Pasquale Minervini – Curriculum Vitæ

Contact Details

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Employment History

02/2019 – *Current* — *Senior Research Associate*
University College London, London, UK
Senior Research Associate in Statistical Natural Language Processing and Machine Learning in the UCL Natural Language Processing group. My position is fully funded by a three years H2020 grant I am the PI of.

06/2020 – *Current* — *Consultant*, London, UK
Automated news analysis and verification in a London startup.

10/2016 – 02/2019 — *Research Associate*
University College London, London, UK
Research Associate in Statistical Natural Language Processing and Machine Learning in the UCL Machine Reading group.

12/2015 – 10/2016 — *Postdoctoral Fellow*
INSIGHT Centre, NUI Galway, Galway, Ireland
Researcher in the area of knowledge discovery from both structured and unstructured data on the Web. The project is fully funded by, and in close collaboration with, Fujitsu Laboratories Ltd. and Fujitsu Ireland.

10/2015 – 12/2015 — *Natural Language Processing (NLP) Engineer*
Aylien Ltd., Dublin, Ireland
Research, development, and deployment of Deep Learning-based NLP models and systems - improved an internal pre-existing NLP system *in a matter of days* using differentiable architectures trained via distant supervision, and made it available to paying customers.

9/2014 – 9/2015 — *Postdoctoral Fellow*
Università degli Studi di Bari, Bari, Italy
Researcher for a research project titled "Methods and Techniques for Publishing and Mining in the Web of Data".

06/2010 – 01/2011 — *Research Engineer*
Università degli Studi di Bari, Bari, Italy
Research Engineer on DOMINUS, a research project aiming at realising an intelligent document management system.

04/2010 – 05/2010 — *Research Engineer*
Artificial Brain SRL, Bari, Italy
Research Engineer for a company created in the Knowledge Acquisition & Machine Learning Laboratory at Università degli Studi di Bari.

05/2009 – 09/2009 *Software Engineer*
Google Inc.
Software Engineer for The Apertium Project, a Free/Open-Source Rule-Based Machine Translation platform developed at the Universitat d'Alacant (University of Alicante). The project was financed by Google Inc. through the Google Summer of Code 2009 program.

06/2007 – 10/2007 *Research Assistant*
Università degli Studi di Bari, Bari, Italy
Research Assistant for the MIUR FAR research project *Cultural Heritage fruition & e-learning applications of new Advanced (multimodal) Technologies* (CHAT).

Academic History

May 2014 **Ph.D.** in Computer Science
Institution: **Università degli Studi di Bari**, Bari, Italy
Thesis Title: "Mining Methods for the Web of Data"
Advisor: Prof. Nicola Fanizzi Viva: May 26th, 2014

February 2010 **Master's Degree** in Computer Science
Institution: **Università degli Studi di Bari**, Bari, Italy
Topics: Knowledge Bases, Data Mining, Machine Learning, Multi-Agent Systems, Natural Language Processing, Network Collaboration.
Grade: **110/110, summa cum laude** (highest possible grade)

February 2007 **Bachelor's Degree** in Computer Science
Institution: **Università degli Studi di Bari**, Bari, Italy
Thesis Title: "Theta-Subsumption between Horn Clauses: Reduction of a NP-complete problem to the Boolean Satisfiability Problem"
Advisor: Prof. Nicola Di Mauro
Grade: **110/110, summa cum laude** (highest possible grade)

Record of Research Funding

2019 **Horizon 2020 Research Grant**
Funding Body: **European Commission**
Value of Award: 4,841,962.5 EUR
Project: CLARIFY – Cancer Long Survivors Artificial Intelligence Follow Up
Duration: January 2020 – December 2022
Type of Grant: Research Funding
Role on the Grant: Principal Investigator
I wrote the NLP-related parts in the original proposal, and I am now managing the project on the UCL end (financially, ethically, and legally), coordinating a Work Package, and contributing to several others.
The project involves twelve institutions and 4,841,962.50 EUR in funding. UCL was awarded 347,500 EUR of funding over a three years period.
My role consists in designing novel NLP and relational learning solutions for jointly analysing Electronic Health Records, knowledge bases, and scientific literature to increase cancer patients' post-treatment quality of life and well-being. Feel free to contact me for further information.

