

Francesco Osborne, PhD

Curriculum Vitae – 2024

EXECUTIVE SUMMARY

I am a Senior Research Fellow at the Knowledge Media Institute of The Open University (UK) where I lead the Scholarly Knowledge Mining (SKM) team (<http://skm.kmi.open.ac.uk/>). My primary research interests cover Artificial Intelligence, Information Extraction, Knowledge Graphs, Natural Language Processing, and Research Analytics. Application domains include scientific research, media analysis, big data, financial market analysis, education, astronomy, and tourism. Recently, I have been exploring the intersection of generative AI and semantic technologies, aiming to create advanced systems for scientific exploration, horizon scanning, research hypothesis generation, and the automated production of literature reviews.

I have contributed, either as PI, Co-I, or Technical Director to bringing in over £1.3M in funding to the SKM team, including cash and in-kind support from the top two commercial academic publishers in the world, Elsevier and Springer Nature.

I have authored over 140 peer-reviewed publications in top-tier journals and conferences within AI and semantic technologies, including Artificial Intelligence Review, Neurocomputing, Future Generation Computer Systems, Knowledge-Based Systems, Engineering Applications of Artificial Intelligence, Technological Forecasting and Social Change, the Semantic Web Journal, ISWC, ESWC, and WebConf. I have been recognized with several awards, including the Best In-Use Paper Award at the International Semantic Web Conference 2022, the Best Demo Award at the International Semantic Web Conference 2020, and the Semantic Publishing Award at the European Semantic Web Conference 2014.

I regularly organize scientific events and special issues. Most recently, I chaired the Industry Track at ISWC 2024, the Poster and Demo Track at SEMANTICS 2024, the Workshop on Scientific Knowledge (Sci-K at TheWebConf 2023), the Workshop on Deep Learning for Knowledge Graphs (DL4KG at ISWC 2023), and acted as guest editor for a special issue of the Semantic Web Journal. I am a member of the Editorial Board of the Journal of Web Semantics and the Data Intelligence Journal.

I collaborate with a number of commercial organizations (e.g., Springer Nature, Elsevier, Microsoft, Digital Science), non-profit organizations (e.g., OECD, CSET, FBK), and universities (e.g., Paris 13, Cagliari, Milano-Bicocca, Bologna, Trento, Karlsruhe Institute of Technology, Oxford, Vienna, Georgetown, Amsterdam, Tokyo, and others). I am a Visiting Research Fellow at the Sorbonne Paris North University, and I am regularly invited to present my research at universities (e.g., Vienna, Cagliari) and other organizations (e.g., Springer Nature, Chan Zuckerberg Initiative, OECD, CSET).

The techniques and software solutions produced by my team have been highly influential in this space. I created the *Computer Science Ontology* (CSO, <http://cso.kmi.open.ac.uk>), a taxonomy of research topics which is an order of magnitude bigger than the most widely used alternative, the ACM Computing Classification, and has been adopted by Springer Nature (<https://tinyurl.com/y5c92bxz>) and several other organizations for annotating scientific documents and educational material. Building on this work, I designed the *Smart Topic Miner*, a tool for automatically annotating scientific publications that has been in routine use at Springer Nature since 2016. This solution brought a 75% cost reduction and dramatically improved the quality of the annotations, resulting in 12M additional downloads from the SpringerLink portal.

More recently, my research has focused on the automatic generation of large-scale knowledge graphs. In 2020, we produced the *Academia/Industry DynAmics (AIDA) Knowledge Graph* (<http://w3id.org/aida>), a knowledge graph that maps 25M publications and 8M patents to the relevant research topics and industrial sectors. In 2022, we released the *Computer Science Knowledge Graph* (<http://w3id.org/cskg>), a knowledge base that describes 25M methods, tasks, materials, and metrics automatically extracted from computer science articles.

Recently, we published a highly influential [survey paper on knowledge graphs](#) and an in-depth analysis of [AI systems for automated literature reviews](#).

1 HIGHER EDUCATION

Degrees

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|------|---|
| 2015 | PhD in Computer Science from the University of Torino, Italy. |
| 2010 | Master's Degree in Communication Sciences from the University of Torino, Italy. |

2 APPOINTMENTS AND EXPERIENCE

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|-----------|--|
| 2022-now | Senior Research Fellow at the Knowledge Media Institute of the Open University in Milton Keynes, UK. |
| 2020-2022 | Research Fellow (Permanent) at the Knowledge Media Institute of the Open University in Milton Keynes, UK. |
| 2018-2022 | Visiting Research Fellow at Sorbonne Paris North University, France. |
| 2017-2020 | Research Fellow (Fixed Term) at the Knowledge Media Institute of The Open University in Milton Keynes, UK. |
| 2015-2017 | Research Associate at the Knowledge Media Institute of The Open University in Milton Keynes, UK. |
| 2013-2014 | Research Assistant at the Knowledge Media Institute of The Open University in Milton Keynes, UK. |
| 2011-2012 | Visiting PhD Student at the Knowledge Media Institute of The Open University in Milton Keynes, UK. |

3 CONTRIBUTIONS TO TEACHING AND STUDENT SUPPORT

I do not have official teaching duties at The Open University. I support several students at different levels in the context of our collaborations with the University of Cagliari, the University of Bologna, and the University of Milano Bicocca.

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|-----------|---|
| 2022-2023 | Supervising the generation of machine learning models for the automatic generation of metadata from online courses in the context of the VocTeach projects. |
| 2020-now | Co-supervising students for the Big Data and Machine Learning courses of the University of Cagliari. |
| 2020-2021 | Co-designed the prototype of the 'AI Module Guru', an innovative chatbot able to answer student questions about a course. |
| 2015-now | Regularly supervising master students in the context of internships and the Erasmus programme (see Section 4 of the CV). |
| 2011-2013 | Teaching assistant for the courses of Web Programming and Digital Literacy at the Faculty of Literature and Philosophy, University of Torino. |
| 2006-2008 | Tutor for the course of digital journalism at the Faculty of Literature and Philosophy, University of Torino. |

4 CONTRIBUTIONS TO ADMINISTRATION AND MANAGEMENT

I lead the Scholarly Knowledge Mining team. Since 2013, I have supervised/line managed several researchers/students/developers.

