

# Francesco Osborne, PhD

## Curriculum Vitae – 2023

### EXECUTIVE SUMMARY

I am a Senior Research Fellow at the Knowledge Media institute of The Open University in Milton Keynes, UK, where I lead the Scholarly Knowledge Mining (SKM) team (<http://skm.kmi.open.ac.uk/>), which is widely recognised as one of the top international research groups in Scholarly Analytics. I have an MSc and a PhD in Computer Science from the University of Turin, Italy. My research covers Artificial Intelligence, Data Science, Big Data, Information Extraction, Knowledge Graphs, Science of Science, Semantic Web, Research Analytics, and Semantic Publishing. I have authored more than a hundred peer-reviewed publications in top journals and conferences in my research areas, including the Semantic Web Journal, Neurocomputing, Future Generation Computer Systems, the International Journal of Human-Computer Studies, ISWC, ESWC, WebConf, JCDL, TPDFL, and UMAP. I won several awards, including the Best In-Use Paper Award at the International Semantic Web Conference 2022, the Best Demo Award the International Semantic Web Conference 2020, and the Semantic Publishing Award at European Semantic Web Conference 2014. I regularly organize scientific events and special issues. Most recently I chaired the Workshop on Scientific Knowledge (Sci-K at TheWebConf 2022), the Workshop on Deep Learning for Knowledge Graphs (DL4KG at ISWC 2022), and acted as guest editor for two special issues of the Semantic Web Journal and Quantitative Science Studies. I am also a member of the Editorial Board of the Data Intelligence Journal and the Knowledge Graph Construction W3C Community Group.

Since 2013, I have contributed, either as PI, Co-PI, or Technical Director to bringing in over £870K 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 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, Bologna, Cagliari, 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 main objective of my work is supporting the paradigm shift towards Open Science by producing an open and machine-readable representation of scientific knowledge. This will enable a new generation of AI systems exploring and analysing the research literature at scale, informing funding decisions, and assisting researchers in formulating hypotheses, performing experiments, and sharing research outcomes. 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 10M methods, tasks, materials, and metrics automatically extracted from computer science articles.

## **1 HIGHER EDUCATION**

### **Degrees**

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**

2022-now	Senior Research Fellow at the Knowledge Media Institute of the Open University in Milton Keynes, UK.
2018-now	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.

2022-now	Supervising the generation of machine learning models for the automatic generation of metadata from online courses in the context of the VocTeach projects. Adapting these technologies to be used also on the OU courses.
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:**

2022-now	Linda Andersson (Developer)
2021	Alessio Toscano (Developer)
2018-2019	Hakan Ezgi Kızıloz (Visiting Researcher), now Research Associate at the University of Ankara, Turkey
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- now	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, Research Analytics, Science of Science, Open Science, Artificial Intelligence, Knowledge Engineering, Semantic Web, and Semantic Publishing.

**Awards**

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.
2021	Most Influential Scholar Award – Honourable Mention (AI2000 2021), Top 25 Worldwide Researcher in Knowledge Engineering - the Artificial Intelligence 2000 Most Influential Scholar List ( <a href="http://kmi.open.ac.uk/news/article/19706">http://kmi.open.ac.uk/news/article/19706</a> ). Rank based on citations in the top venues of Knowledge Engineering and Semantic Technologies.

- 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

- 2022 **VocTeach: National Educational Content Aggregator – Work package Leader.** This project will 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 aims 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 is 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 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

2021-now	Co-Supervisor of Antonello Meloni (University of Cagliari, Italy). Working on conversational agents.
2021-now	Co-Supervisor of Agustín Borrego (University of Seville, Spain). Working on knowledge graph completion and hypothesis generation.
2021-now	Co-Supervisor of Luca Secchi (University of Cagliari, Italy). Working on knowledge graph generation.
2021-now	Co-Supervisor of Simone Angioni (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 Associate 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

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., <a href="http://w3id.org/aida">http://w3id.org/aida</a> , <a href="http://w3id.org/aikg">http://w3id.org/aikg</a> ).
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 <a href="https://tinyurl.com/22jm2xyc">https://tinyurl.com/22jm2xyc</a> .

### External PhD Examinations

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).

### 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 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 Co-editor of Quantitative Science Studies special issue on Scientific Knowledge Graphs and Research Impact Assessment.
- 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<sup>th</sup> 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**

- 2022 Co-chair of the International Workshop on Scientific Knowledge: Representation, Discovery, and Assessment (Sci-K) at TheWebConf 2022
- 2022 Co-chair of the International Workshop on Knowledge Graph Generation from Text (Text2KG) at ESWC 2022
- 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.
- 2021-2022 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 Doctoral consortium at EKAW 2018.
- 2018 Co-chair of Reframing Research (RefResh) Workshop at EUROCSS 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).