2016, 2018 **Two NVIDIA Academic Hardware Grants**
Funding Body: **NVIDIA Corporation**

Value of Award: One NVIDIA Titan X GPU, One NVIDIA Titan Xp GPU
Type of Grant: Hardware Grant
Role on the Grant: Principal Investigator

2011 – 2014 **Merit-based Research Grant**
Funding Body: **Ministry of Education, Universities and Research** (Italy)
Value of Award: 36.000 EUR
Type of Grant: Scholarship

Prizes

- Best Research Paper Award at the 19th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2014)
- Best Research Paper Award at the 10th International Workshop on Uncertainty Reasoning for the Semantic Web (URSW 2014)
- Winner of the 4th Linked Data Mining Challenge (Know@LOD 2016)
- Ranked 5th worldwide in the Kaggle The Allen AI Science Challenge

Teaching and Supervision

Teaching

- Lecturer, Guest Lecturer, and TA at University College London (2017-2020)
  Courses: Statistical Natural Language Processing, Introduction to Deep Learning
- Guest Lecturer at University College London
  Courses: Informatics for Healthcare, Topic: Introduction to NLP
- Speaker for the:
  - AAAI 2020 Tutorial on Explainable AI – Foundations, Industrial Applications, Practical Challenges, and Lessons Learned
  - AAAI 2019 Tutorial on Explainable AI – From Theory to Motivation, Applications and Limitations
  - ECML 2019 Tutorial on Explainable Knowledge Discovery in Data Mining
  - International Experts Tutorial on eXplainable AI, Seoul, Korea
    Travel expenses and salary were provided by the Korea Advanced Institute of Science and Technology (KAIST), Sungkyunkwan University (SKKU), and Inha University.
- Lecturer at the Summer School on Statistical Relational Artificial Intelligence
  Module: Differentiable Program Interpreters
- Guest Lecturer at University College London
  Module: Statistical Natural Language Processing
  Topic: Recurrent Neural Networks, Years: 2016, 2017
- Teaching Assistant at University of Bari, Italy
  Module: Image Processing, Years: 2013-2014
  Module: Computer Programming, Years: 2012-2013

External Examiner

- **Sameh K. Mohamed**.
  Enhancing Knowledge Graph Completion Models and Selected Biological Applications.
  Degree: Ph.D. in Computer Science at NUI Galway, Ireland Viva: Feb. 2020

Supervision

- **Stacey, Joe**.
  Adversarial Learning for Bias Removal in Natural Language Processing.
  Degree Programme: UCL M.Sc. ML Year: 2019
  Nominated for the MAPS Faculty Postgraduate Prize.

- **Byun, Jeunghyun**.
  Context-Aware Neural Link Predictors.
  Degree Programme: UCL M.Sc. ML Year: 2019

- **Zhu, Yuchen**.
  Quaternion Knowledge Graph Embeddings.
  Degree Programme: UCL M.Sc. ML Year: 2019

- **Gupta, Arijit**.
  Improving Common Sense Reasoning Models.
  Degree Programme: UCL M.Sc. ML Year: 2019

- **Arakelyan, Erik**.
  Query Answering with Knowledge Graph Embeddings.
  Degree Programme: UCL M.Sc. ML Year: 2019

- **Zaman, Khalil**.
  Improving Neural Theorem Provers.
  Degree Programme: UCL M.Sc. ML Year: 2018-2019

- **Zheng, Zhedong**.
  Link Prediction as Natural Language Inference.
  Degree Programme: UCL M.Sc. ML Year: 2018

- **Cowen-Rivers, Alexander**.
  Neural Variational Knowledge Graph Embeddings.
  Degree Programme: UCL M.Sc. ML Year: 2018
  Published in NeSy at IJCAI 2019.

- **Weber, Philipp Leon**.
  NLProlog - Reasoning with Weak Unification for NLP.
  Degree Programme: Humboldt University of Berlin M.Sc. CS Year: 2018
  Published in ACL 2019.

- **Alakuijala, Minttu**.
  Reinforcement Learning for Query Reformulation and Multi-Step Question Answering.
  Degree Programme: UCL M.Eng. CS Year: 2017-2018

- **Benfatti, Andrea**.
  Multi-Task Learning Applied to Question Answering.
  Degree Programme: UCL M.Sc. ML Year: 2017

- **Zhang, Wenbo**.
  A Reinforcement Learning Model for Multiple Choice Question Answering.
  Degree Programme: UCL M.Sc. DS Year: 2017

- **Inglis, Rogan**.
  Machine Reading for Scientific Publications Using Generative Regularisation.
  Degree Programme: UCL M.Sc. ML Year: 2017

- **Coppola, Marco**.
  Predictive Ranking Systems for Linked Open Data Resources.
  Degree Programme: UNIBA BSc CS Year: 2012-2013

Invited Talks

For talks outside the United Kingdom, expenses were covered by the hosting institutions.