Line Manager of:

2019-now	Angelo Salatino (Research Associate and Associate Lecturer)
2017-2019	Thiviyan Thanapalasingam (Research Assistant), now PhD Student at the University of Amsterdam, Netherlands

Team Manager of:

2023	Pablo Sánchez Núñez (Visiting Researcher - Charles III University of Madrid)
2023-2024	Simone Angioni (Visiting Researcher - University of Cagliari, Italy)
2022-2023	Linda Andersson (Developer)
2021	Alessio Toscano (Developer)
2018-2019	Hakan Ezgi Kızılöz (Visiting Researcher - Ankara University), now Technical Solutions Consultant at Google, UK
2017-2019	Andrea Mannocci (Research Associate), now Research Associate (Permanent) at the National Research Council of Italy, Italy
2016-2017	Patrick Wang (Research Associate), now Associate Professor at ISEP, France
2016-2017	Carlo Allocca (Research Associate), now Data Scientist at Samsung, UK
2016	Aswin Sundaram (Developer)
2015-2016	Helene de Ribaupierre (Research Associate), now Knowledge Graph Engineer at Frontiers, UK
2015-2016	Giorgio Basile (Research Assistant), now Software Engineer at Planetek, Italy

Selected Master Student Supervision:

2022- 2023	Marco Murgia (Visiting Master Student from the University of Cagliari, Italy)
2022- 2023	Maia Lunde Gjelsvik (Visiting Master Student from University of Bergen, Norway)
2021	Antonello Meloni (Visiting Master Student from the University of Cagliari, Italy), now PhD Student at the University of Cagliari, Italy
2020-2021	Mirco Serra (Visiting Master Student from the University of Cagliari, Italy), now Data Scientist at K2 Energy, Italy
2019-2021	Simone Angioni (Visiting Master Student from the University of Cagliari, Italy), now PhD Student at the University of Cagliari
2018	Salvatore Zagaria (Visiting Master Student from the University of Bari, Italy), now Software Engineer at Avail AI, UK
2013-2014	Giuseppe Scavo (Visiting Master Student from the Polytechnic University of Bari, Italy), now Head of Development at Draw & Code, UK

5 RESEARCH AND SCHOLARSHIP

Research Interests

Current research interests include Information Extraction, Knowledge Graph Generation, Large Language Models, Research Analytics, Science of Science, Open Science, Artificial Intelligence, Knowledge Engineering, Semantic Web, and Semantic Publishing.

Awards

- 2023 Most Influential Scholar Award – Honourable Mention (AI2000 2023), **Top 20** Worldwide Researcher in Knowledge Engineering - the Artificial Intelligence 2000 Most Influential Scholar List. Rank based on citations in the top venues of Knowledge Engineering and Semantic Technologies.
- 2022 Best In-Use Paper Award at the International Semantic Web Conference 2022, the top venue in the field of Semantic Web and Knowledge Graphs, attended by over 800 participants.
- 2022 Most Influential Scholar Award – Honourable Mention (AI2000 2022), **Top 20** Worldwide Researcher in Knowledge Engineering - the Artificial Intelligence 2000 Most Influential Scholar List. Rank based on citations in the top venues of Knowledge Engineering and Semantic Technologies.
- 2021 Most Influential Scholar Award – Honourable Mention (AI2000 2021), **Top 25** Worldwide Researcher in Knowledge Engineering - the Artificial Intelligence 2000 Most Influential Scholar List (<http://kmi.open.ac.uk/news/article/19706>).
- 2020 Best Demo Award at the International Semantic Web Conference (ISWC 2020), the most important venue in the field of Semantic Web, attended by over 800 participants.
- 2020 DataIQ Award Nominee 2020. The DataIQ Awards honours companies and individuals that have demonstrated excellence in the data industry.
- 2020 Finalist at the Springer Nature Innovation Competition 2020.
- 2019 Best Paper Award Nominee for three different papers at the International Semantic Web Conference (ISWC 2020) in the tracks: In-use, Demo, and Poster.
- 2019 Best Paper Award Nominee at TPDL 2019, top venue in the field of Digital Library attended by over 400 participants. The relevant paper is currently the most cited in TPDL since 2015.
- 2018 Best Paper Award Nominee at the International Semantic Web Conference (ISWC 2018), Resources track.
- 2018 Best Paper Award at SAVE-SD 2018.
- 2014 1st prize at the Semantic Publishing Challenge at the European Semantic Web Conference (ESWC 2014), the second the most important venue in the field of Semantic Web, attended by over 500 participants. The Semantic Publishing Challenge compared applications using semantic technologies from several universities worldwide. I won it with Rexplore [58], an innovative system that uses AI and semantic technologies for analysing research data.
- 2014 Best Paper Award Nominee at European Semantic Web Conference (ESWC 2014).
- 2011 Best Paper Award Nominee at the International Conference on Interactive Digital Storytelling (ICIDS 2011), the top conference in Digital Storytelling.

2011 Best Project Award at SSSW 2011, which was the main summer school in the field of Semantic Web.

Research funding

2024-2027 **Using Deep Learning to improve Euclid data analysis – Co-I.** This project aims to develop innovative artificial intelligence methods for monitoring and correcting radiation damage in space telescopes within the framework of the Euclid mission. The grant supports a doctoral student, David Krejčík, who is co-supervised in collaboration with the Astronomy Department.

