

CV - EMANUELE DELLA VALLE

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Education: 2015 – PhD – *On Stream Reasoning* – Faculty of Science, Computer Science, Vrije Universiteit Amsterdam, the Netherlands – promoter Frank van Harmelen

2000 - Master "Laurea in ingegneria informatica" (Computer Science and Engineering)
- Apprendimento per rinforzo in presenza di aliasing percettivo: uno studio sull'uso del registro di memoria (*Reinforcement Learning with perceptual aliasing: a study on the usage of the memory registry*) - Politecnico di Milano, Italy – Mark 97/100

1993 – Maturità Scientifica Liceo Scientifico G. Galilei - Siena, Italy – Mark 60/60

Current Position: 2020-now - *Associate Professor* (Professore Associato), Department of Electronics, Information and Bioengineering of Politecnico di Milano

2023-now – Chief Research Officer (CRO), motus ml s.r.l. S.B., Politecnico di Milano's spin-off

Past Position 2008-2020 - *Assistant Professor* (Ricercatore di Ruolo confermato), Department of Electronics, Information and Bioengineering of Politecnico di Milano

2001-2008 - *Program Manager* of Semantic Web Practice, CEFRIEL, Italy

1. HIGHLIGHTS

1.1. SHORT BIO

Emanuele Della Valle holds a PhD in Computer Science from the Vrije Universiteit Amsterdam and a Master in Computer Science and Engineering from Politecnico di Milano. He has been an associate professor at the [Dpt. of Electronics, Information, and Bioengineering](#) of the [Politecnico di Milano](#) since 2020 and an assistant professor since 2008.

For more than 25 years, Artificial Intelligence has been the common thread of his work: from his Master thesis on reinforcement learning (2000), through knowledge representation and reasoning for the Semantic Web, to learning from data streams. In 2007, he started the [Stream Reasoning](#) research field, positioning it at the intersection between Stream Processing and Artificial Intelligence, and contributed to establishing it as a recognized research and industrial sector through workshops, projects, and journal papers. Building on the inductive side of Stream Reasoning, his research then focused on Streaming Machine Learning and, more recently, on Streaming Continual Learning, which combines rapid adaptation to evolving data streams with the retention of previously acquired knowledge. Along the way, his interests also covered data science, big data, semantic technologies, and web information retrieval. He applied his research to space, manufacturing, IoT, mobile telecom, and social media data in collaboration with Leonardo, Thales Alenia Space, Siemens, Indra, Telecom Italia, Equinor, and IBM.

He is a serial entrepreneur. He co-founded [Fluxedo](#) (2016–2020) to offer crowd analytics based on continuous social media analytics and Edge AI; [Quantia Consulting](#) (2019–) to support organizations in becoming data-driven; and [motus ml](#) (2023–), an academic spin-off of Politecnico di Milano that develops AI solutions for physical systems in the space and manufacturing sectors.

From 2001 to 2008, he worked in [CEFRIEL](#). Between 2001 and 2004, he worked in strategic consultancy IT projects in eBusiness, eGovernment, and eHealth. In 2003, he started the [Semantic Web Practice](#) of CEFRIEL, which he coordinated until 2008.

1.2. QUALITY OF SCIENTIFIC PRODUCTION

PRODUCTIVITY AND IMPACT METRICS

- **Scientific Productivity:** 198 publications (198 entries on Scopus, 370 co-authors according to Scopus):
 - Co-author of **32 journal papers** including **1 Transactions** (TOIT) and **14 top-ranked journals**, **Q1** based on SCIMAGO, (JWS, SWJ, Sigmod Records, Commun. ACM, Data Min. Knowl. Discov., Big Data Research, Data Science, IEEE IS, IEEE MM, Expert Syst. Appl., Inf. Syst., Artif. Intell. Medicine, Neurocomputing, and CMBP);
 - Co-author of **4 books** on [Streaming Linked Data](#) (2023), [Relevant Query Answering over Streaming and Distributed Data](#) (2020), [Web Information Retrieval](#) (2013), and a [book in Italian on the Semantic Web](#) (2009), and of a forthcoming book on *Streaming Artificial Intelligence* (Springer, 2027);
 - Co-author of **56** scientific publications on peer-reviewed **conferences** including **14** top-level **A++/A+ Class 1** conferences according to GII-GRIN-SCIE conf. ranking (including ISWC, and WWW);
 - Co-inventor of **1 granted** patent with Politecnico di Milano.
- **Publication Impact:**

Based on Google Scholar:	h-index 40	citations 6825
Based on Scopus:	h-index 28	citations 3339

SELECTED AWARDS AND RECOGNITIONS

- | | |
|---------|--|
| 9-2026 | motus ml, the academic spin-off he co-founded, wins the Satellite Data Use – Downstream award at <i>BEX – Beyond Exploration Expo 2026</i> |
| 12-2024 | Tenet: Benchmarking Data Stream Classifiers in Presence of Temporal Dependence won IEEE BigData'24 <i>best student paper runner-up award</i> |
| 9-2021 | Chimera: A Bridge Between Big Data Analytics and Semantic Technologies won ISWC'21 <i>best paper award</i> |
| 7-2021 | Supporting an Expert-centric Process of New Product Introduction With Statistical Machine Learning won BIS'21 <i>best paper award</i> |
| 5-2021 | RSP4J: An API for RDF Stream Processing won ESWC'21 <i>best paper award</i> |
| 6-2019 | D2IA: Stream Analytics on User-Defined Event Intervals won CAiSE'19 <i>best paper award</i> |
| 10-2016 | CitySensing: Fusing City Data for Visual Storytelling wins IEEE MM'16 <i>best paper award</i> |
| 9-2013 | <i>IBM Faculty Award 2013</i> for his research program on City Data Fusion |
| 9-2011 | Bottari wins the <i>Semantic Web Challenge 2011</i> |
| 6-2011 | Traffic LarKC wins the <i>AI mashup Challenge 2011</i> |
| 6- 2007 | Enabling the EU Patient Summary Through Triplespaces wins CBMS <i>best paper award</i> |
| 9- 2006 | <i>IBM Faculty Award 2006</i> for Model-Driven Semantic Web Application Developmen |

RESEARCH INTERESTS

- 2022-... *Streaming Continual Learning* (with F. Giannini, A. Cossu, and D. Bacciu): a unifying paradigm that combines Streaming Machine Learning, Continual Learning, and Time Series Analysis to learn from non-stationary data streams with temporal dependence, adapting rapidly to change without forgetting previously acquired knowledge
- 2008-... *Inductive Stream Reasoning*: from the early work with V. Tresp on combining stream reasoning and machine learning (e.g., traffic forecasting and social media analytics) to Streaming Machine Learning (with A. Bifet and H. M. Gomes) and Time Series Analytics, including time-evolving analytics and EdgeAI
- 2008-... *Deductive Stream Reasoning* (with S. Ceri and F. van Harmelen): knowledge representation and reasoning on evolving data streams, Graph Stream Processing, and Complex Event Processing
- 2013-... *Data Science and Engineering at Scale* (with M. Brambilla): systems and methods to process, integrate, and analyse data at scale, from distributed stream processing and complex event recognition to urban data science and the integration of data and knowledge with Large Language Models
- 2001-2014 *Web Information Management* (with S. Ceri and D. Fensel): Web, Information Retrieval, Web Data, Semantic Search, Semantic Web Services, Games with a Purpose

1.3. TECHNOLOGY TRANSFER

STARTUPS AND SPIN-OFFS

- 2023-... He co-founded *motus ml s.r.l. S.B.* – spin-off of *Politecnico di Milano* to exploit the industrial results of his research on Streaming Machine Learning, Streaming Continual Learning, and Time Series Analysis. The company develops AI solutions for satellites and space-grade manufacturing, e.g., on-board processing of satellite data and AI-based quality control of space-grade electronics, for customers such as Leonardo and Thales Alenia Space. In 2025, its turnover was 1.2M€; today, it has a team of 15 people.
- 2019-... He co-founded *Quantia Consulting s.r.l.* to offer strategic consultancy and educational services to organizations willing to become data-driven. In 2024, its turnover was 342K€, and it employs 4 FTE.
- 2016-2020 He co-founded *Fluxedo s.r.l.* to exploit the industrial outcomes of his stream reasoning research. In the 4 years of activities, the company grew to an annual turnover of 400K€ and 5 FTE, offering solutions for cloud-based social media analytics and EdgeAI crowd analytics and working on Big Data consultancy projects for large USA-based companies together with CEFRIEL.

DEVELOPMENT OF PRODUCTS / OPEN-SOURCE TOOLS / APPLICATIONS / SYSTEMS / SERVICES

- 2024-... *CapyMOA* is an open-source Python library for efficient Streaming Machine Learning, led by H. M. Gomes and A. Bifet and increasingly adopted by both the Streaming Machine Learning and the Continual Learning communities. His group is among its most active contributors, extending it towards learning from data streams with temporal dependence and Streaming Continual Learning; together with *Avalanche*, it was one of the two hands-on frameworks of the 1st Streaming Continual Learning Bridge at AAAI 2026.
- 2024-... *Tenet* is the first publicly available benchmark for evaluating data stream classifiers in presence of temporal dependence. It includes a data stream generator that injects temporal dependence into commonly used benchmark streams and a continuous LSTM baseline.
- 2016-... *RSP4J* (formerly *rsplab*) is a second-generation library to build RDF Stream Processing (RSP) Engines according to the RSP-QL's reference model. It is the official repository for the example included in the 2023 book he wrote on Streaming Linked Data
- 2008-2015 *C-SPARQL Engine* was the first RDF stream processor with stream reasoning capabilities. It was downloaded thousands of times and used across several industrial sectors.
- 2006-2008 *Squiggle* was a lightweight semantic search solution. The engine was deployed several times and won the StartCup Milano Lombardia in 2008.

1.4. SELECTED TEACHING ACTIVITIES

POSTGRADUATE PROGRAMS, POLITECNICO DI MILANO, ITALY

Since 2016, he took a leading role in organizing postgraduate programs for Politecnico di Milano in collaboration with CEFRIEL. In 2016, he became the *Scientific Director* of the 3rd edition of the Master's Degree in *Analytics & Business Intelligence*. In 2019, he fully designed as *Scientific Director* the 1st editions of the Master's Degrees in *Big Data Engineering* and in *Big Data Science*. In 2026, he became the *Scientific Director* of the 4th edition of the Master's Degree in *Artificial Intelligence, Data Science and Data Engineering*. In 2025, he became the *Scientific Director* of the 2nd and 3rd editions of the *Postgraduate Course in Artificial Intelligence Project Management*. He has also been teaching in the Master's Degrees in *Cloud Data Engineering* and *AI & Data Engineering* (with BIP

xTech), *Data Science and Artificial Intelligence*, *Data Engineering and Applied Intelligence* (with Nestlé), and *Big Data Science* (3rd ed.).

FOR THE M.SC. IN INFORMATION ENGINEERING, POLITECNICO DI MILANO, ITALY

Since 2021, he has been teaching *Streaming Data Analytics* for Computer Science and Engineering, Mathematical and Physics Engineering, High-Performance Computing Engineering, and Telecommunication Engineering. This course stems from a sequence of innovative courses he started in 2015 with *Interoperability and Semantic Technologies*, which evolved into *Web Science* in 2016 (as a joint work with prof. Marco Brambilla), which in turn became *Unstructured and Streaming Data Engineering* in 2018. Since 2020, he has also been teaching the computer science part of the *Laboratory of Interaction Design* for the School of Design. Since he joined Politecnico di Milano in 2008, he has been teaching healthcare system interoperability (HL7) and Semantic Technologies in the course *ICT for Health Care and Life Science* of prof. M. Masseroli. From 2008 to 2021, he taught *Digital Project Management* (formerly, Planning and Managing Software Project) for Computer Science and Engineering. From 2004 to 2007, he taught *Advanced Topics in Information Systems* for Computer Science and Engineering.