- February 13th 2020 - IBM Watson Research Center, New York City, New York, US
- January 24th 2020 - Imperial College London, SPIKE Group, London, UK
- November 27th 2019 - Imperial College London, Explainable AI Seminars, London, UK
- August 29th 2019 - Inha University, Incheon, Korea
- August 26th 2019 - Sungkyunkwan University, Suwon Campus, Korea
- June 27th 2019 - Naver Labs Europe, Grenoble, France
- May 2nd 2019 - Samsung Researh AI Center, Seoul, South Korea
- February 25th 2019 - Data & Knowledge Engineering @ Uni. of Cardiff, Cardiff, UK
- November 23rd 2018 - Accenture Labs, Dublin, Ireland
- November 5th 2018 - DTAI @ KU Leuven, Leuven, Belgium
- October 25th 2018 - LTL @ University of Cambridge, Cambridge, United Kingdom
- October 19th 2018 - Twitter Cortex, London, United Kingdom
- October 6th 2018 - Uber AI Labs, San Francisco, California, United States
- August 3rd 2018 - Insight Centre for Data Analytics, Galway, Ireland
- February 27th 2018 - BenevolentAI, London, United Kingdom
- November 14th 2017 - Copenhagen NLP Meetup, Copenhagen, Denmark
- September 26th 2017 - Google NLP Summit, Zurich, Switzerland

Administrative Activities

Organiser

- ISWC 2020, The 19th International Semantic Web Conference, Reproducibility Track
- ECML PKDD 2019, Joint International Workshop on Advances in Interpretable Machine Learning and Artificial Intelligence & eXplainable Knowledge Discovery in Data Mining

PC Member

- AAAI Conference on Artificial Intelligence (AAAI) 2020
- International Joint Conference on Artificial Intelligence (IJCAI) 2019
- Annual Meeting of the Association for Computational Linguistics (ACL) 2019
- Annual Conference of the North American Chapter of the ACL (NAACL-HLT) 2019
- IEEE International Conference on Data Mining (IEEE ICDM) 2017-2018
- International Semantic Web Conference (ISWC) 2019
- IEEE International Conference on AI and Knowledge Engineering (IEEE AIKE) 2018
- Language, Data and Knowledge (LDK) 2019
- ACM Symposium on Applied Computing (ACM SAC) 2013-2019
  - Semantic Web and Applications (SWA) Track (2013-2019)
  - Knowledge and Language Processing (KLP) Track (2019)
- International Workshop on Statistical Relational AI (StarAI) 2017
- Knowledge Representation in Natural Language (KRNL) 2018
- Biennial Conference on Language, Data and Knowledge (LDK 2019)
- Workshop on Neural Abstract Machines & Program Induction (NAMPI) 2018

- Workshop on Neural-Symbolic Learning and Reasoning (NeSy) 2019

Reviewer

Conference on Neural Information Processing Systems (NeurIPS), International Conference on Learning Representations (ICLR), IEEE International Conference on Data Mining (ICDM), Conference on Empirical Methods in Natural Language Processing (EMNLP), Conference on Natural Language Learning (CoNLL), International Conference on Computational Linguistics (COLING), ACM Symposium on Applied Computing (SAC), IEEE Transactions on Knowledge and Data Engineering (TKDE), IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Journal of Web Semantics (JWS), IEEE International Conference on Semantic Computing (ICSE), International Journal of Semantic Computing (IJSC), Semantic Web Journal (SWJ), Information Sciences Journal, Elsevier (ISJ), Workshop on Automated Knowledge Base Construction (AKBC), Big Data and Cognitive Computing (BDCC), Artificial Intelligence Review (AIRE), Czech Science Foundation, and several others.

Publications, Tutorials, and Patents

Patents

- **Minervini**, Costabello, Muñoz, Nováček, Vandenbussche - Method and Apparatus for Completing a Knowledge Graph - US Patent Office, Application no. 15821088, US Patent App. 15/821,088, Applicant: Fujitsu Ltd.