Funder: Science and Technology Facilities Council (STFC) - DISCnet PhD projects

Grant: £123K for 100% of the PhD studentship

2024-2026 **Intelligent technologies to support editorial strategies at Springer Nature II – Co-I and Technical Director.** The project aims to continue the design and development of AI intelligent services for assisting Springer Nature workflow, predicting research dynamics, and informing editorial and marketing decisions.

Funder: Springer Nature

Grant: £150K (for the OU)

2022 **VocTeach: National Educational Content Aggregator – Work package Leader.** This project aimed to design and deliver a prototype of an online platform that will enable vocational teaching practitioners to access and share resources, including curriculum-relevant content, useful for their blended teaching needs and interests, via the creation of a new FE online platform: the FE Aggregator.

Funder: Ufi, Jisc

Grant: £324K grant and £345K in kind (for the OU)

2021-2023 **Intelligent technologies to support editorial strategies at Springer Nature – Co-I and Technical Director.** The project aimed at designing several intelligent services for assisting Springer Nature workflow, predicting research dynamics, and informing editorial and marketing decisions.

Funder: Springer Nature

Grant: £165K (for the OU)

2020 **Exploiting KMi's scholarly analytics research to generate new sponsorship opportunities in Life Science – Co-I and Technical Director.** The main aim of this project was to support the migration of our scholarly analytics technologies to the Life Science domain in order to open up new exploitation opportunities in this area.

Funder: HEIF Grant.

Grant: £38K (for the OU)

2019-2020 **Intelligent technologies to support editorial strategies and marketing campaigns at Springer Nature – Co-I and Technical Director.** The project aimed at developing novel intelligent technologies for automatically evaluating the quality of scientific conferences and informing editorial decisions. A significant outcome was the

development of novel technologies for characterising corporate clients according to their research interests, acquiring a better understanding of the relationship between academy and industry, and producing tailored packages of editorial products.

Funder: Springer Nature

Grant: £100K (for the OU)

2018-2019 **Supporting Editorial Activities at Springer Nature – Co-I and Technical Director.** The project aimed at fostering Springer Nature editorial activities by supporting them with a variety of smart solutions leveraging artificial intelligence, data mining, and semantic technologies.

Funder: Springer Nature

Grant: £65K (for the OU)

2016-2018 **Developing Semantic Technologies at Springer Nature – Co-I and Technical Director.** This project created Smart Topic Miner, the system which is now routinely used to assist Springer Nature editors in classifying conference proceedings, and Smart Book Recommender, an ontology-based recommender system for selecting the best editorial products to market at specific venues.

Funder: Springer Nature

Grant: £50K (for the OU)

2014-2017 **Automatic Detection of Research Trends – Supervisor.** This grant funded the PhD of Angelo Salatino, who developed a novel approach to forecasting the emergence of new research topics.

Funder: Springer Nature

Grant: £60K for the PhD studentship

2014-2017 **Rexplore – Technical Director.** The project developed innovative services for exploring and making sense of scholarly data, using large-scale data mining, machine learning and semantic technologies. I led the research and development activities of the team working on the project.

Funder: Springer Nature, Elsevier, and The Open University (HEIF fund).

Grant: £400K combined funding in cash and kind for the OU.

6 POSTGRADUATE STUDENT SUPERVISION

2024-now Co-Supervisor of David Krejčík (The Open University, UK). Working on developing new artificial intelligence methods to monitor and correct radiation damage in space telescopes (in the context of the Euclid mission).

2024-now Co-Supervisor of Michael McCoubrey (The Open University, UK). Working on scientific hypothesis generation.

2023-now Co-Supervisor of Huy Hoang Le (University of Camerino, Italy). Working on analysing initial coin offerings.

2023-now Co-Supervisor of Marco Murgia (University of Cagliari, Italy). Working on AI methods for citation prediction.

2023-now	Co-Supervisor of Tanay Aggarwal (The Open University, UK). Working on AI methods for extracting scientific knowledge from the literature.
2023-now	Co-Supervisor of Alessia Pisu (University of Cagliari, Italy). Working on large language models for scholarly data.
2023-now	<i>Main Supervisor</i> of Francisco Bolaños (The Open University, UK). Working on computational methods for supporting literature reviews.
2021-now	Co-Supervisor of Vincenzo De Leo (University of Cagliari, Italy). Working on ontologies for big data.
2021-now	Co-Supervisor of Antonello Meloni (University of Cagliari, Italy). Working on conversational agents.
2021-2023	Co-Supervisor of Agustín Borrego (University of Seville, Spain). Working on knowledge graph completion and hypothesis generation.
2021-2023	Co-Supervisor of Luca Secchi (University of Cagliari, Italy), now Chief Scientist at Linkalab. Working on knowledge graph generation.
2021-2023	Co-Supervisor of Simone Angioni (University of Cagliari, Italy), now Researcher at the University of Cagliari, Italy. Working on science of science and bibliometrics.
2018-2020	Co-Supervisor of Danilo Dessì (University of Cagliari, Italy), now Senior Researcher at the GESIS Leibniz Institute for the Social Sciences.
2015-2019	Main Supervisor of Angelo Salatino (The Open University, UK), now Research Fellow at The Open University, UK.
2015	Co-Supervisor of Catia Prandi (University of Bologna, Italy), now Senior Assistant Professor at the University of Bologna, Italy.