FOR PROFESSIONALS

His offering for professionals mirrors his research trajectory and covers the whole lifecycle of AI systems that operate on live data: engineering data streams (Esper EPL, Kafka, Spark Structured Streaming), learning from them as they evolve (Time Series Analysis and Streaming Machine Learning), and deploying models where data is produced, from Edge AI for the IoT to Computer Vision for anomaly detection and Earth Observation (from CNNs to U-Net and PatchCore). A recent focus is adapting Large Language Models without retraining them from scratch (fine-tuning, LoRA adapters for multi-head LLMs, quantization, and local deployment), bringing the lessons of Continual Learning to generative AI. For managers, he teaches AI Project Management, i.e., how to scope, run, and evaluate AI initiatives, both in the dedicated Postgraduate Course and in corporate programs. Many of these classes were co-designed with companies such as Allianz, Nestlé, BIP xTech, and Sorgenia, and are usually delivered through Cefriel, POLIMI Graduate School of Management, and Quantia Consulting. Outside formal academic programs, he trains at least 100 professionals per year.

FOR PHD SCHOOL, POLITECNICO DI MILANO, ITALY (BI-ANNUAL COURSES)

From 2012 to 2020, he organized and lectured two PhD courses: *Stream and Complex Event Processing* (3 editions) and *A Multidisciplinary view on Big Data* (3 editions). He was also lecturing in 3 editions of the PhD course on *Integration And Computational Analysis Of Genomic And Proteomic Information*.

SUPERVISION OF GRADUATE AND PHD STUDENTS

Since 2008, he advised 7 PhD Students in the PhD School of Politecnico di Milano. D. Dell’Aglio, who won the IBM PhD Fellowship award 2014/15, is an associate professor at the Aalborg University. Riccardo Tommasini is an associate professor at INSA Lyon. Three other students hold CxO positions in innovative startups and academic spin-offs: M. Balduini is CEO of Quantia Consulting, while G. Ziffer and A. Bernardo are, respectively, CEO and CTO of motus ml. From 2016 to 2020, he also co-advised a PhD student for the PhD School in Information and Communication Technology of the University of Trento. Since 2008, he has advised 90+ Master students of the School of Industrial and Information Engineering of Politecnico di Milano. While he was working in CEFRIEL (2006-08) he co-advised other 3 master students.

1.5. ORGANISATION OF SCIENTIFIC MEETINGS

He was the general chair of DEBS’21. He was Track Chair for the Extended Semantic Web Conference series (5 times between 2011 and 2021). In 2019, he was a senior program committee member of the International Semantic Web Conference series. Since 2009, he has been chairing the Stream Reasoning workshop series (10 editions under the titles Stream Reasoning, Ordering and Reasoning, and Web Stream Processing). Since 2025, he has been co-organizing events on Streaming Continual Learning: a special session at ESANN 2025 and the 1st Streaming Continual Learning Bridge at AAAI 2026.

1.6. INSTITUTIONAL RESPONSIBILITIES

2026-	Scientific Director – Master in Big Data Science (4 th ed.), Politecnico di Milano
2026–2027	Scientific Director – Postgraduate Course in Artificial Intelligence Project Management (3 rd ed.), Politecnico di Milano
2025–2026	Scientific Director – Postgraduate Course in Artificial Intelligence Project Management (2 nd ed.), Politecnico di Milano
2021–2022	Scientific Director – Master in Big Data Science (2 nd ed.), Politecnico di Milano
2020–2021	Scientific Director – Master in Big Data Science (1 st ed.), Politecnico di Milano
2019–2020	Scientific Director – Master in Big Data Engineering (1 st ed.), Politecnico di Milano
2016–2018	Scientific Director – Master in Analytics & Business Intelligence (3 rd ed.), Politecnico di Milano
2008–	Member of the Internationalization Committee, Politecnico di Milano

1.7. COMMISSIONS OF TRUST

He is *Area Editor* of the Transactions on Graph Data and Knowledge (TGDK) since 2023 and of the Journal of Web Semantics since 2014. He regularly acts as a referee for several international journals, including ACM (TOIT, TWeb, Sigmod Records & Trans Syst Man Cybern Syst), IEEE (IC, IS & TSE, Elsevier JWS, Eng Appl Artif Intell., DKE, & JMAT), Springer (KAIS), IOS press (SWJ), and IGI Global (IJSWIS). He is also a stable member of the Program Committee of WWW, ISWC, ESWC, ICWE, EKAW, and DEBS.

1.8. MAJOR COLLABORATIONS

- 2023- Prof. Davide Bacciu and Dr. Andrea Cossu, Continual Learning, University of Pisa, Italy - this active collaboration on Streaming Continual Learning started in 2023 and led to the ESANN 2025 special session and a joint journal article in Neurocomputing.
- 2017- Prof. Albert Bifet, Streaming Machine Learning, Télécom Paris, France, and University of Waikato, New Zealand - one of the leading figures of Streaming Machine Learning; this active collaboration started in 2017 at the Dagstuhl Seminar 17441 on Big Stream Processing Systems.
- 2012- Prof. Ian Horrocks, Stream Reasoning - this collaboration started in 2012 when they started collaborating in preparing several EU proposals. They jointly published 1 journal paper.
- 2003- Prof. Stefano Ceri, Stream Reasoning, Politecnico di Milano, Italy - this is the longest of the active collaborations. It started in 2003 when he selected prof. S. Ceri as Scientific Director for a EU project he won for CEFRIEL. It was at a maximum between 2007 and 2013, when they called the AI and Stream processing communities to work on Stream Reasoning. In that period, they published 7 journal articles and 5 conference papers.
- 2007-2017 Prof. Frank van Harmelen, Stream Reasoning, Vrije Universiteit Amsterdam, The Netherlands - this long-lasting collaboration started in 2007 in writing the proposal of the LarKC EU project. Prof. van Harmelen was his PhD advisor. They jointly published 2 journals.
- 2008-2014 Prof. Volker Tresp, Machine Learning, Ludwig Maximilian University of Munich & SIEMENS Munich, Germany - this long-lasting collaboration started in 2008 in the LarKC EU project and led to the joint publication of 4 journal articles.
- 2013-2020 Prof. Oscar Corcho, Stream Reasoning, Universidad Politecnica de Madrid, Spain – this long-lasting collaboration on Stream Reasoning started in 2013, and since then, they exchanged several students.
- 2012-2017 Abraham Bernstein, Stream Reasoning, this active collaboration started in 2012. They jointly published 4 conference papers and a journal article.

1.9. COMPETITIVE FUNDING

He was awarded funds for more than a decade. Overall he raised 4.3M€ for the organizations he worked for. 1M€ with the EIT Digital activities on data-driven innovation; 3M€ with the EU projects (SEEMP, TripCom, SUPER, and LarKC); and around 300K€ with the National funded project NeP4B. More recently, while focusing on his two industrial initiatives, he secured funding for industrial PhD scholarships: two co-funded by Thales Alenia Space and PNRR (A. De Santis and L. Iovine) and one TEF scholarship (M. M. Declich).

1.10. SELECTED PUBLICATIONS

TOP JOURNAL ARTICLES

- [j3] E. Della Valle, S. Ceri, F. van Harmelen, D. Fensel: It's a Streaming World! Reasoning upon Rapidly Changing Information. IEEE Intelligent Systems 24(6): 83-89 (2009)
- [j6] D. F. Barbieri, D. Braga, S. Ceri, E. Della Valle, M. Grossniklaus: Querying RDF streams with C-SPARQL. SIGMOD Record 39(1): 20-26 (2010)
- [j9] D. F. Barbieri, D. Braga, S. Ceri, E. Della Valle, Yi Huang, V. Tresp, A. Rettinger, H. Wermser: Deductive and Inductive Stream Reasoning for Semantic Social Media Analytics. IEEE Intelligent Systems 25(6): 32-41 (2010)
- [j17] M. Balduini, E. Della Valle, M. Azzi, R. Larcher, F. Antonelli, P. Ciuccarelli: CitySensing: Fusing City Data for Visual Storytelling. IEEE MultiMedia 22(3): 44-53 (2015) **BEST PAPER AWARD**
- [j19] D. Dell'Aglio, E. Della Valle, F. van Harmelen and A. Bernstein: Stream reasoning: A survey and outlook. Data Sci. 1(1-2): 59-83 (2017)
- [j31] Andrea Cossu, Federico Giannini, Giacomo Ziffer, Alessio Bernardo, Alexander Gepperth, Emanuele Della Valle, Barbara Hammer, Davide Bacciu: A practical guide to streaming continual learning. Neurocomputing 674: 132951 (2026)
- [j32] Federico Giannini, Giacomo Ziffer, Emanuele Della Valle: Dynamic continuous progressive neural networks for evolving streaming time series. Data Min. Knowl. Discov. 40(4): 49 (2026)

OTHER SELECTED JOURNAL ARTICLES

- [j1] M. Brambilla, S. Ceri, F. M. Facca, I. Celino, D. Cerizza, E. Della Valle: Model-driven design and development of semantic Web service applications. *ACM Trans. Internet Techn.* 8(1) (2007)
- [j11] M. Balduini, I. Celino, D. Dell'Aglio, E. Della Valle, Yi Huang, T. Lee, S.-H. Kim, V. Tresp: BOTTARI: An augmented reality mobile application to deliver personalized and location-based recommendations by continuous analysis of social media streams. *J. Web Sem.* 16: 33-41 (2012) **WINNER OF SEMANTIC WEB CHALLENGE**
- [j16] D. Dell'Aglio, E. Della Valle, J.-P. Calbimonte, Ó. Corcho: RSP-QL Semantics: a Unifying Query Model to Explain Heterogeneity of RDF Stream Processing Systems. *Int. J. Semantic Web Inf. Syst.* 10(4): 17-44 (2014)
- [j24] Alessio Bernardo, Emanuele Della Valle: VFC-SMOTE: very fast continuous synthetic minority oversampling for evolving data streams. *Data Min. Knowl. Discov.* 35(6): 2679-2713 (2021)

SELECTED CONFERENCE PAPERS

- [c5] M. Brambilla, I. Celino, S. Ceri, D. Cerizza, E. Della Valle, F. Michele Facca: A Software Engineering Approach to Design and Development of Semantic Web Service Applications. *International Semantic Web Conference 2006*: 172-186
- [c22] E. Della Valle, S. Ceri, D. F. Barbieri, D. Braga, A. Campi: A First Step Towards Stream Reasoning. *FIS 2008*: 72-81
- [c28] D. F. Barbieri, D. Braga, S. Ceri, E. Della Valle, M. Grossniklaus: C-SPARQL: SPARQL for continuous querying. *WWW 2009*: 1061-1062
- [c41] D. F. Barbieri, D. Braga, S. Ceri, E. Della Valle, M. Grossniklaus: Incremental Reasoning on Streams and Rich Background Knowledge. *ESWC (1) 2010*: 1-15
- [c50] S. Magliacane, A. Bozzon, E. Della Valle: Efficient Execution of Top-K SPARQL Queries. *International Semantic Web Conference (1) 2012*: 344-360
- [c55] M. Balduini, E. Della Valle, D. Dell'Aglio, M. Tsytsarau, T. Palpanas, C. Confalonieri: Social Listening of City Scale Events Using the Streaming Linked Data Framework. *International Semantic Web Conference (2) 2013*: 1-16
- [c112] Alessio Bernardo, Heitor Murilo Gomes, Jacob Montiel, Bernhard Pfahringer, Albert Bifet, Emanuele Della Valle: C-SMOTE: Continuous Synthetic Minority Oversampling for Evolving Data Streams. *IEEE BigData 2020*: 483-492
- [c131] Giacomo Ziffer, Federico Giannini, Emanuele Della Valle: Tenet: Benchmarking Data Stream Classifiers in Presence of Temporal Dependence. *IEEE BigData 2024*: 1187-1196

2. MAIN RESEARCH ACCOMPLISHMENTS AND FUTURE GOALS

2.1. FROM STREAMING MACHINE LEARNING TO STREAMING CONTINUAL LEARNING

His work on the inductive side of Stream Reasoning, i.e., learning from data streams whose distribution evolves over time, started in 2008 with V. Tresp in the LarKC project, by combining deductive stream reasoning and machine learning to forecast urban traffic [j10] and to analyse social media streams [j9,j14]. Since 2019, he has focused on Streaming Machine Learning. A first line of research, carried out with A. Bernardo and in collaboration with A. Bifet and H. M. Gomes, addressed continuous rebalancing of imbalanced evolving streams. It produced C-SMOTE and its successors [c107,c112,c120,j24,j27], the IEBench benchmark [c115], and a study on when to learn from evolving streams [c124].