Tutorials

- Lecue, Gade, Geyik, Kenthapadi, Mithal, Taly, Guidotti, **Minervini** - On Explainable AI: Foundations, Industrial Applications, Practical Challenges, and Lessons Learned - Tutorial for the Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI** 2020)
- Costabello, Lecue, Giannotti, Guidotti, Hitzler, **Minervini**, Sarker - On Explainable AI: From Theory to Motivation, Applications and Limitations - Half-day (3.5 hours) Tutorial for the Thirty-Third AAAI Conference on Artificial Intelligence (**AAAI** 2019)
- Guidotti, **Minervini**, Monreale, Rinzivillo - Tutorial on Explainable Knowledge Discovery in Data Mining - Tutorial for the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD** 2019)
- Lecue, **Minervini** - International Experts Tutorial on eXplainable AI - Artificial Intelligence Research Society, Seoul, Korea

Papers

- **Minervini**, Rocktäschel, Riedel, Grefenstette, Stenetorp - Learning Reasoning Strategies in End-to-End Differentiable Proving - 37th International Conference on Machine Learning (**ICML** 2020, 21.8% acceptance rate)
- **Minervini**, Bošnjak, Rocktäschel, Riedel, Grefenstette - Differentiable Reasoning on Large Knowledge Bases and Natural Language - 34th AAAI Conference on Artificial Intelligence (**AAAI** 2020, oral presentation 4.5% acceptance rate; overall 20.6%)
    - An extended version of this paper appeared as a chapter in *Knowledge Graphs for eXplainable Artificial Intelligence: Foundations, Applications and Challenges*, IOS Press
- Camburu, Shillingford, **Minervini**, Lukasiewicz, Blunsom - Make Up Your Mind! Adversarial Generation of Inconsistent Natural Language Explanations. 58th Annual Meeting of the Association for Computational Linguistics (**ACL** 2020, 17.6% acceptance rate)
- Bianchi, Rossiello, Costabello, Palmonari, **Minervini** - Knowledge Graph Embeddings and Explainable AI - Chapter in *Knowledge Graphs for eXplainable Artificial Intelligence: Foundations, Applications and Challenges*, IOS Press
- Stacey, **Minervini**, Dubossarsky, Riedel, Rocktäschel - There is Strength in Numbers:

Avoiding the Hypothesis-Only Bias in Natural Language Inference via Ensemble Adversarial Training. CoRR abs/2004.07790 (2020)

- Welbl, **Minervini**, Bartolo, Stenetorp, Riedel - Undersensitivity in Neural Reading Comprehension. CoRR abs/2003.04808 (2020)
- Camburu, Shillingford, **Minervini**, Lukasiewicz, Blunsom - Make Up Your Mind! Adversarial Generation of Inconsistent Natural Language Explanations - NeurIPS 2019 Workshop on Safety and Robustness in Decision Making (**SafeRobust@NeurIPS**, 2019)
- Weber, **Minervini**, Münchmeyer, Leser, Rocktäschel - NLProlog: Reasoning with Weak Unification for Question Answering in Natural Language - 57th Annual Meeting of the Association for Computational Linguistics (**ACL** 2019, 22.7% acceptance rate)
- Muñoz, **Minervini**, Nickles - Embedding Cardinality Constraints in Neural Link Predictors - 34th ACM/SIGAPP Symposium on Applied Computing (**ACM SAC** 2019, 25% acceptance rate)
- Cowen-Rivers, **Minervini**, Riedel, Rocktäschel, Wang, Bošnjak - Neural Variational Inference for Estimating Knowledge Graph Embedding Uncertainty - 14th International Workshop on Neural-Symbolic Learning and Reasoning (**NeSy@IJCAI** 2019)
- **Minervini**, Riedel - Adversarially Regularising Neural NLI Models to Integrate Logical Background Knowledge - SIGNLL Conference on Computational Natural Language Learning (**CoNLL** 2018, 20.65% acceptance rate)
- **Minervini**, Bošnjak, Campero, Rocktäschel, Grefenstette, Riedel - Neural Theorem Proving on Natural Language - International Conference on Probabilistic Programming (**PROBPROG** 2018)
- **Minervini**, Bošnjak, Rocktäschel, Riedel - Towards Neural Theorem Proving at Scale - Workshop on Neural Abstract Machines & Program Induction (**NAMPI** 2018)
- Mitchell, **Minervini**, Stenetorp, Riedel - Extrapolation in NLP - Workshop on Generalization in the Age of Deep Learning (**NAACL** 2018)
- Weissenborn, **Minervini**, Dettmers, Augenstein, Welbl, Rocktäschel, Bošnjak, Mitchell, Demeester, Stenetorp, Riedel - Jack the Reader – A Machine Reading Framework - Annual Meeting of the Association for Computational Linguistics (**ACL** 2018), System Demonstrations
- Dettmers, **Minervini**, Stenetorp, Riedel - Convolutional 2D Knowledge Graph Embeddings - 31st AAAI Conference on Artificial Intelligence (**AAAI** 2018, 24.6% acceptance rate)
- **Minervini**, Tresp, d'Amato, Fanizzi - Adaptive Knowledge Propagation in Web Ontologies - ACM Transactions on the Web (**TWEB** 2018)
- **Minervini**, Demeester, Rocktäschel, Riedel - Adversarial Sets for Regularising Neural Link Predictors - 33rd Conference on Uncertainty in Artificial Intelligence (**UAI** 2017)
- **Minervini**, Costabello, Muñoz, Nováček, Vandenbussche - Regularizing Knowledge Graph Embeddings via Equivalence and Inversion Axioms - European Conference on Machine Learning & Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD** 2017) (27% acceptance rate)
- **Minervini**, d'Amato, Fanizzi - Efficient Energy-Based Embedding Models for Link Prediction in Knowledge Graphs - Journal on Intelligent Information Systems (**JIIS** 2016), Recent Advances in Mining Patterns from Complex Data, ISSN 1573-7675
- **Minervini**, d'Amato, Fanizzi, Tresp - Discovering Similarity and Dissimilarity Relations for Knowledge Propagation in Web Ontologies - Journal on Data Semantics (**JoDS** 2016), ISSN 1861-2040