7 EXTERNAL ACADEMIC ACTIVITIES

Membership of Government or other public committees

2023-now	Knowledge Graph interest group of the Alan Turing institute (https://www.turing.ac.uk/research/interest-groups/knowledge-graphs). The primary goals of the interest group include strengthening a national community of scholars and innovators for the pursuit of world-leading research and exploring new technologies in the realm of Knowledge Graphs. Additionally, the group aims to reinforce the systematic use of KGs in practical data science and AI applications, and to identify a range of joint research projects suitable for current and future postgraduate students.
2020-now	Knowledge Graph Construction W3C Community Group. We are creating the new W3C standards and tools for supporting the creation of knowledge graphs from heterogeneous big data sources. Specifically, I am contributing to the creation of new techniques and benchmarks for automatically generating knowledge graphs from documents (e.g., http://w3id.org/aida , http://w3id.org/aikg).
2017-2019	Member of the Organisation for Economic Co-operation and Development (OECD) Expert Advisory Group. I provided new tools for performing large-scale analyses of research trends and technologies, with the aim of informing decisions on funding allocation. I also instructed members of OECD about recent AI technologies for horizon scanning. See for example the workshop report at https://tinyurl.com/22jm2xyc .

External PhD Examinations

2024	External Examiner of Michele De Bonis (University of Pisa, Italy).
2023	External Examiner of Agustin Borrego (University of Seville, Spain).
2022	External Examiner of Claudio Pomo (Polytechnic University of Bari, Italy).
2021	External Examiner of Carlos Badenes-Olmedo (Technical University of Madrid, Spain).
2020	External Examiner of Giuseppe Futia (Polytechnic University of Turin, Italy).
2019	External Examiner of Danilo Dessì (University of Cagliari, Italy).
2017	External Examiner of Dario De Nart (University of Udine, Italy).

Member of PhD VIVA Committee

2024	Member of PhD VIVA Committee for Eva Almansa, Claudio Crobu, Roberta Galici, Giacomo Medda, and Armando Sanchez Alcázar (University of Cagliari, Italy).
2023	Member of PhD VIVA Committee for Zixiu Wu (University of Cagliari, Italy).

Internal PhD Examinations

2022	Internal examiner for 1st year PhD VIVA of Audrey Ekuban (The Open University, UK).
2021	Internal examiner for 1st year PhD VIVA of Paula Reyero-Lobo (The Open University, UK).
2020	Internal examiner for 1st year PhD VIVA of Kai Waddington (The Open University, UK).
2019	Internal examiner for 1st year PhD VIVA of Zeeshan Jan (The Open University, UK).

Academic editorial work

2023-now	Associate Editors of the Journal of Web Semantics
2023	Co-editor of Semantic Web Journal special issue on Knowledge Graph Generation from Text.
2023	Co-editor of Electronics special issue on Advances in Artificial Intelligent Systems for the Scholarly Domain.
2022	Co-editor of Quantitative Science Studies special issue on Scientific Knowledge: Representation, Discovery, and Assessment.
2022	Co-editor of Semantic Web Journal special issue on Deep Learning for Knowledge Graphs.
2021-now	Editorial Board Member of Scholarly Communication (Frontiers in Research Metrics and Analytics).
2020	Co-editor of Data Science special issue on Scholarly Data Analysis.
2019-now	Editorial Board Member of the Data Intelligence Journal (MIT Press and Chinese Academy of Sciences)
2018	Co-editor of Semantics, Analytics, Visualization: Enhancing Scholarly Data. 3rd and 4 th International Workshop (LNCS Vol. 10959). Springer Nature.
2018	Co-editor of Proceedings of the EKAW Doctoral Consortium 2018. CEUR Workshop Proceedings 2306.

2017 Co-editor of Semantics, Analytics, Visualization: Enhancing Scholarly Data. (LNCS Vol. 9792). Springer Nature.

Contributions to conferences

2024 Co-chair of the Industry Track and Job Fair at ISWC 2024

2024 Co-chair of the Poster & Demo Track at SEMANTICS 2024.

2024 Co-chair of the Workshop on Deep Learning for Knowledge Graphs (DL4KG) at KDD.

2024 Co-chair of the Retrieval-Augmented Generation enabled by Knowledge Graphs at ISWC 2024.

2024 Co-chair of the International Workshop on Scientific Knowledge Representation, Discovery, and Assessment (Sci-K) at ISWC 2024.

2024 Co-chair of the International Workshop on Knowledge Graph Generation from Text (Text2KG) at ESWC 2024.

2023-2024 Co-chair of the International Workshop on Semantic Technologies for Scientific, Technical, and Legal Data (SemTech4STLD) at ESWC 2024.

2023 Co-chair of the International Workshop on Scientific Knowledge: Representation, Discovery, and Assessment (Sci-K) at TheWebConf 2023.

2023 Co-chair of the International Workshop on Knowledge Graph Generation from Text (Text2KG) at ESWC 2023

2023 Co-chair of the International Workshop on Semantic Technologies for Scientific, Technical and Legal Data at ESWC 2023

2022-2023 Co-chair of the International Workshop on Scientific Knowledge: Representation, Discovery, and Assessment (Sci-K) at TheWebConf

2022-2024 Co-chair of the International Workshop on Knowledge Graph Generation from Text (Text2KG) at ESWC

2022 Co-chair of the Special Track for Advanced Representation of Scholarly Knowledge (ASK) at the 26th International Conference on Science, Technology and Innovation Indicators, STI 2022

2022 Publicity Co-Chair of ICWE 2022

2022 Co-chair of the Knowledge Graphs Track at SAC 2022.

2021-2023 Co-chair of the Workshop on Deep Learning for Knowledge Graphs (DL4KG) at ISWC.

2021 Co-chair of the International Workshop on Scientific Knowledge Representation, Discovery, and Assessment (Sci-K) at The Web Conf 2021.

2020 Co-chair of the Science of Science Track at ESWC.

2020 Co-chair of the Scientific Knowledge Graph Workshop at TPDL 2020.

2020 Co-chair of Reframing Research (RefResh) Workshop at SOCINFO 2020

2019-2020 Co-chair of Workshop on Deep Learning for Knowledge Graphs (DL4KG) at ESWC.

