBD 2016, Ugento, Lecce, Italy, June 19-22, 2016, Ugento, Lecce, Italia, June 19-22, 2016*. Matematicamente.it, 2016, pp. 86–93.

PH.D. THESIS [36] E. Gallinucci, “Business intelligence on non-conventional data,” Ph.D. dissertation, University of Bologna, Italy, 2017. [Online]. Available: <http://amsdottorato.unibo.it/7863/>

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 systems (HDFS)  
• Distributed databases (MongoDB, Cassandra, HBase, ElasticSearch)  
• Distributed execution frameworks (Spark, Hive, Impala)  
• Ecosystem management (Cloudera CDH)  
• System orchestration and administration (Oozie, Hue)  
• Cloud platform (AWS, Azure, GCP)  
Business Intelligence and Data Mining:  
• Conceptual modeling (Indyco)  
• Data integration (Pentaho DI, Talend, Tableau Prep)  
• Multidimensional engines (Mondrian)  
• OLAP analysis and visualization (Tableau, PowerBI, 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)