A second line, with G. Ziffer, showed that the i.i.d. assumption behind most Streaming Machine Learning (SML) methods does not hold when data streams exhibit temporal dependence. It proposed Kalman-based learners that adapt quickly to change [c106,c119] and laid the foundations of time-evolving analytics [j28]. It also produced Tenet [c131], the first public benchmark for data stream classifiers under temporal dependence, which received the best student paper runner-up award at IEEE BigData 2024.

Building on these results, with F. Giannini he started investigating how to adapt to change without forgetting previously acquired knowledge. This led to continuous progressive neural networks [c123,j32] and to architectures for learning under temporal dependence, concept drift, and forgetting [c129,c132,c135,c139]. Together with A. Cossu, D. Bacciu, B. Hammer, and A. Gepperth, this work converged into *Streaming Continual Learning* (SCL), a unifying paradigm that combines the rapid adaptation of SML, the knowledge retention of Continual Learning, and the temporal modelling of Time Series Analysis [c138,j31]. To grow the community around it, he co-organized a special session at ESANN 2025 and the first Streaming Continual Learning Bridge at AAAI 2026 [e10].

The same techniques are being applied to Earth Observation and space systems [c134,c137,c140], energy [c133], and resource-constrained devices [c136]. Through motus ml, they are deployed in the space and manufacturing sectors.

Future goals. His current research question is how to build learners that adapt in real time to evolving, temporally dependent data streams without forgetting, and with guarantees on adaptation time [c140]. He also aims to scale these learners up to foundation models, e.g., multimodal Earth Observation models, and down to on-board and edge devices.

2.2. STREAM REASONING: TAMING VELOCITY AND VARIETY OF BIG DATA SIMULTANEOUSLY

More and more applications require real-time processing of data streams in oil&gas operations, in weather monitoring, in customer relationship management, in Smart Cities and in Social Media Analytics. For instance, in the last two domains, is public transportation where the people are? Who is driving the discussion about the top 10 emerging topics across all the social networks?

A system able to answer those queries must:

1. handle *massive datasets*,
2. process *data streams* on the fly,
3. cope with *heterogeneous, incomplete and noisy* data,
4. provide *reactive answers*,
5. support *fine-grained information access*, and
6. integrate *complex domain models*.

Indeed, systems capable of taming the velocity dimension of Big Data exist. They can provide reactive fine-grained information access and analysis even in the presence of noisy data streams. Similarly, recent research on Data Integration and Semantic technologies – in particular on scalable Ontology Based Data Access (OBDA) – can tame the variety dimension of Big Data. OBDA can offer fine-grained information access to heterogeneous and incomplete datasets by reasoning on complex domain models so to rewrite ontological queries in SQL. However, none of those solutions can tame velocity and variety simultaneously especially when the information need is a complex data analysis.

In 2008, he, Stefano Ceri, Frank van Harmelen and Dieter Fensel identified this challenge and formulate the Stream Reasoning research question [j3]:

is it possible to make sense in real time of multiple, heterogeneous, gigantic and inevitably noisy and incomplete data streams in order to support the decision process of extremely large numbers of concurrent users?

In ten years of research in Stream Reasoning [j19], he conducted investigations and wrote papers that envision, elaborate, evaluate and discuss many aspects of this research question. His papers, together with the Stream Reasoning community, document that *a)* the Semantic Web stack can be extended so to incorporate streaming data and events as a first class objects [j6,j8,j12,j16,c77,c91,c96], *b)* the Stream Reasoning task is feasible [j11,j14,j21,c97,c101], *c)* the very nature of streaming data offers opportunities to optimize reasoning tasks [c41,

p8,j13], *d*) a combination of deductive and inductive stream reasoning¹ techniques can cope with incomplete and noisy data [j9,j14,j15]. In addition to the publications, he exploited some of the mature solutions in real scenarios [j11,j15,j17,j22].

Getting inspired by such results, he sees them as the foundations to build new research and reach the ambition goal set in 2008 [j3].

2.3. DATA SCIENCE AT SCALE

In the 2010s, torrents of data started capturing the digital reflexes of reality and tracking their changes with minimal delay. Indeed, it became possible to feel the pulse of cities, industrial plant, and smart grids (just to name few examples) by fusing in real-time all those torrents of data using Big Data technologies (in particular stream processing [j18,j20,c68,c72,c90,c100]), and Data Science methods [j22].

Moreover, scalable advance data analytics techniques can be used to make sense of such a pulse and deliver innovative services such as:

- telling stories about City Scale Events [j17] (e.g., EXPO 2015 or Milan Design and Fashion weeks) fusing Mobile Telecom and Social Media Data (joint work with Telecom Italia)
- predicting traffic based not only on the traffic sensors, but also on the weather conditions and the events happening in the city [j10] (joint work with SIEMENS); and
- recommending venue using continuous analysis of social media streams [j11,j14,j15,c55] (joint work with Saltlux, SIEMENS and TU Delft).

With those studies, he won the AI mashup challenge 2011, the Semantic Web challenge 2011 and the AI mashup challenge 2013. With his research program on City Data Fusion, he won the IBM Faculty award 2013. The story telling solution [j17], which was displayed for the entire duration of EXPO Milano 2015 in EXPO Gate and on 11 view walls in the EXPO Area, won the best paper award of IEEE Multi-Media.

2.4. WEB INFORMATION MANAGEMENT

The diffusion of the World Wide Web boosted at the turn of the century research on information retrieval. Big players such as Google and Yahoo! were the primary contributors of a technology for fast access to Web information [c30]. Searching capabilities are now integrated in most information systems, ranging from business management software and customer relationship systems to social networks and mobile phone applications. His major interest within this field is in Web Data Publishing and Semantic Search. His major contribution to the field are Squiggle [c4,c6,c10] – a framework for deploying domain specific Semantic Search engines –, SOIP [c1,c3,c32,c34] – a flexible frameworks for Information Portal powered by Semantic Technologies – and the experimental usage of Triple Space (a platform for distribute publishing of RDF) for sharing Patient Summaries [j4,c7,c9,c18]. He also contributed the Search Computing project lead by prof. Stefano Ceri [j7,c30,c31,c37,c38,c39,c40]. In 2013, he was co-author a book on Web Information Retrieval [b3]. His current and future work in this area is on how to automatically add to knowledge graphs entities in the long tail (e.g., emerging fashion designers or temporary stores) by continuously analyse social media [c79].

2.5. GAME WITH A PURPOSE

In the beginning of the 2010s', crowdsourcing and human computation became a major topics in computer Science. He investigated the application of those topics to Semantic technologies design, coordinating the development and evaluating two Games with a Purpose (GWAP): UrbanMatch that addresses the record linkage problem [c48,c51] and Urbanopoly that collects and validates urban linked data [c49]. The results lead to the development of an open source framework for image-centric GWAPs (namely Get The Picture) that was positively used by organization independent from Politecnico di Milano to develop real-world services, e.g., IndoMilando and Pic Mi App.

2.6. SEMANTIC WEB SERVICES

In the early 2000s, one of the most challenging promises of the Web Services was to enable the construction of flexible business applications, spanning over several enterprises and capable of dynamic composition for presenting to their clients the “best” business options. In his attempts to realize those promises, he participated to the investigations on Semantic Web Services, i.e., the attempt to augment Web Services with semantic annotations and to operate reasoners on top of such descriptions for performing business choices, thus matching user's goals to system's resources. He worked on this topic under the supervision of prof. Stefano Ceri. His major contributions are Glue, a mediator based Web Service Discovery Engine [c2,c25,p2,p6], and SWE-ET [j1,c5], a model-driven approach to Design and Development of Semantic Web Service Applications. With this framework he won the IBM faculty award 2006.

¹ Inductive stream reasoning is also known as streaming machine learning.

3. EDUCATION ACTIVITIES

3.1. SCIENTIFIC DIRECTOR OF POSTGRADUATE PROGRAMS

- [2026/...] Scientific Director of the “Master in Artificial Intelligence, Data Science and Data Engineering (4th ed.)” of Politecnico di Milano
- [2026/2027] Scientific Director of the “Postgraduate Course in Artificial Intelligence Project Management (3rd ed.)” of Politecnico di Milano
- [2025/2026] Scientific Director of the “Postgraduate Course in Artificial Intelligence Project Management (2nd ed.)” of Politecnico di Milano
- [2021/2022] Scientific Director of the “Master in Big Data Science (2nd ed.)” of Politecnico di Milano
- [2020/2021] Scientific Director of the “Master in Big Data Science (1st ed.)” of Politecnico di Milano
- [2019/2020] Scientific Director of the “Master in Big Data Engineering (1st ed.)” of Politecnico di Milano
- [2016/2018] Scientific Director of the “Master in Analytics & Business Intelligence (3rd ed.)” of Politecnico di Milano

3.2. TEACHING PHD COURSES

- [2018/2019] *A Transdisciplinary view on Big Data* - Politecnico di Milano, PhD School (joint work with prof. Danilo Ardagna (DEIB), prof. Michela Arnaboldi (DIG), prof. M. Brambilla (DEIB), prof. Paolo Ciuccarelli (DESIGN), Valeria Fedeli (DASTU), Fabio Pammolli (DIG), Piercesare Secchi (DMAT) and prof. Simone Vantini (DMAT))
- [2018/2019] *Stream and Complex Event Processing* - Politecnico di Milano, PhD School (joint work with prof. Gianpaolo Cugola (DEIB) and prof. Alessandro Margara (DEIB))
- [2017/2018] *Integration And Computational Analysis Of Genomic And Proteomic Information* - Politecnico di Milano, PhD School (joint with prof. M. Masseroli and prof. Matteo Matteucci)
- [2016/2017] *A Multidisciplinary view on Big Data* - Politecnico di Milano, PhD School (joint work with prof. Danilo Ardagna (DEIB), prof. Michela Arnaboldi (DIG), prof. Paolo Ciuccarelli (DESIGN), and prof. Simone Vantini (MAT))
- [2015/2016] *Integration And Computational Analysis Of Genomic And Proteomic Information* - Politecnico di Milano, PhD School (joint with prof. M. Masseroli and prof. Matteo Matteucci)
- [2014/2015] *A Multidisciplinary view on Big Data* - Politecnico di Milano, PhD School (joint work with prof. Danilo Ardagna, prof. Cinzia Cappiello, prof. Paolo Ciuccarelli, prof. Paolo Cremonesi, prof. Elisabetta Di Nitto, and prof. Letizia Tanca)
- [2012/2015] *Stream and Complex Event Processing* - Politecnico di Milano, PhD School (joint work with prof. Gianpaolo Cugola)
- [2013/2014] *Integration And Computational Analysis Of Genomic And Proteomic Information* - Politecnico di Milano, PhD School (joint work with prof. M. Masseroli and prof. Matteo Matteucci)