2019 Co-chair of the Research of Research Track at ESWC.

2019 Co-chair of Data Science special issue (extended papers of the SAVE-SD Workshop)

2018 Co-chair of the Doctoral consortium at EKAU 2018.

2018 Co-chair of Reframing Research (RefResh) Workshop at EUROCCS Symposium.

- 2017 Co-chair of Scientometrics Workshop (Scientometrics 2017 at ESWC).
- 2015-2018 Co-chair of “Semantics, Analytics, Visualisation: Enhancing Scholarly Dissemination” Workshop (SAVE-SD 2015-2018 at WWW).

Selected invited talks and lectures

- 2024 “Integrating Large Language Models with Scientific Knowledge Graphs: Trends and Future Directions”, keynote at the 1st International Workshop on Natural Scientific Language Processing at the Extended Semantic Web Conference 2024 (ESWC 2024). Hersonissos, Crete, Greece.
- 2023 “Knowledge Graphs for Scientific Discovery: Opportunities and Challenges”, invited talk at SEMANTICS 2023, the premier conference bridging academia and industry in the realm of semantic technologies. Leipzig, Germany.
- 2023 “Ethic and sustainability in AI”, invited talk at the University of Milan-Bicocca, online.
- 2023 “The AIDA Dashboard: a web application for assessing and comparing scientific conferences”, invited talk at Springer Nature, Heidelberg, Germany.
- 2022 “AI-Based Solutions for Scientific Publishing”, invited talk at Springer Nature, online.
- 2022 “Scientific Knowledge Graphs: leveraging AI for exploring and interlinking research knowledge”, invited talk at Coventry University, UK.
- 2021 “Information Extraction for Knowledge Graph Generation”, panelist talk at Workshop on Entity and Dataset Linking in Scientific Texts 2021, online (due to COVID-19).
- 2021 “Automatic Generation of Knowledge Graphs for Open Science”, keynote at Data Intelligence and Knowledge Service Conference 2021, online (due to COVID-19).
- 2021 “The Generation of Scientific Knowledge Graphs”, panelist talk at Second International Workshop on Knowledge Graph Construction at ESWC 2021, online (due to COVID-19).
- 2020 “Monitoring and Predicting the Impact of Scientific Conferences” at AI day of the Holtzbrinck Publishing Group, online (due to COVID-19).
- 2019 “Understanding Research Data with Semantic Technologies” at Paris 13 University, 2019, Paris, France.
- 2019 “Smart Topics Miner 2: Improving Proceedings Retrievability,” at Springer Nature, 2019, Heidelberg, Germany.
- 2018 “Analysing large-scale Research Data with Semantic Technologies” at Chan Zuckerberg Initiative, 2018, Palo Alto, California, USA.
- 2018 “Explore large-scale Research Data with Semantic Technologies”, keynote at BigScholar 2018, KDD 2018, London, UK.
- 2018 “Analysing large-scale Research Data with Semantic Technologies” at Paris 13 University, 2018, Paris, France.
- 2018 “The Computer Science Ontology” at Springer Nature Hackday 2018, Berlin, Germany.
- 2018 “Understanding Research with Semantic Technologies” at Workshop on Semantic analysis for innovation policy (OECD) 2018, Paris, France.

- 2017 “Research 3.0: integrating knowledge graphs in the research process”, keynote at Workshop on Extracting and Modelling Scientific Knowledge from Texts. IC 2017, Caen, France
- 2016 “Two roads to Semantic Publishing” at Workshop on Semantic Publishing. FORCE 2016, Portland, Oregon.

8 OTHER INFORMATION

Skills

Software Engineering: Software Development, Project Management, UML.

Programming and markup languages: Python, PHP, Java, Javascript, Unix shell scripts, Latex, XML, HTML.

Data Management: SQL, NoSQL, Graph Databases, PostgreSQL, MySQL, MongoDB.

Big Data: ElasticSearch, Hadoop, HBASE, Spark, Hive.

Operating Systems: Unix/Linux, Mac OS X, Microsoft Windows, Android.

Machine Learning and Deep Learning: TensorFlow, Keras, scikit-learn, pandas, gensim, scipy.

Semantic Web Technologies: RDF, OWL, SPARQL, triplestores, ontology engineering, ontology learning.

Recommender Systems: collaborative, content-based, ontology-based, hybrid.

NLP and Data Mining: large language models, transformers, topic modelling, named entity recognition, entity linking, information extraction, knowledge graph generation.

Program committees

WOSP 2014, WLT 2014, WOSP 2015, BigScholar 2015, VOILA 2015, BigScholar 2016, WOSP 2016, ISWC P&D 2016, VOILA 2016, EKAW 2016, Drift-a-LOD 2016, SWM 2017, BigScholar 2017, VOILA 2017, WWW 2017, WOSP 2017, ESWC 2017, ISWC 2017, K-CAP 2017, QEKGraph 2017, Drift-a-LOD'18, RefResh 2018, VOILA 2018, WWW 2018, ESWC 2018, ISWC 2018, EKAW 2018, BigScholar 2018, DL4KG 2019, TheWebConf 2019, ESWC 2019, ISWC 2019, CLiC-it 2019, K-CAP 2019, AML 2019, SemEx 2019, CIKM 2020, JIST-KG 2020, ESWC 2020, ECAI 2020, ISWC 2020 (senior), EKAW 2020, SEMEX 2020, CLiC-it 2020, WOSP 2020, IRCDL 2021, TheWebConf 2021, ESWC 2021 (senior), PDyRI'2021, IRCDL 2021, TheWebConf 2021, SEMANTiCS 2021 EU, ISWC 2021 (senior), KGCW 2021, SDP 2021, ACM SAC 2021, BiblioDAP 2021, SEMANTiCS 2021, K-CAP 2021, IJCKG 2021, ESWC 2022, ICWE 2022, TheWebConf 2022, CSCW 2022, TPD 2022, ISWC 2022 (senior), SEMANTiCS 2022, EKAW 2022, KGSWC 2023, K-CAP 2023, TheWebConf 2023 (senior), ESWC 2023 (senior), ISWC 2023 (senior), ESWC 2024 (senior), TheWebConf 2024.