**Invited lectures**

- 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:* topic modelling, named entity recognition, transformers, 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, TPDL 2022, ISWC 2022 (senior), SEMANTiCS 2022, EKAW 2022, TheWebConf 2023 (senior), ESWC 2023 (senior).

## **Session chair**

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

## **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, Scientific Data, Automation in Construction.

## **Project Reviewer**

Croatian Science Foundation, Swiss National Science Foundation, French National Agency for Research (Foundation Agence nationale de la recherche).

## **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 conversational agents 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 .

## 9 PUBLICATIONS

### Edited Books

1. 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*. Manghi, P., Mannocci, A., Osborne, F., Sacharidis, D., Salatino, A., Vergoulis, T. (eds.) (2022) *Proceedings of Sci-K 2022 - International Workshop on Scientific Knowledge: Representation, Discovery, and Assessment*. WWW (Companion Volume) 2022: 735-738
3. Tiwari, S., Mihindukulasooriya, N., Osborne, F., Kontokostas, D., D'Souza, J., Kejriwal, M., Bozzato, L., Anita Carriero, V., Hahmann, T., Zimmermann, A. (eds.) (2022) *Proceedings of the 1st International Workshop on Knowledge Graph Generation From Text and the 1st International Workshop on Modular Knowledge co-located with 19th Extended Semantic Conference (ESWC 2022)*, Hersonissos, Greece, May 30th, 2022. CEUR Workshop Proceedings 3184, CEUR-WS.org 2022.
4. Manghi, P., Mannocci, A., Osborne, F., Sacharidis, D., Salatino, A., Vergoulis, T. (eds.) (2022) *New trends in scientific knowledge graphs and research impact assessment*, Special Issue of *Quantitative Science Studies*.
5. Alam, M., Buscaldi, D., Cochez, M., Osborne, F., Reforgiato Recupero, D., Sack, H. (eds.) (2021) *Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG2021) co-located with the International Semantic Web Conference 2021 (ISWC 2021)*. CEUR Workshop Proceedings 3034, CEUR-WS.org 2021.
6. Alam, M., Buscaldi, D., Cochez, M., Osborne, F., Reforgiato Recupero, D., Sack, H. (eds.) (2020) *Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG2020) co-located with the 17th Extended Semantic Web Conference 2020 (ESWC 2020)*, Heraklion, Greece, June 02, 2020 - moved online. CEUR Workshop Proceedings 2635, CEUR-WS.org 2020. Gonzalez-Beltran, A., Osborne, F., and Vahdati, S. (eds.) (2020) *Special Issue on Scholarly Data Analysis (Semantics, Analytics, Visualisation)*. *Data Science*.
8. Mehwish Alam, Davide Buscaldi, Michael Cochez, Francesco Osborne, Diego Reforgiato Recupero, Harald Sack (eds.) (2019) *Proceedings of the Workshop on Deep Learning for Knowledge Graphs (DL4KG2019) Co-located with the 16th Extended Semantic Web Conference 2019 (ESWC 2019)*, Portoroz, Slovenia, June 2, 2019. CEUR Workshop Proceedings 2377, CEUR-WS.org 2019.
9. Hollink, L., Osborne, F. (eds.) (2018) *Proceedings of the EKAW Doctoral Consortium 2018 co-located with the 21st International Conference on Knowledge Engineering and Knowledge Management (EKAW 2018)*, Nancy, France, November 13, 2018. CEUR Workshop Proceedings 2306.
10. Gonzalez-Beltran, A., Osborne, F., Peroni, S., and Vahdati, S. (eds.) (2018) *Semantics, Analytics, Visualization: 3rd International Workshop, SAVE-SD 2017, Perth, Australia, April 3, 2017, and 4th International Workshop, SAVE-SD 2018, Lyon, France, April 24, 2018, Revised Selected Papers*.
11. Gonzalez-Beltran, A., Osborne, F. and Peroni, S. (eds.) (2017) *Semantics, Analytics, Visualization. Enhancing Scholarly Data: Second International Workshop, SAVE-SD 2016, Montreal, QC, Canada, April 11, 2016, Revised Selected Papers*. *Semantics, Analytics, Visualization. Enhancing Scholarly Data*. eds. Springer Nature.

### Chapters in Books

12. Salatino, A.A., Mannocci, A. and Osborne, F. (2021) *Detection, Analysis, and Prediction of Research Topics with Scientific Knowledge Graphs. Predicting the Dynamics of Research Impact*. Springer.
13. Salatino, A.A., Osborne, F. and Motta, E. (2020) *Ontology Extraction and Usage in the Scholarly Knowledge Domain. Applications and Practices in Ontology Design, Extraction, and Reasoning (Studies on the Semantic Web Series)*. IOS Press.
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