3.3. TEACHING MSc AND BSc COURSES

- [2026/...] *Advanced Geospatial Artificial Intelligence* (AI part) - Politecnico di Milano, joint work with V. Yordanov (GEO part)
- [2021/...] *Streaming Data Analytics* ~200 students - Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering
- [2020/...] *Interaction Design Laboratory* ~50 students - Politecnico di Milano, School of Design, Master of Science in Communication Design
- [2018/2021] *Unstructured and Streaming Data Engineering* ~45 students - Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering (former V Facoltà di Ingegneria, Laurea in Ingegneria Informatica) joint work with prof. M. Brambilla.
- [2008/2021] *Digital Project Management* (formerly, Planning and Managing Software Project) ~100 students - Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering (former V Facoltà di Ingegneria, Laurea in Ingegneria Informatica)
- [2016/2018] *Web Science* ~45 students – Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering (former V Facoltà di Ingegneria, Laurea in Ingegneria Informatica) joint work with prof. M. Brambilla.
- [2015/2016] *Interoperability and Semantic Technologies* ~50 students – Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering (former V Facoltà di Ingegneria, Laurea in Ingegneria Informatica)

- [2006/2009] *Ingegneria della Conoscenza* ~30 students - Università degli Studi dell'Insubria, Laurea Specialistica in Scienze e Tecniche della Comunicazione, Facoltà di Scienze Matematiche, Fisiche e Naturali
- [2004/2007] *Argomenti Avanzati di Sistemi Informativi A* ~40 students – Politecnico di Milano, V Facoltà di Ingegneria, Laurea in Ingegneria Informatica

3.4. TEACHING ASSISTANT

- [2011/...] 20 hours per year about *Interoperability, HL7, RIM, CDA, RDF, OWL, SPARQL, ontology-base data access* in *ICT for Health Care and Life Science* – School of Industrial and Information Engineering, Master of Science in Information Engineering and Master of Science in Biomedical Engineering – taught by prof. M. Masseroli
- [2016/2018] 20 hours about *concurrency control, xQuery, Streaming DB, and NoSQL in database 2* – Politecnico di Milano, School of Industrial and Information Engineering, Master of Science in Information Engineering – taught by prof. Sara Comai
- [2004/2005] 4 hours of *Semantic Web and Semantic Web Services* in *Argomenti Avanzati di Sistemi Informativi A* – Politecnico di Milano, Facoltà di Ingegneria dell'Informazione, Laurea di secondo livello in Ingegneria Informatica
- [2003/2005] 20 hours per year about *SQL and XML in Informatica per l'ambiente e il territorio* – Politecnico di Milano, Facoltà di Ingegneria Civile Ambientale e Territoriale, Corso di Laurea Specialistica in Ingegneria per l'Ambiente e il Territorio
- [2001/2003] 20 hours per year about *SQL and XML in Fondamenti di Informatica II*, Politecnico di Milano, Facoltà di Ingegneria Civile Ambientale e Territoriale, Corso di Laurea Specialistica in Ingegneria per l'Ambiente e il Territorio

3.5. TUTORIALS

- 2020-03-30 *Declarative Languages for Big Streaming Data* at EDBT 2020 – half-day tutorial jointly presented with R. Tommasini, S. Sakr and Hojjat Jafarpour
<http://streaminglangs.io/events/edbt20.html>
- 2019-06-25 *An Outlook to Declarative Languages for Big Streaming Data* at DEBS 2019 – half-day tutorial jointly presented with R. Tommasini, S. Sakr and M. Balduini
<http://streaminglangs.io/events/debs19.html>
- 2019-06-02 *Continuous Analytics of Linked Data Streams* at ESWC 2019 – half-day tutorial jointly presented with J.-P. Calbimonte, R. Tommasini, R. Keski-Särkkä, and E. Blomqvist.
<http://streamreasoning.org/tutorial-eswc19>
- 2019-05-13 *Continuous Analytics of Web Streams* at The Web Conf 2019 – half-day tutorial jointly presented with J.-P. Calbimonte, R. Tommasini, and A. Bifet.
<http://streamreasoning.org/events/tutorial-www19>
- 2018-10-28 *Stream Reasoning - Incremental Reasoning Upon Rapidly Changing Information* at KR 2018 - half-day tutorial jointly presented with F. Heintz (Linköping University)
<http://streamreasoning.org/events/sr2018>
- 2018-09-24 *Engineering of Web Stream Processing Applications* at the 14th Reasoning Web Summer School - half-day tutorial
<http://streamreasoning.org/events/wasp-rw-2018>
- 2018-06-05 *Engineering of Web Stream Processing Applications* at ICWE 2018 - half-day tutorial jointly presented with R. Tommasini (Politecnico di Milano), A. Mauri (TU-Delft) and M. Balduini (Politecnico di Milano).
<http://streamreasoning.org/events/wasp-icwe-2018>
- 2017-10-21 *How to Build a Stream Reasoning Application (StreamApp)* at ISWC 2017 – full-day event jointly presented with D. Dell'Aglio (Department of Informatics, University of Zurich), Thu Le-Pham (INSIGHT Centre for Data Analytics, NUI Galway), Alessandra Mileo, (INSIGHT Centre for Data Analytics, Dublin City University), and R. Tommasini (DEIB, Politecnico di Milano)
<http://streamreasoning.org/events/streamapp2017>
- 2016-10-17 *Tutorial on RDF Stream Processing* at ISWC 2016 - full-day event jointly presented with Muhammad Intizar Ali (Insight Centre for Data Analytics), D. Dell'Aglio (Politecnico di Milano), and J.-P. Calbimonte (École Polytechnique Fédérale de Lausanne)
<http://streamreasoning.org/events/rsp2016>
- 2016-06-20 *Stream Reasoning: Managing Velocity and Variety in Big Data* - full-day event jointly presented with D. Dell'Aglio (Politecnico di Milano) and A. Margara (Politecnico di Milano) at the 10th ACM International Conference on Distributed and Event-Based Systems 2016.

- <http://streamreasoning.org/events/srdebs2016>
- 2015-10-11 *Stream Reasoning for Linked Data* – full-day event jointly presented with M.I. Ali (Insight Centre for Data Analytics), J.-P. Calbimonte (École Polytechnique Fédérale de Lausanne), D. Dell’Aglia (Politecnico di Milano) A. Mileo (Insight Centre for Data Analytics) at International Semantic Web Conference 2015, Bethlehem, Pennsylvania, USA
- <http://streamreasoning.org/events/sr4ld2015>
- 2015-10-11 *Semantics Approach to Big Data and Event Processing* – three days event jointly presented with prof. Amit Sheth (knoesis Lab – Wright State University), P. Anantharam (knoesis Lab – Wright State University), R. Tommasini (Politecnico di Milano) and P. Kapanipathi (knoesis Lab – Wright State University), Dayton, Ohio, USA
- <http://wiki.knoesis.org/index.php/BigDataTutorial>
- 2015-06-26 Stream Reasoning Tutorial – two day tutorial on Stream Reasoning for Poznań University of Economics Master Students, Poznań, Poland
- <http://emanueledellavalle.org/Teaching/srt2015.html>
- 2014-10-19 *Stream Reasoning for Linked Data* – full-day event jointly presented with prof. Oscar Corcho, PhD J.-P. Calbimonte, D. Dell’Aglia and M. Balduini at International Semantic Web Conference 2014, Riva del Garda, Italy
- <http://streamreasoning.org/events/sr4ld2014>
- 2013-10-21 *Stream Reasoning For Linked Data* – full-day event jointly presented with prof. O. Corcho, prof. J.Z. Pan, PhD J.-P. Calbimonte, D. Dell’Aglia and M. Balduini at International Semantic Web Conference 2013, Sydney, Australia
- <http://streamreasoning.org/sr4ld2013>
- 2011-06-09 *Stream Reasoning For Linked Data* – half-day event jointly presented with prof. J.Z. Pan at Semantic Technology Conference (SemTech) 2011, San Francisco, CA, USA
- 2011-05-31 *Stream Reasoning For Linked Data* – full-day event jointly presented with prof. J.Z. Pan at Extended Semantic Web Conference (ESWC) 2011, Heraklion, Crete, Greece
- <http://streamreasoning.org/Past-Events/sr4ld2011>
- 2010-11-13 *4th Large Knowledge Collider Early Adopters Tutorial* – full-day event jointly presented with LarKC consortium at Beijing University of Technology, Beijing, China
- <http://www.larkc.eu/early-adopters/4th-early-adopters-tutor>
- 2010-07-05 *Realizing a Semantic Web Application* – half-day event at International Web Engineering Conference (ICWE) 2010, Vienna, Austria
- <http://swa.cefriel.it/Teaching/RSWA2008>
- 2010-05-30 *3rd Large Knowledge Collider Early Adopters Tutorial* – full-day event jointly presented with LarKC consortium at Extended Semantic Web Conference (ESWC) 2010, Heraklion, Crete, Greece
- <http://www.larkc.eu/early-adopters/3rd-early-adopters-tutorial/>
- 2009-10-25 *2nd Large Knowledge Collider Early Adopters Tutorial* – full-day event jointly presented with LarKC consortium at International Semantic Web Conference (ISWC) 2009, Washington, DC, USA
- <http://www.larkc.eu/early-adopters/2nd-early-adopters-tutorial/>
- 2008-10-26 *Realizing a Semantic Web Application* – half-day event at ISWC 2008, Karlsruhe, Germany
- http://videlectures.net/iswc08_dellaValle_rswa/
- 2008-05-07 *Semantic Web Application Development* – half-day at Business Information Systems (BIS) 2008
- 2007-04-26 *Applied Semantics* - half-day event at Business Information Systems (BIS) 2007
- 2006-12-18 *An overview of Semantic Web Service at Semantic Web Applications and Perspectives (SWAP)* 2006, Pisa, Italy
- 2005-12-02 *An overview of Semantic Web Services* at Università di Milano Bicocca, Milano, Italy
- 2005-11-04 *An overview of Semantic Web* at Università di Milano Bicocca, Milano, Italy

3.6. INVITED TALKS AND KEY NOTES

- 2022-10-18 *motus.ml: Never Stop Learning at the Edge*. Keynote at the 1st Stream Reasoning meets Cloud-Edge Intelligence Workshop, Siemens Technology, Munich, Germany
- 2020-06-24 *Stream Reasoning: From Theory to Practice*. 16th Reasoning Web Summer School, co-located with declarative AI 2020