Session chair

ISWC 2019, ECAI 2020, ISWC 2020, ISWC 2021, K-CAP 2021, TheWebConf 2022, ISWC 2022, ISWC 2023.

Reviewer

Journal of Web Semantics, Semantic Web Journal, International Journal of Human-Computer Studies, Data Intelligence, Data Science, Future Generation of Computer Systems, PeerJ Computer Science, Information Processing and Management, MethodsX, Journal of Computational Science, Mathematical Biosciences and Engineering, Computers in Industry, EPJ Data Science, Knowledge and Information Systems, Information Processing and Management, Cognitive Systems, SoftwareX, Automation in Construction, Scientific Data, International Journal of Intelligent Systems.

Project Reviewer

Croatian Science Foundation, Swiss National Science Foundation, French National Agency for Research (Foundation Agence nationale de la recherche), the CHIST-ERA consortium, the European Research Council (ERC).

Recent Technologies

Below I list the main software solutions designed and implemented by me or by my team under my supervision.

2022-now **Computer Science Knowledge Graph, CS-KG** (<http://w3id.org/cskg>): It is a large-scale automatically-generated knowledge graph describing 10M entities (e.g., tasks, methods, metrics, materials, others) according to 41M statements extracted from 6.7M articles in Computer Science.

2022-now **AIDA-Bot** (<https://w3id.org/aida/bot>): It is a conversational agent that can answer complex user questions about the scholarly domain.

2020-now **AIDA Conference Dashboard** (<https://aida.kmi.open.ac.uk/dashboard>): It is a tool developed in collaboration with Springer Nature for analysing and comparing conferences in Computer Science.

2020-now **Artificial Intelligence Knowledge Graph, AI-KG** (<http://w3id.org/aikg>): It is a large-scale automatically-generated knowledge graph that describes 850K entities (e.g., tasks, methods, metrics, materials, others) relevant to AI according to 1,2M statements extracted from 333K articles.

2020-now **Academia/Industry DynAmics Knowledge Graph, AIDA** (<http://w3id.org/aida>): It is an innovative resource for supporting large-scale analyses of research trends across academia and industry. It describes 21M publications and 8M patents according to the research topics drawn from the Computer Science Ontology, the type of the author's affiliations (e.g., academy, industry, collaborative), and 66 industrial sectors (e.g., automotive, financial, energy, electronics).

2019-now **CSO Classifier** (<https://github.com/angelosalatino/cso-classifier>): It is an unsupervised approach for automatically classifying research papers according to the Computer Science Ontology. The CSO Classifier takes as input the metadata associated with a research paper and returns a selection of research concepts drawn from the ontology. It is used by several universities and organizations for automatically annotating their research outputs.

2018-now **The Computer Science Ontology (CSO)** (<http://cso.kmi.open.ac.uk>): CSO is a large-scale, open, automatically generated ontology of research areas. It is the largest taxonomy in the field of Computer Science, including about 14K topics and over 162K relationships. I produced it by applying the Klink-2 algorithm on a very large dataset of 16M scientific articles. CSO powers several tools adopted by the editorial team at Springer Nature and is used to enable a variety of solutions, such as classifying research publications, detecting research communities, and predicting research trends.

2017-2020 **Smart Book Recommender** (<http://skm.kmi.open.ac.uk/sbr/>): A semantic application designed to support the Springer Nature editorial team in promoting their publications at Computer Science venues. It takes as input the proceedings of a conference and suggests books, journals, and other conference proceedings which are likely to be relevant to the attendees of the conference in question.

2016-now **Smart Topic Miner** (<http://stm-demo.kmi.open.ac.uk/>): A tool which uses Semantic Web technologies to classify scholarly publications on the basis of a very large automatically generated ontology of research areas. It was developed to support the Springer Nature Computer Science editorial team in classifying proceedings.

2015-2017 **Garden Monitor App** (<http://www.mksmart.org/gardenmonitor/>): A mobile application that uses machine learning techniques for generating a customized calendar advising users on how to water their garden in the following ten days.

2012-now **Klink-2** (<http://skm.kmi.open.ac.uk/klink-2>): An approach that takes as input large amounts of scholarly metadata and automatically generates an OWL ontology containing all the research areas mined from the input data and their semantic relationships.

2012-2017 **Rexplore** (<http://skm.kmi.open.ac.uk/rexplore>): A system that provides an innovative environment for analysing the research landscape and the performance of scientists, universities and scientific events.