- 2018-09-26 *Engineering of Web Stream Processing Applications*. 14th Reasoning Web Summer School, Luxembourg
- 2018-02-27 *Ten years of Stream Reasoning. Now what?* Huawei Research, Munich
- 2018-02-26 *Ten years of Stream Reasoning. Now what?* AGTInternational, Frankfurt
- 2017-06-15 *Ten years of Stream Reasoning. Now what?* University of Oslo, Norway
- 2016-10-28 *Using Big Data and Stream Reasoning for everyday life monitoring*. Como, Italy
- 2016-07-20 *Listening to the pulse of our cities with Stream Reasoning (and few more technologies)*, 12th Semantic Web Summer School, Bertinoro, Italy
- 2015-11-24 *Stream Reasoning: mastering the velocity and the variety dimensions of Big Data at once*, Fondazione Bruno Kessler, Trento, Italy
- 2015-11-10 *Stream Reasoning: mastering the velocity and the variety dimensions of Big Data at once*, TU Wien, Wien, Austria
- 2015-11-03 *Stream Reasoning: mastering the velocity and the variety dimensions of Big Data at once*, University of Oslo, Oslo, Norway
- 2015-06-22 *Listening to the pulse of our cities fusing Social Media Streams and Call Data Records*, BIS 2015, Poznań, Poland
- 2015-06-21 *Stream Reasoning*, SIEMENS, Munich, Germany
- 2013-11-22 *A Big Data Infrastructure to sense the pulse of the city in real-time* at IBM, Segrate, Italy
- 2013-10-21 *Listening to the pulse of our cities during City Scale Events* at DeRiVE 2013 Workshop collocated with ISWC 2013, Sydney, Australia
- 2012-11-06 *Order Matters! Harnessing a World of Orderings for Reasoning over Massive Data* at University of Trento, Italy
- 2012-09-25 *Challenges, Approaches, and Solutions in Stream Reasoning* at Semantic Days, Stavanger, Norway
- 2012-02-27 *BOTTARI: How to offer innovative services listening to the Social Media* at Senso Comune, University of Trento, Trento, Italy
- 2011-07-15 *Stream Reasoning* at Asian Semantic Web School 2011, University of Incheon, Seoul, Korea
- 2011-01-18 *Stream Reasoning, where we got so far* at Oxford University, UK
- 2009-03-02 *Building Mobile Data Mashups Using LarKC* at NTT-DoCoMo Labs, Munich, Germany
- 2008-02-19 *Le sfide per i CIO delle Enterprise 2.0 at Virtualisation & Enterprise 2.0* organized by IDC, Milano, Italy
- 2007-11-15 *Web 2.0: le sfide per le moderne dot-com at WEB 2.0 – Tecnologie per il business o fenomeno sociale?* organized by Guide Italy (<http://www.guideitalia.org/>), Milano, Italy
- 2007-11-02 *SWE-ET Model Driven Semantic Web Application Development* at Almaden IBM Research Labs, CA, USA
- 2007-10-15 *SOA e Web 2.0* at *business Integration Forum 2007* organized by IIR, Milano, Italy
- 2007-03-15 *Future and perspectives for Service Oriented Architecture at Service Oriented Architecture (SOA): dalla sperimentazione all'implementazione strategica* organized Business International, Milano, Italy
- 2006-11-29 *SWE-ET: the Italian solution to the Semantic Web Service Challenge a The Semantic Dimension of Information Technology* organized by Fondazione IBM, Rome, Italy
- 2006-10-27 *Making already existing IT architecture flexible: from fragmented application to controllable business processes* at *Business Integration Forum 2006* organized by IIR
- 2006-07-05 *SOA: between myth and reality, the value of experience* at *SOA Day* organized by Ferrovie dello Stato, Rome, Italy
- 2006-06-21 *The market of Service Oriented Architecture: future and perspectives* at *Service Oriented Architecture (SOA): dalla sperimentazione all'implementazione strategica* organized by Business International, Roma, Italy
- 2006-03-15 *SOA: what is it? How it works? What's going on?* at *Convegno SOA* organized by IDG, Milan, Italy
- 2006-01-26 *Basta Cercare, Vogliamo Trovare!* at *IDC conference on Content Management Systems*, Milan, Italy
- 2005-04-10 *Evoluzione dei Web Services per l'interoperabilità: approcci a supporto della dinamicità e flessibilità nell'integrazione di infrastrutture IT* at *IDC conference on Web Services and Enterprise Application Integration*, Milan, Italy
- 2005-01-27 *Approcci innovativi allo sviluppo di portali: Semantic Web, accessibilità e multimodalità* at *IDC conference on Content Management Systems*, Milan, Italy

- 2004-02-22 *A Semantic approach to Interoperability at Perspectives in eGovernment and eTransaction for Innovation in Europe*, Milano, Italy
- 2002-05-15 *Strumenti esperti per la rappresentazione della conoscenza at The Art of Knowledge Management* organized by OpenText, Getronics and Cisco Systems, Milan, Italy

4. PROFESSIONAL ACTIVITIES

4.1. AWARDS, PRIZES, AND NOMINATIONS

- 9-2026 motus ml, the academic spin-off he co-founded, wins the Satellite Data Use – Downstream award at **BEX – Beyond Exploration Expo 2026**
- 12-2024 Tenet: Benchmarking Data Stream Classifiers in Presence of Temporal Dependence won IEEE BigData'24 **best student paper runner-up award**
- 9-2021 Chimera: A Bridge Between Big Data Analytics and Semantic Technologies won ISWC'21 **best paper award**
- 7-2021 Supporting an Expert-centric Process of New Product Introduction With Statistical Machine Learning won BIS'21 **best paper award**
- 5-2021 RSP4J: An API for RDF Stream Processing won ESWC'21 **best paper award**
- 6-2019 his paper on *D2IA: Stream Analytics on User-Defined Event Intervals* won CAiSE'19 **best paper award**.
- 6-2017 his paper on *Incremental Reasoning on Streams and Rich Background Knowledge* was **nominated** for the **Best Paper 7 years** award of ESWC 2017
- 10-2016 his paper on *CitySensing: Fusing City Data for Visual Storytelling* wins the **best paper** award for IEEE MM 2016
- 10-2015 he is awarded the *ASP fellowship* as **best tutor**
- 6-2014 *Augmented Participation to Live Events through Social Network Content Enrichment* wins the *AI mashup Challenge 2014*
- 9-2013 he wins the **IBM Faculty Award 2013** for the research program on *City Data Fusion*
- 5-2013 *TwindexFuorisalone: Social Listening of Milano Design Week* wins the *AI mashup Challenge 2013*
- 9-2011 *Bottari*, an App to deliver personalized and location-based recommendations by continuous analysis of social media, wins the *Semantic Web Challenge 2011*
- 6-2011 *Traffic LarKC* wins the *AI mashup Challenge 2011*
- 6-2008 *Squiggle* Business Plan wins the second prize of *StartCup Milano Lombardia 2008* and it is accepted among the finalist of Premio Nazionale Innovazione
- 6- 2007 *Enabling the European Patient Summary Through Triplespaces* wins *Best Paper Award* at Computer-Based Medical Systems
- 2- 2007 he wins *CEFRIEL's Excellence Award 2007* for having started up and brought to internal level CEFRIEL's Semantic Web Practice.
- 11- 2006 *Flexible Specification of Semantic Services using Web Engineering Methods and Tools* wins the *Best Paper Award* at Semantic Web and Software Engineering Workshop 2006 co-located con ISWC 2006
- 9- 2006 he wins the **IBM Faculty Award 2006** for the research on Model Driven Semantic Web Application Development (SWE-ET)
- 6-2006 SWE-ET is evaluated as “the most complete solution presented at Phase-II of Semantic Web Service Challenge”

4.2. BOARD OF INTERNATIONAL JOURNALS

- 2023/today Area Editor of Transactions on Graph Data and Knowledge (TGDK)
- 2014/today Member of the editorial board of Journal of Web Semantics
<http://www.journals.elsevier.com/journal-of-web-semantics/>
- 2011/2017 Member of the editorial board of International Journal On Semantic Web and Information Systems
<http://www.ijswis.org/>

4.3. CONFERENCE ORGANIZATION

- 2021 *General Chair* of the 15th ACM International Conference on Distributed and Event-Based Systems (DEBS 2021)
- 2021 *Chair* of the Data Dynamics, Quality and Trust *Track* of the Extended Semantic Web Conference 2021
- 2019 *Senior PC member* for the International Semantic Web Conference 2019
- 2019 *Chair* of the Velocity on the Web *Track* of the Extended Semantic Web Conference 2019
- 2018 *Chair* of the Benchmarking and Empirical Evaluations *Track* of the Extended Semantic Web Conference 2018
- 2017 *Chair* of the Mobile Web, Sensors and Semantic Streams *Track* of the Extended Semantic Web Conference 2017

2011 *Chair of the Reasoning Track of the Extended Semantic Web Conference 2011*

4.4. WORKSHOP ORGANIZATION

- 2026 *Stream Reasoning Workshop 2026* (SRW 2026), Université Gustave Eiffel, Marne-la-Vallée, France, November 16-17, 2026
- 2026 *1st Streaming Continual Learning Bridge* (StreamingCL 2026) co-located with the 40th AAAI Conference on Artificial Intelligence (AAAI 2026), Singapore; co-editor of the proceedings (CEUR-WS Vol. 4183)
- 2025 *Streaming Continual Learning: fast adaptation and knowledge consolidation in dynamic environment* special session at ESANN 2025, Bruges, Belgium
- 2024 *Stream Reasoning Workshop 2024* (SRW 2024), KU Leuven Kulak, Kortrijk, Belgium, December 12-13, 2024
- 2023 *Stream Reasoning Workshop 2023* (SRW 2023), INSA Lyon, France, December 4-6, 2023
- 2022 *Stream Reasoning Workshop 2022* (SRW 2022), Amsterdam, the Netherlands
- 2021 *Stream Reasoning Workshop 2021* (SRW 2021), 5th edition, Politecnico di Milano, Italy, October 4-6, 2021 (blended, with a hackathon)
- 2020 *Stream Reasoning 2020* (SR2020) annual reunion of the Stream Reasoning community jointly organized with F. Heintz (Linköping University)
- 2019 *Stream Reasoning 2019* (SR2019) annual reunion of the Stream Reasoning community jointly organized with F. Heintz (Linköping University)
- 2019 *Emerging trends on Web Velocity and the Web of Things* at The Web Conf 2019
- 2017 *Web Stream Processing 2017* (WSR2017) co-located with International Semantic Web Conference 2017
- 2016 *Stream Reasoning 2016* (SR2016) co-located with International Semantic Web Conference 2016
- 2015 *Ordering and Reasoning 2015* (OrdRing 2015) co-located with International Semantic Web Conference 2015
- 2014 *Ordering and Reasoning 2014* (OrdRing 2014) co-located with International Semantic Web Conference 2014
- 2013 *Ordering and Reasoning 2013* (OrdRing 2013) co-located with International Semantic Web Conference 2013
- 2011 *Ordering and Reasoning 2011* (OrdRing 2011) co-located with International Semantic Web Conference 2011
- 2010 *New Form of Reasoning 2010* (NeFoRS 2010) co-located with Extended Semantic Web Conference 2010
- 2009 *Stream Reasoning 2009* (SR 2009) co-located with Extended Semantic Web Conference 2009 (ESWC 2009)
- 2008 *International Workshop on Evaluation of Ontology-based Tools and the Semantic Web Service Challenge* (EON-SWSC-2008) co-located with European Semantic Web Conference 2008 (ESWC 2008)