9 PUBLICATIONS

Journal Articles

1. Salatino, A., **Osborne, F.**, and Motta, E. Does Diversity of Expertise Drive Citation Impact? Evidence from Computer Science. *Submitted to Scientometrics*.
2. Cadeddu, A., Chessa, A., De Leo, V., Fenu, G., Motta, E., **Osborne, F.**, Reforgiato Recupero, D., Salatino, A., and Secchi (2024) Identifying Sustainable Development Goals: A Comparative Study of Large Language Models for Text Classification. *Submitted to Engineering Applications of Artificial Intelligence*.
3. Buscaldi, D., Dessì, D., **Osborne, F.**, Piras, D., Reforgiato Recupero, D. and Rocca, S. (2024) Identifying Semantic Relationships Between Research Topics Using Large Language Models in a Zero-Shot Learning Setting. *Submitted to IEEE Access*.
4. Aggarwal, T., Salatino, A., **Osborne, F.**, Reforgiato Recupero, D., Angioni, S., and Motta, E. Leveraging Large Language Models for the Automatic Ontology Generation. *Submitted to Information Processing and Management*.
5. Salatino, A., Aggarwal, T., Mannocci, A., **Osborne, F.**, and Motta, E. A Survey on Knowledge Organization Systems of Research Fields: Resources and Challenges. *Submitted to Quantitative Science Studies*.
6. Buscaldi, D., Dessì, D., Motta, E., Murgia, M., **Osborne, F.**, and Reforgiato Recupero, D. (2024) Evaluating Large Language Models for Context-Aware Citation Prediction. *Submitted to Information Processing and Management*.
7. Motta, E., Daga, E. Gangemi, A. Lunde Gjelsvikb, M., **Osborne, F.**, and Salatino, A. The Epistemology of Fine-Grained News Classification. *Submitted to Semantic Web Journal*.
8. Meloni, A., Angioni, S., Salatino, A., **Osborne, F.**, Reforgiato Recupero, D. and Motta, E. Enhancing Conversational Agents Reliability and Accuracy by Integrating Scientific Knowledge Graphs. *Submitted to Information Systems*.
9. Borrego, A., Dessì, D., Hernández, I., **Osborne, F.**, Reforgiato Recupero, D., Ruiza, D., Buscaldi, D., and Motta, E. Research Hypothesis Generation over Scientific Knowledge Graphs. *Submitted to Knowledge Based Systems*.
10. Lehmann, J., Meloni, A., Motta, E., Osborne, F., Salatino, A., and Vahdati, S. Exploring Large Language Models for Translating Natural Language Text into SPARQL. *Submitted to Transaction on Intelligent Systems and Technology*.
11. Bolaños, F., Angioni, S., Salatino, A., **Osborne, F.** and Motta, E. (2024) Artificial Intelligence for Literature Reviews: Opportunities and Challenges. *Artificial Intelligence Review*.
12. Zavarella, V., Consoli, S., Reforgiato Recupero, D., Fenu, G., Angioni, S., Buscaldi, D., Dessì, D., and Osborne, F. (2024) Triplétoile: Extraction of Knowledge from Microblogging Text. *Heliyon*.
13. Angioni, S., Consoli, S., Dessì, D., **Osborne, F.**, Reforgiato Recupero, D., and Salatino, A. (2024) Exploring Environmental, Social, and Governance (ESG) Discourse in News: An AI-Powered Investigation through Knowledge Graph Analysis. *IEEE Access*.

14. Cadeddu, A., Chessa, A., De Leo, V., Fenu, G., Motta, E., **Osborne, F.**, Reforgiato Recupero, D., Salatino, A., and Secchi (2024) A Comparative Analysis of Knowledge Injection Strategies for Large Language Models in the Scholarly Domain. *Engineering Applications of Artificial Intelligence*.
15. Cadeddu, A., Chessa, A., De Leo, V., Fenu, G., Motta, E., **Osborne, F.**, Reforgiato Recupero, D., Salatino, A., and Secchi, L. (2023) Optimizing Tourism Accommodation Offers by Integrating Language Models and Knowledge Graph Technologies. *Information*.
16. Buscaldi, D., Dessì, D., Motta, E., Murgia, M., **Osborne, F.**, and Reforgiato Recupero, D. (2024) Citation Prediction by Leveraging Transformers and Natural Language Processing Heuristics. *Information Processing and Management*.
17. Chessa, A., Fenu, G., Motta, E., **Osborne, F.**, Reforgiato Recupero, D., Salatino, A.A., and Secchi, L. (2023) Data-driven Methodology for Knowledge Graph Generation within the Tourism Domain. *IEEE Access*.
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19. Peng, C., Xia, F., Naseriparsa, M. and **Osborne, F.** (2023) Knowledge Graphs: Opportunities and Challenges. *Artificial Intelligence Review*.
20. Aggarwal, T., Salatino, A.A., **Osborne, F.**, and Motta, E. (2022) R-classify: Extracting research papers' relevant concepts from a controlled vocabulary. *Software Impact*.
21. Borrego, A., Dessì, D., Hernández, I., **Osborne, F.**, Reforgiato Recupero, D., Ruiza, D., Buscaldi, D., and Motta, E. (2022) Completing Scientific Facts in Knowledge Graphs of Research Concepts. *IEEE Access*.
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23. Bongini, P., **Osborne, F.**, Pedrazzoli, A., Rossolini, M. (2022) A topic modelling analysis of white papers in security token offerings: which topic matters for funding? *Technological Forecasting & Social Change*. Manghi, P., Mannocci, M., **Osborne, F.**, Sacharidis, D., Salatino, A., and Vergoulis, T. (2022) New Trends in Scientific Knowledge Graphs and Research Impact Assessment. *Quantitative Science Studies*.
25. Angioni, S., Salatino, A.A., **Osborne, F.**, Reforgiato Recupero, D. and Motta, E. (2022) The AIDA Dashboard: a Web Application for Assessing and Comparing Scientific Conferences. *IEEE Access*.
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27. Salatino, A.A., **Osborne, F.** and Motta, E. (2022) CSO Classifier 3.0: A scalable unsupervised method for classifying documents in terms of research topics. *Int J Digit Libr* 23, 91–110 (2022).
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33. Mannocci, A., **Osborne, F.** and Motta, E. (2019) The Evolution of IJHCS and CHI: A Quantitative Analysis. *International Journal of Human-Computer Studies*.
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39. Carmagnola, F., **Osborne, F.** and Torre, I. (2014) Escaping the Big Brother: An empirical study on factors influencing identification and information leakage on the Web. *Journal of Information Science*, 40(2), pp.180-197, SAGE.
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44. Lehmann, J., Meloni, A., Motta, E., Osborne, F., Salatino, A., Vahdati, S. (2024) Large Language Models for Scientific Question Answering: an Extensive Analysis of the SciQA Benchmark. *Extended Semantic Web Conference 2024, Crete, Greece*.
45. Hoang Le, H., **Osborne, F.**, Pedrazzoli, A., Rossolini, M. (2024) The impact of narrative elements on the success of Initial Coin Offerings: The role of radical innovation and money saliency in funding success. *Crypto Asset Lab Conference 2024, Rome, Italy*.
46. Bongini, P., **Osborne, F.**, Maurino, A., Rossolini, M., Russo, I. (2023) Navigating the European Taxonomy with AI and Large Language Models: Mapping Sustainable Activities to NACE Codes. *New Frontiers in Banking and Capital 2023, Rome, Italy*.
47. Meloni, A., Angioni, S., Salatino, A., **Osborne, F.**, Birukou, A., Reforgiato Recupero, D. and Motta, E. (2023) AIDA-Bot 2.0: Enhancing Conversational Agents with Knowledge Graphs for Analysing the Research Landscape. *International Semantic Web Conference 2023, Athens, Greece*.
48. Salatino, A., Angioni, S., **Osborne, F.**, Reforgiato Recupero, D. and Motta, E. (2023) Diversity of Expertise is Key to Scientific Impact: a Large-Scale Analysis in the Field of Computer Science. *International Conference on Science, Technology and Innovation Indicators 2023, Leiden, The Netherlands*.
49. Bongini, P., **Osborne, F.**, Maurino, A., Rossolini, M. (2022) The information power of social media: a data-driven analysis of the impact of Reddit on GameStop stocks. *Fintech for the common good 2022, Utrecht, The Netherlands*.
50. Angioni, S., Salatino, A., **Osborne, F.**, Birukou, A., Reforgiato Recupero, D. and Motta, E. (2022) Leveraging Knowledge Graph Technologies to Assess Journals and Conferences at Springer

- Nature. International Semantic Web Conference 2022, Hangzhou, China. **[Best In-use Paper Award]**
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 52. Angioni, S., Salatino, A., **Osborne, F.**, Birukou, A., Reforgiato Recupero, D. and Motta, E. (2021) Assessing Scientific Conferences through Knowledge Graphs. International Semantic Web Conference 2021, Industry Track. Online.
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 55. Bellatreche, L. et al. Databases and Information Systems in the AI Era: Contributions from ADBIS, TPD and EDA 2020 Workshops and Doctoral Consortium. ADBIS/TPDL/EDA Workshops 2020.
 56. Salatino, A.A., Thanapalasingam, T., Mannocci, A., **Osborne, F.** and Motta, E. (2019) Improving Editorial Workflow and Metadata Quality at Springer Nature. International Semantic Web Conference 2019, Auckland, New Zealand.
 57. Salatino, A.A., **Osborne, F.**, Thanapalasingam and Motta, E. (2019) The CSO Classifier: Ontology-Driven Detection of Research Topics in Scholarly Articles. In: TPD 2019: 23rd International Conference on Theory and Practice of Digital Libraries.
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 61. **Osborne, F.** and Motta, E. (2018) Pragmatic Ontology Evolution: Reconciling User Requirements and Application Performance, International Semantic Web Conference 2018, Monterey, CA (USA).
 62. Wolfram, N., Lago, P. and **Osborne, F.** (2017) Sustainability in Software Engineering. SustainIT 2017. Funchal, Portugal.
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 64. **Osborne, F.**, Salatino, A., Birukou, A., Thanapalasingam, T., and Motta, E. (2017) Supporting Springer Nature Editors by means of Semantic Technologies. International Semantic Web Conference 2017, Industry Track. Vienna, Austria.
 65. Cano-Basave, A. E., **Osborne, F.** and Salatino, A.A. (2016) Ontology Forecasting in Scientific Literature: Semantic Concepts Prediction based on Innovation-Adoption Priors. EKAW 2016, Bologna, Italy.
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69. **Osborne, F.**, Scavo, G. and Motta, E. (2014) Identifying diachronic topic-based research communities by clustering shared research trajectories. Extended Semantic Web Conference 2014, Crete, Greece.
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75. **Osborne, F.**, Motta, E. and Mulholland, P. (2013) Exploring Scholarly Data with Rexplore. International Semantic Web Conference, Sydney, Australia.
76. **Osborne, F.**, Cena, F. and Likavec, S. (2013) Granular semantic user similarity in the presence of sparse data. AI*IA 2013, Turin, Italy.
77. **Osborne, F.** (2013) A POV-based user model: From learning preferences to learning personal ontologies. International Conference on User Modeling, Adaptation, and Personalization 2013, Rome, Italy.
78. **Osborne, F.** and Motta, E. (2012) Mining Semantic Relations between Research Areas. International Semantic Web Conference, Boston, MA, USA.
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83. Dessì, R., Dessì, D., **Osborne, F.**, Aras, H. (eds.) (2024) Second International Workshop on Semantic Technologies and Deep Learning Models for Scientific, Technical and Legal Data (SemTech4STLD) co-located with the Extended Semantic Web Conference 2024 (ESWC 2024), Hersonissos, Greece, May 26th, 2024. CEUR Workshop Proceedings 3697, CEUR-WS.org 2024.
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85. Alam, M, Buscaldi, D., Cochez, M., **Osborne, F.**, Recupero Reforgiato, D. 2023 (eds.) (2023) Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG 2023) co-located with the 21th International Semantic Web Conference (ISWC 2023). CEUR Workshop Proceedings 3559, CEUR-WS.org 2023.
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89. Alam, M., Buscaldi, D., Cochez, M., **Osborne, F.**, Reforgiato Recupero, D., Sack, H. (eds.) (2022) Special Issue on Deep Learning and Knowledge Graphs. Semantic Web Journal.
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104. Angioni, S., Consoli, S., Dessì, D., **Osborne, F.**, Reforgiato Recupero, D., Salatino, A. (2024) Investigating Environmental, Social, and Governance (ESG) Discussions in News: A Knowledge Graph Analysis Empowered by AI. International Workshop on Semantic Technologies and Deep Learning Models for Scientific, Technical and Legal Data (SemTech4STLD 2024) at the Extended Semantic Web Conference (ESWC 2024).
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