4.5. REFEREE

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|--|--|
| 2026-09 – Springer Nature – Scientific Reports | 2016-08 – Elsevier – Journal of Logical and Algebraic Methods in Programming (JLAMP) |
| 2026-04 – Elsevier – Neurocomputing (2 papers) | 2016-07 – IOS press – Semantic Web Journal |
| 2022-06 – Springer – Arabian Journal for Science and Engineering | 2016-05 – ACM - TOIT |
| 2021-12 – Elsevier – Journal of Web Semantics | 2016-03 – Springer – Journal of Data Semantics |
| 2019-09 – Elsevier, Journal of Artificial Intelligence | 2016-02 – Springer - Social Network Analysis and Mining |
| 2019-06 – IEEE – Access | 2016-01 – Elsevier – Journal of Web Semantics |
| 2019-06 – Springer - Social Network Analysis and Mining | 2015-12 – Elsevier – Journal of Web Semantics (2 papers) |
| 2019-05 – IOS press – Semantic Web Journal | 2015-12 – Springer – Journal of Data Semantics |
| 2018-06 – IEEE – Access | 2015-11 – Elsevier – Journal of Web Semantics |
| 2018-03 – Springer – Journal of Web Semantics (2 papers) | 2015-09 – Elsevier - Journal of Web Semantics |
| 2017-11 – Springer – Journal of Web Semantics | 2015-08 – Springer – Journal of Data Semantics |
| 2017-10 – Elsevier – JLAMP | 2015-06 – Elsevier - Journal of Web Semantics |
| 2016-10 – Springer – Journal of Web Semantics (2 papers) | 2015-05 – IOS press – Semantic Web Journal |
| | 2015-05 – ACM - TOIT |
| | 2015-03 – IOS press – Semantic Web Journal |

- 2014-03 – Elsevier - Journal of Web Semantics
 2014-01 – Elsevier - JPDC
 2013-11 – ACM - Sigmod Record
 2013-09 – Springer - Knowledge and Information Systems
 2013-09 – Elsevier - Journal of Web Semantics
 2013-08 – Elsevier - Journal of Web Semantics
 2013-05 – IOS press – Semantic Web Journal
 2013-03 – Elsevier - Journal of Web Semantics
 2013-01 - IGI Global - International Journal On Semantic Web and Information Systems
 2012-12 – ACM - Transactions on the Web (TWEB)
 2012-12 – IOS press – Semantic Web Journal
 2012-12 – ACM/Springer – VLDB Journal
 2012-08 – ACM - Transactions on the Web
 2012-08 – IEEE Software
 2012-06 – IOS press – Semantic Web Journal
 2012-06 – Springer – AI Mashup Challenge Book
 2012-06 – Springer – Search Computing Book
 2012-06 – IOS press – Semantic Web Journal
 2012-06 – Rinton Press - Journal of Web Engineering
 2012-04 – Elsevier - Journal of Web Semantics
 2012-03 – Elsevier - Journal of Web Semantics
 2012-01 – IGI Global - International Journal of Information Technology and Web
 2012-01 – ACM - Transactions on the Web
 2012-01 – IEEE Internet Computing
 2011-05 – IGI Global - International Journal On Semantic Web and Information Systems
 2011-03 – Springer - Knowledge and Information Systems
 2011-01 – Elsevier - Journal of Web Semantics
 2011-01 – Elsevier - Data & Knowledge Engineering
 2010-12 – IEEE - Transactions on Systems, Man, and Cybernetics
 2010-11 – Elsevier - Journal of Web Semantics
 2010-10 – Elsevier - Journal of Web Semantics
 2010-09 – Wiley - Software: Practice and Experience
 2010-08 – IEEE - Transactions on Systems, Man, and Cybernetics
 2010-07 – Elsevier - Engineering Applications of Artificial Intelligence
 2010-07 – Elsevier - Journal of Web Semantics
 2010-07 – IEEE - Transactions on Software Engineering
 2009-03 – IEEE - Internet Computing
 2009-12 – Elsevier - Information Systems
 2009-12 – IEEE - Internet Computing
 2009-09 – ACM - Transactions on the Web

4.6. EVALUATION OF RESEARCH PROJECT

- 2021-02 *ERC Advanced Grant* evaluator
 2019-1 *ERC starting grant* evaluator
 2017-11 *ERC starting grant* evaluator
 2013-11 *Project Proposal Evaluator* for the PICO_LOD project funded by Provincia Autonoma di Trento
 2013-09 *Project Proposal Evaluator* for research project funded by Austrian Science Foundation
 2013-03 *Project Proposal Evaluator* for a PRIN project funded by MIUR
 2012-06 *Project Proposal Evaluator* for Urban Life and Mobility projects funded by EIT ICT-labs

4.7. OPPONENT MEMBER OF DOCTORAL EXAMINATION COMMITTEE

- 2026-10 PhD defense of Anton Lee (scheduled) for Victoria University of Wellington, New Zealand
 2025-04 PhD defense of Vincenzo Nucci for University of Camerino, Italy
 2025-01 President of the PhD defense committee of Mathyas Giudici for Politecnico di Milano, Italy
 2021-11 PhD defense of Temitope Ajileye for University of Oxford, UK
 2021-04 PhD defense of Carlos Badenes-Olmedo for Universidad Politécnica de Madrid, Spain
 2021-02 External reviewer of the PhD thesis of Víctor Rampérez for Universidad Politécnica de Madrid, Spain
 2019-05 PhD defense of Le Thi Anh Thu Pham for National University of Ireland Galway
 2019-02 PhD defense of Pieter Bonte for Ghent University, Belgium
 2018-03 PhD defense of Rui Yan for the Rensselaer Polytechnic Institute, USA
 2017-05 Licenciante thesis of Daniel de Leng for Linköping University, Sweden

4.8. PROGRAM COMMITTEES MEMBERSHIP

- 2026-05 – ISWC 2026
 2024-12 – ESANN 2025
 2019-12 – ESWC 2020
 2019-11 – The Web Conf 2020
 2019-05 – ISWC 2019
 2018-08 – EKAW 2018
 2018-07 – Semantics 2018
 2018-05 – ISWC 2018
 2018-04 – DEBS 2018
 2018-01 – ICWE 2018
 2017-11 – The Web Conf 2018
 2017-06 – ISWC 2017

2016-11 – WWW 2017	2012-03 – ESWC 2012 Demo
2016-08 – EKAU 2016	2012-04 – ICWS 2012
2016-06 – ISWC 2016	2012-02 – ESWC 2012
2016-05 – RuleML 2016	2012-03 – LDOW 2012
2016-03 – WebScience 2016	2011-05 - AI mashup Challenge 2011
2016-01 – ICWE 2016	2011-07 – DATAVIEW 2011
2016-01 – ESWC 2016	2011-07 – Workshop on Emerging Web Services Technology 2011
2015-05 – ISWC 2015	2011-08 – ODBASE 2011
2015-01 – ESWC 2015	2011-08 – SDOW 2011
2014-08 – EKAU 2014	2011-11 – AINA 2012
2014-06 – RuleML Challenge 2014	2011-12 – WWW 2012
2014-03 – CrowdUI 2014	2010-07 – Workshop on Emerging Web Services Technology 2010
2014-01 – ESWC 2014	2010-06 – Conference on Business Process and Services Computing
2013-07 – ODBASE 2013	2009-07 – Workshop on Emerging Web Services Technology 2009
2013-06 – AI mashup Challenge post Proceedings	2009-01 - Workshop on Advances in Accessing Deep Web
2013-06 – RuleML-challenge	2008-07 – Workshop on Emerging Web Services Technology 2008
2013-04 – AI mashup Challenge 2013	2008-01 – Workshop on Advances in Accessing Deep Web
2013-02 – ESWC 2013	
2013-01 – WWW 2013	
2012-11- SWESE 2012	
2012-10 – EAAI 2012	
2012-06 – ODBASE 2012	
2012-06 – Conference on Business Process and Services Computing	

4.9. RESEARCH PROJECTS

01/2020/12-2022	SCOUT EIT Digital: IoT Security and Life Cycle Management is an strategic activity (namely AAA), funded by EIT Digital, which aims at starting up a company around IoT security. He jointly developed this project with RIoT secure (Sweden) and prof. M. Brambilla, he will take the <i>lead</i> of the Data Science for IoT Security task.
01/2020/12-2020	Consumer-centric demand forecast and sale predictions for the fashion industry is an activity, funded by EIT Digital, which aims at easing the successful introduction of new products in the fashion industry and predict sales. He jointly developed this project with MEA s.r.l., he will be the <i>scientific coordinator</i>.
01/2020/12-2020	Shared Cityhub for Parcel Deliveries is an activity, funded by EIT Digital, which aims at sustainable and green last-mile parcel delivery. He jointly developed this project with Bookit.com (Finland), he will take the <i>lead</i> of the Italian pilot.
01/2019/12-2019	Data Science Blended Course for non-IT Professionals is an activity, funded by EIT Digital, which aims at delivering a blended course consisting in a mooc as well as a face-to-face event to train data-savvy manager. He jointly <i>lead</i> this project with prof. M. Brambilla.
01/2018/12-2018	Welcome is the continuation of the CrowdInsight activity, funded by the EIT Digital, and led by TIM. He is one of the promoters of the idea and brings its expertise in Big Data Analytics.
01/2017/12-2017	CrowdInsight is an activity, funded by the EIT Digital, and led by TIM, which aims at understanding people dynamics in urban spaces. It actively <i>monitors urban environments</i> detecting the composition, dynamics and motivations of crowds. It provides data analytics and actionable insights to support <i>decision-making and planning</i> among administrations and businesses. He is one of the promoters of the idea and brings its expertise in Big Data Analytics.

- 01/2017/12-2017 **BeCamGreen activity** is an activity, funded by the EIT Digital, and led by INDRA, which aims fostering the adoption of high occupancy lanes.
He brings it expertise in real-time predictive Big Data Analytics to support INDRA in forecasting traffic and enforcing policies on high occupancy lanes.
- 01-2015/12-2016 **Personal Social Media Analytics within the HII Future Cloud activity** is a task, funded by the EIT Digital, which aims at providing personal social media analytics services. The goal is to offer this type of service within a Personal Data Store under development in Telecom Italia.
He is the *principal investigator* of the task.
- 01-2015/12-2015 **CitySensing installation for EXPO within the 3cixty activity** is a task, funded by the ICT Labs of the European Institute of Innovation and Technologies (EIT), which aims deploying the CitySensing installation on 10 eWalls for the full duration of EXPO 2015 in Milano. The project is a joint effort with Telecom Italia and the Density Design Lab led by prof. Ciuccarelli.
He is the *principal investigator* of the task.
- 09-2013/12-2014 **City Data Fusion for Event Management** is a activity, funded by the ICT Labs of the European Institute of Innovation and Technologies (EIT), which aims at enhancing the ability to feel the pulse of our cities to deliver innovative services. To this end, we started collecting in real-time data streams of different types ranging from social networks – specifically, Twitter, Instagram and Foursquare – to Mobile Phone Networks and sensors such as Traffic Flow, Weather and Pollution Sensors. We are also exploring pro-active crowdsourcing techniques, tailored to incentives applicable in urban environment and to urban life styles, to cleanse and semantically enrich those data streams. Last, but not least, we are experimenting with innovative technologies, methodologies and systems for data fusion, analysis and visualization to magnify the value of those data streams.
He is the *principal investigator* of the activity.
- 10-2010/9-2014 **Urban Games with a Purpose for PlanetData.** PlanetData aimed to establish a sustainable European community of researchers that supports organizations in exposing their data in new and useful ways. PlanetData pushed forward the state-of-the-art in large-scale data management and its application to the creation of useful, open data sets. This was motivated by the increasing reliance of business on large public data; the uptake of open data principles in many vertical sectors; and the need of research communities to make sense out of petabytes of scientific data, to describe and to expose this data in ways that encourage and enable collaboration.
He contributed with his research on *crowdsourcing* techniques, whose incentives are tailored to urban lifestyle and needs, to the *Urban Games work package*.
- 10-2009/11-2013 **Search Computing (SeCo)** is a project funded by the European Research Council (ERC), responding to the 2008 Call for "IDEAS Advanced Grants", a program dedicated to the support of investigation-driven frontier research. Search computing focuses on building the answers to complex search queries like "Where can I attend an interesting conference in my field close to a sunny beach?" by interacting with a constellation of cooperating search services, using ranking and joining of results as the dominant factors for service composition.
He participated to the development of SeCo concept and lead the group dedicated to Technology and Business Watch
- 4-2008/10-2011 The **Large Knowledge Collider (LarKC)** aim was to develop the Large Knowledge Collider (LarKC, for short, pronounced "lark"), a platform for massive distributed incomplete reasoning that will remove the scalability barriers of currently existing reasoning systems for the Semantic Web. This was achieved by: *a)* enriching the current logic-based Semantic Web reasoning with methods from information retrieval, machine learning, information theory, databases, and probabilistic reasoning, *b)* employing cognitively inspired approaches and techniques such as spreading activation, focus of attention, reinforcement, relevance reasoning, and bounded rationality; and *c)* building a distributed reasoning platform and realizing it both on a high-performance computing cluster and via "computing at home".
He was a *member of the proposal writing team*. His major contributions to the project are the *Stream Reasoning* concept, its embodiment in *C-SPARQL* and the lead of the *Urban Computing* use case.
- 1-2008/12-2009 **Service-Finder** developed a platform for service discovery in which Web Services are embedded in a Web 2.0 environment. The project addresses the problem of utilising the Web Service technology for a wider audience by realising a comprehensive framework for

Discovery. The approach is to develop novel means of obtaining the underlying semantic models for discovery, by analysing available Web content, leveraging direct and indirect user feedback on the extracted data and exploiting context information. The result will be a Search Engine that enables users to find up-to-date information on available Web Services, similarly to current search engines for content pages.

He was the *principal investigator* of the project.

- 1-2006/6-2008 **Single European Employment Market-Place (SEEMP)** aimed at designing and implementing in a prototypal way an interoperability architecture for public e-Employment services which encompasses cross-governmental business and decisional processes, interoperability and reconciliation of local professional profiles and taxonomies, semantically enabled web services for distributed knowledge access and sharing.
He was *member of the proposal writing*, he acted as *Technical and Scientific Manger* during the project and contributed to the project with his research on *Web Service Discovery*.
- 4-2006/6-2008 **Triple Space Communication (TripCom)** goal was the development of a highly scalable, semantically enhanced communication infrastructure that is the result of the integration of Tuple Space, Semantic Web (triple), and Web service technologies.
He was *member of the proposal writing*, lead the *eHealth use case* and was a member of the exploitation board of the project.
- 4-2006/6-2008 **Semantics Utilised for Process management within and between EnteRprises (SUPER)** aimed to make a quantum leap with regard to efficiency and effectiveness in modelling and managing of business processes. It looked to enable companies to use information technology more efficiently and to improve the alignment between IT and business. In particular SUPER worked on enabling companies to: a) overcome the gap between business and IT, b) implement new business processes more quickly and efficiently, and c) make business processes accessible to reasoning and (advanced) querying.
He worked on the *project show cases* and participated to the *standardization* work of the Semantic Execution Environment at OASIS.
- 7-2006/6-2008 **Networked Peers for e-business (NeP4B)** aimed to contribute innovative ICTs solutions for SMEs, by developing an advanced technological infrastructure to enable companies of any nature, size and geographic location to **search for partners, exchange data, negotiate and collaborate** without limitations and constraints. The infrastructure was based on independent and interoperable semantic peers who behave as nodes of a virtual network. With these results the NeP4B project intended to provide a substantial contribute to the Single European Electronic Market (SEEM) concept, which represents one of the core aspects of the European Information Society 2010 initiative.
He *lead the user requirement work package* and contributed to the project with his research on *Semantic Web Service Discovery*.
- 1-2004/6-2007 **COCOON** was an Integrated Project aimed at supporting health care professionals in reducing risk management in their daily practices by building knowledge driven and dynamically adaptive networked communities within European healthcare systems. The main objective of COCOON project is to support knowledge driven collaborative practices in Networks of Healthcare Professionals in order to minimise medical errors in diagnosis and treatment. On this basis the main COCOON project research directions are twofold: on one side the socio-economics research on health care risk management and the related business model for reducing risk by enabling the COCOON technologies; and on the other side the technological research that wants to deal an innovative tool-set for risk management.
He was the *deputy Technical Manger* of the project and contributed to the project with his research on *Semantic Portals* and *Web Service Discovery*.
- 7-2003/6-2005 **NomadicMedia** is an ITEA project that developed solutions to allow consumers to enjoy multimedia content and employ interactive services at the times and in the places they prefer, using devices that best suit their circumstances.
He contribute to the project with his research on *Web Service Discovery*.
- 11-2000/10-2002 **Octane24** aimed to deploy and validate an Open Contracting Service (OCS) to establish electronic contracts practice among European SMEs. OCTANE provided a solution by leveraging unproven new ICT-technology into user-friendly applications, and developing business models for encouraging access to low cost and reliable business information by improving the "time to contract".
He designed and developed an *electronic notary* using a workflow engine and XML signature.

4.10. STANDARDIZATION ACTIVITIES

- 8-2013/12-2016 Proposer and active member of W3C RDF Stream Processing Community Group
<http://www.w3.org/community/rsp/>
- 11-2007/12-2008 Invited Expert al W3C SWS Challenge Testbed Incubator
<http://www.w3.org/2005/Incubator/swsc/>
- 10-2005/4-2009 Active member of Semantic Execution Environment TC at OASIS
<https://www.oasis-open.org/committees/semantic-ex/>
- 6-2005/6-2008 Contributor to W3C Semantic Web Health Care and Life Science WG
- 6-2004/5-2008 Active member of WSMO WG (Web Service Modeling Ontology)
<http://www.wsmo.org/>

4.11. OTHER ACTIVITIES

- 1-2012/12-2014 *National Action Line Leader* of Urban Life and Mobility for EIT ICT Labs
- 10-2007/10-2008 *Coordinator* of the Testbeds and Challenge Service for the Semantic Technology Institute International
- 4-2006/10-2008 *Project Manager* for evaluating the possibility to create a CEFRIEL spin-off to commercialize Squiggle (CEFRIEL's Semantic Search Engine)
- 6-2005/7-2008 *Program Manager* of CEFRIEL's Semantic Web Activities.

4.12. UNIVERSITY SERVICE

- 2018-... member of the committee for the evaluation of international students for the degree in Engineering of Computing Systems of Politecnico di Milano - Milano Campus.

4.13. STUDENT SUPERVISION

PHD STUDENTS (ONGOING)

- Marcello Matteo Declich: Continuous Multimodal Foundation Models (tentative title)
- Lorenzo Iovine: Continuous Multimodal Data and Knowledge Fusion (tentative title)

PHD STUDENTS (GRADUATED)

- 2026-06 Federico Giannini: A First Step Towards Streaming Continual Learning in Dynamic Environments
- 2026-06 Giacomo Ziffer: Beyond IID: Online Learning for Temporal and Evolving Data Streams
- 2023-05 Alessio Bernardo: Streaming Machine Learning for Unbalanced Non-Stationary Time Series
- 2020-11 Sivam Pasupathipillai: Modern Anomaly Detection: Benchmarking, Scalability and a Novel Approach (PhD School in ICT, University of Trento, co-advised with prof. Y. Velegrakis)
- 2020-02 Riccardo Tommasini: Velocity on the Web
- 2019-02 Marco Balduini: On The Continuous And Reactive Analysis Of A Variety Of Spatio-Temporal Data
- 2018-07 Shima Zahmatkesh: On Relevant Query Answering over Streaming and Distributed Data
- 2016-07 Daniele Dell'Aglia: On Unified Stream Reasoning

MASTER STUDENTS (GRADUATED)

- 2023-12 Andrea Prati: Towards An Unsupervised Graph- Based Machine Learning Model For Lateral Movement Detection
- 2023-12 Talarico, Giulio: Optimizing Streaming Data Processing: Performance Analysis Of The Kappa Architecture In Open Source And Managed Cloud Environments
- 2023-12 Allam, Mohamed: Extending And Optimizing Streamdm-C++ Library For Efficient Streaming ML Algorithms On Microcontrollers
- 2023-10 Menconi, Stefania: Comparing Traditional And Streaming Machine Learning Methods For Soccer Pass Detection
- 2023-10 Sheshori, Ledio: Adbench: A Novel Benchmark For Streaming Anomaly Detection Algorithms
- 2023-10 Rescalli, Filippo: Improving Supply Chain Reliability: Integrating Borders And Customs Data For Eta Predictions
- 2023-05 Salazar Molina, Steven Alexander: Analyses Of Multi-Windowing Extension Approaches For The Streaming Virtual Knowledge Graph Tool Ontop-Stream
- 2022-12 Messori, Alessandro: Real Time Recommendations With Clickstream Data
- 2022-12 Dura, Franck Edmond Luc: Suitability Analysis Of The Raspberry Pi To Run Streaming Machine Learning Algorithms

- 2022-12 Bordoli, Aristide: Monitoring And Forecasting Of The Critical Parameters In Cleanrooms For The Manufacture Of Sterile Medicinal Products
- 2021-12 Pipita, Antonio: Dynamic Query Optimization In Spark
- 2021-12 Urbano, Antonio: Dozer, A Scalable And Fault-Tolerant Streaming Engine For Seraph Queries Evaluation
- 2021-10 Fedeli, Stefano: Privacy Preserving Survival Prediction With Graph Neural Networks
- 2021-07 Micheli, Giacomo: Plot Me : Alexa Per La Data Visualization
- 2021-06 Hypi, Xhimi: Leveraging Timely And Differential Dataflow For Efficient Rdfs Reasoning
- 2021-04 Enrico Voltan: A Comparative Study on Streaming Machine Learning Algorithms for Binary Classification Under Concept Drift and Class Imbalance
- 2020-12 Haritha Harikumar: A Scalable And Portable Approach To Building Iot Applications Using Open Source Technologies
- 2020-12 Luca Ferrera: A comparative study on parallelization of streaming top-k algorithms in Kafka
- 2020-10 Giacomo Ziffer: Incremental Naive Bayes with Kalman Filtering for Learning with Concept Drift
- 2020-10 Federico Piccini: Enhancing Fraud Detection Through Interpretable Machine Learning
- 2020-10 Luca Molteni: Dialogue self-play and crowdsourcing to collect annotated data for a chatbot
- 2020-10 Anna Martignano: Real-time anomaly detection on financial data
- 2020-04 Samuele Langhi: Towards Extream Processing with KEPLr
- 2019-12 Hosseinimotlagh Seyedmasih: Robust Adaptive Learning of Data Streams in Real Time Using Distributed Systems
- 2019-04 Scorsolini Philippe: An infrastructural view of cascading stream reasoning using micro-services
- 2019-04 Bernardo Alessio: Towards a benchmarking environment for streaming machine learning
- 2018-12 Scrocca Mario: Towards Observability with (RDF) Trace Streaming Processing
- 2018-10 Alasgarov Eldar: An experience in developing a scalable web application for reporting in real estate industry
- 2018-07 Abosedira Yehia Mohamed Ali Ahmed: Towards Streaming Data on the Web: Vocabularies, Catalogs and Applications
- 2017-04 Alessandro Donini: Una comparazione tra tecniche tradizionali e innovative di Data Visualization
- 2017-04 Blertan Libusha: Data Analytics of Milano Design Week 2016 Collected Using the Official Mobile App
- 2016-09 Farimah Fanaei: The power of time window in predicting hashtags while typing a tweet
- 2016-04 Marco Tagliabue: Lexicon-Based Domain-Agnostic Multilingual Sentiment Analytics as a Service
- 2015-04 Riccardo Tommasini: Heaven: supporting systematic comparative research of RDF stream processing engines
- 2014-10 Christian Marazzi, Andrea Mauri: Towards a tool set for social media analytics able to represent and anticipate the real world
- 2014-10 Luis Alberto Bonilla Leon: Implementing location based games with a purpose. The Urbanopoly Web case
- 2014-10 Soheil Behnam Roudsari, Kourosh Sheykhvand: Land use identification using mobile phone data
- 2014-04 Claudio Caletti: Ontology matching enhanced with similarity measures for georeferenced datasets
- 2014-04 Gloria Re Calegari, Gioele Nasi: CSE LiVeTweet analyser : a system for generating links between Venues and Tweets during city scale events
- 2014-04 Sara Habil Amirkhiz: An experience on error awareness and recovery in an energy distribution data management system : design, implementation and verification
- 2013-12 Roberto Gualandris: WikiFinder : un game with a purpose per lo studio della popolarità di linked data
- 2013-10 Antonella Di Rienzo: Data Linking as a side effect of game playing
- 2013-10 Mona Naseri: Automating Processes in Clarity PPM by Gel Scripting
- 2013-10 Andrea Pozzetti and Lorenzo Onofrio: Un Centro Commerciale Naturale 2.0: un'esperienza su Como
- 2013-10 Shima Zahmatkesh: Towards A Top-K Sparql Query Benchmark Generator
- 2012-12 Sivakumar Ramachandran: GIS to virtual RDF graphs (G2R)
- 2012-12 Attilio Fiumano: Sviluppo di applicazioni mobile cross-platform con Apache Cordova: Il caso di Urbanopoly
- 2012-04 Federico Caimi: Ontology And Instance Matching For The Linked Open Data Cloud

- 2012-03 Stefano Fumeo and Simone Contessa: Linking and Improving Linked Urban Data with Games with a Purpose
- 2011-12 Dragan Lesic: Developing graphical user interface for LDA architecture
- 2011-08 Chris Dijkshoorn and Bas Groenewoud: Semantic Web Empowered City Trip Planning
- 2011-07 Marco Balduini and Mirko Bratomi: SLD4SM : un ambiente integrato per la gestione di Stream di Social Media tramite Linked Data
- 2011-03 Adil Nausherwan: Streaming Linked Data
- 2011-03 Geatano Niro: Punti di forza e debolezze nello sviluppo di applicazioni del Semantic Web
- 2011-03 S. Magliacane: Towards A Rank-Aware Execution Of Top-K Sparql Queries
- 2011-12 ASP project supervision: The Social Computer for Milano and Torino (TSC@MITO)
- 2010-12 ASP project supervision: Urban Computing for Milano and Torino (UC@MITO)
- 2010-09 Hafiz Muhammad Qasim: Towards Treating GIS as Virtual RDF Graphs
- 2010-06 Marco Ragaldo: Traduzione automatica di interrogazioni Continuous-SPARQL su stream RDF in EPL e SPARQL
- 2010-04 Hadi-Choueiry: OpenStreetMap Recursive Street Extraction
- 2010-04 Catalina Mancas: An Empirical Study about the Impact of the Semantic Technologies upon the Software Development Lifecycle
- 2008-10 Daniele Dell’Aglia: Investigation on the convergence between Web 2.0 and Semantic Web
- 2008-7 Walter Corno: Intermediate Object-Oriented Layer to expose pre-existing Data Sources as SPARQL Endpoints
- 2006-6 A. Turati: PAGE: A Distributed Infrastructure for Fostering RDF-Based Interoperability

4.14. INNOVATION PROJECTS

- 10-2023/12-2024 **Progettazione e sviluppo di un framework per analisi predittive sugli asset con l'utilizzo di ontologie e tecniche di big data streaming semantico** (buyer: Ricerca sul Sistema Energetico S.p.A.)
- 9-2021/11-2022 **Ontologie multi energy e big data streaming semantico** (buyer: Ricerca sul Sistema Energetico S.p.A.) OntopStream, a Stream Reasoning solution that extends the Virtual Knowledge Graph approach to data streams.
- 9-2018/11-2018 **Spark2Sparql and back** (buyer: Ricerca sul Sistema Energetico S.p.A.) design, develop, test and deploy two components that allows spark to read RDF data from SPARQL end-points and a federated SPARQL engine to query SparkSQL as a virtual RDF graph via Ontop.
- 9-2017/11-2017 **Smart Grid Data Analytics** (buyer: Ricerca sul Sistema Energetico S.p.A.) design, develop, test and deploy a Big Data Science solution to analyze and predict Smart Grid Data collected by multiple company that owns and manage energy distribution networks.
- 1-2015/6-2015 **Oggi in Vetrina** (buyer: Como Municipality) developed of a multi-platform mobile app that extends the offer of ShopInComo. The new app informs tourists and citizens of offers launched by Como shops. If a user is interest in an offer, the app allows to open the ShopInComo app to learn more about the shop that offers it.
- 1-2015/6-2015 **CoVadis** (buyer: Como Municipality) developed of a multi-platform mobile app and to inform drivers of the availability of parking lots in Como parking silos and start a GPS navigator on the phone to guide them. The app alerts the driver when the chosen parking silo is running out of lots, so that the driver may decide to go to another parking silo.
- 1-2014/6-2014 **ShopInComo** (buyer: Como Municipality) developed a multi-platform mobile app and a Web site² to inform tourists and citizens about the shops available in Como. The app is available on the iOS³, Android⁴ and Windows phone market.
- 5-2013/12-2014 **CitySensing** (buyer: Telecom Italia) developed a post-hoc dashboard for visually analysing city scale events by fusing mobile telecommunication and social media data streams. He applied his research results on social media analytics using the Streaming Linked Data framework and supervised the service side development of the dashboard.

² <http://shopincomo.comune.como.it/>

³ <https://itunes.apple.com/us/app/shopincomo/id886182483?mt=8>

⁴ <https://play.google.com/store/apps/developer?id=shopincomo>

10-2011/3-2012	UrbanMatch (buyer: SIEMENS) a Game with a Purpose to experiment with crowdsourcing techniques whose incentives are tailored to urban lifestyles and needs. He conceived the Urban Match game and formalized the problem as a record linkage problem.
11-2005/2–2006	Squiggle Ski (buyer: Comitato Olimpico Torino 2006) a semantic search engine of athletes images (http://squiggle.cefried.it/ski/). He acted as Project Manager.
6-2005/1-2006	ZappoTV goes Semantics (buye: Alcatel) the design and implementation of the semantic extension of a multimedia search engine. He acted as Project Manager and designed the core of Squiggle (CEFRIEL's Semantic Search engine).
3-2004/5-2004	definizione dei Livelli di Servizio per email regionale in gestione a Lombardia Informatica s.p.a (buyer: Lombardia Informatica s.p.a.) He acted as Project Manager and contributor.
10-2003/4-2004	definizione dei Livelli di Servizio per Nuova Anagrafe regionale in gestione a Lombardia Informatica s.p.a. (buyer: Lombardia Informatica s.p.a.) He acted as Project Manager and contributor.
7-2003/10-2003	studio di visione strategica del Sistema Informativo Agricolo Regione Lombardia (buyer: Regione Lombardia) He acted as Project Manager and contributor.
3-2003/7-2003	definizione di una metodologia per i Livelli di Servizio per gli applicativi di Regione Lombardia in gestione a Lombardia Informatica s.p.a. (buyer: Lombardia Informatica s.p.a.) He acted as Project Manager and contributor.
9-2002/1-2003	Studio di fattibilità per la realizzazione di un sistema documentale per il Ministero dell'Economia e delle Finanze. (buyer: SOGEI). Emanuele was the major contributor to the feasibility study.
1-2002/6-2002	Regione Lombardia intranet portal (buyer: Regione Lombardia). He acted as Project Manager, solution architect and developer.
2-2002/5-2002	linee guida per l'evoluzione della soluzione di protocollo informatico del ministero del Tesoro (buyer: SOGEI). Emanuele was the major contributor to the document.
10-2001/12-2001	Regione Lombardia intranet portal feasibility study (buyer: Regione Lombardia) Emanuele was the major contributor to the feasibility study.
6-2001/10-2001	Studio per l'Evoluzione in ottica CRM per l'assistenza agli utenti del sistema informativo del ministero delle finanze (buyer: SOGEI) Emanuele was the major contributor to the document.
5-2001/6-2001	Studio di fattibilità del portale internet della Regione Lombardia (buyer: Regione Lombardia) Emanuele was the one of the contributors to the feasibility study.

5. FULL LIST OF PUBLICATIONS

5.1. ACCEPTED BOOKS

- [b6] Emanuele Della Valle, Federico Giannini, Riccardo Tommasini: Streaming Artificial Intelligence. Springer, Data-Centric Systems and Applications. TO APPEAR in 2027

5.2. 2026

- [j32] Federico Giannini, Giacomo Ziffer, Emanuele Della Valle: Dynamic continuous progressive neural networks for evolving streaming time series. *Data Min. Knowl. Discov.* 40(4): 49 (2026)
- [j31] Andrea Cossu, Federico Giannini, Giacomo Ziffer, Alessio Bernardo, Alexander Gepperth, Emanuele Della Valle, Barbara Hammer, Davide Bacciu: A practical guide to streaming continual learning. *Neurocomputing* 674: 132951 (2026)
- [c141] Antonio De Santis, Marco Balduini, Matteo Belcao, Andrea Proia, Marco Brambilla, Emanuele Della Valle: LLM-Enhanced Semantic Data Integration of Electronic Component Qualifications in the Aerospace Domain. *ESWC* (2) 2026: 398-415
- [c140] Lorenzo Iovine, Giacomo Ziffer, Emanuele Della Valle: Tracking Adaptation Time: Metrics for Temporal Distribution Shift. *StreamingCL@AAAI* 2026
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5.25. PATENT

S. Ceri, D. Braga, M. Brambilla, A. Campi, E. Della Valle, P. Fraternali, D. Martinenghi, M. Tagliasacchi. Method for extracting, merging and ranking search engine results. Patented in Italy and USA.

- autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base all'art. 13 del GDPR 679/16

- il sottoscritto, Emanuele Della Valle, consapevole delle sanzioni penali previste dall'art. 76 T.U. N. 445 del 28.12.2000 sulle disposizioni legislative e regolamentari in materia di documentazione amministrativa nel caso di mendaci dichiarazioni o esibizione di atti falsi o contenenti dati non rispondenti a verità, dichiara sotto la propria responsabilità che quanto sopra riportato risponde a verità.

Milano, 01-10-2026