- **Minervini**, d'Amato, Fanizzi - Leveraging the Schema in Latent Factor Models for Knowledge Graph Completion - Proceedings of the ACM Symposium on Applied Computing - Semantic Web Track (**ACM SAC** 2016), Pisa, Italy (24% acceptance rate)
- Yumusak, Muñoz, **Minervini**, Dogdu, Kodaz - A Hybrid Method for Rating Prediction Using Linked Data Features and Text Reviews - (**KNOW@LOD/CoDeS@ESWC** 2016)
- **Minervini**, d'Amato, Fanizzi, Esposito - Scalable Learning of Entity and Predicate Embeddings for Knowledge Graph Completion - 14th IEEE International Conference on Machine Learning and Applications, (**ICMLA** 2015), ISBN 978-1-5090-0287-0
- **Minervini**, d'Amato, Fanizzi, Esposito - Efficient Learning of Entity and Predicate Embeddings for Link Prediction in Knowledge Graphs - Proceedings of the 11th International Workshop on Uncertainty Reasoning for the Semantic Web (**URSW** 2015)
- **Minervini**, d'Amato, Fanizzi, Esposito - A Gaussian Process Model for Knowledge Propagation in Web Ontologies - IEEE International Conference on Data Mining (**ICDM** 2014), ISBN 978-1-4799-4302-9 (19% acceptance rate)
- **Minervini**, d'Amato, Fanizzi, Esposito - Adaptive Knowledge Propagation in Web Ontologies - Proceedings of the 19th International Conference on Knowledge Engineering and Knowledge Management (**EKAW** 2014), ISBN 978-3-319-13703-2, Linköping, Sweden (**best research paper award**)
- **Minervini**, d'Amato, Fanizzi, Esposito - Graph-Based Regularization for Transductive Class-Membership Prediction. In: Uncertainty Reasoning for the Semantic Web III - ISWC International Workshops, **URSW** 2011-2013, Revised Selected Papers - Springer, ISBN: 978-3-319-13412-3
- **Minervini**, d'Amato, Fanizzi, Esposito - Learning Probabilistic Description Logic Concepts Under Alternative Assumptions on Incompleteness. In: Uncertainty Reasoning for the Semantic Web III - ISWC International Workshops, **URSW** 2011-2013, Revised Selected Papers - Springer, ISBN: 978-3-319-13412-3
- **Minervini**, d'Amato, Fanizzi, Tresp - Learning to Propagate Knowledge in Web Ontologies. - Proceedings of the 10th International Workshop on Uncertainty Reasoning for the Semantic Web (**URSW** 2014, **best research paper award**)
- **Minervini**, Fanizzi, d'Amato, Esposito - Rank Prediction for Semantically Annotated Resources - Proceedings of the ACM Symposium on Applied Computing - Semantic Web Track (**ACM SAC** 2013), ISBN 978-1-4503-1656-9 (24% acceptance rate)
- **Minervini**, d'Amato, Fanizzi, Esposito - Transductive Inference for Class-Membership Propagation in Web Ontologies - The Semantic Web: Semantics and Big Data (**ESWC** 2013), ISBN 978-3-642-38287-1 (26% acceptance rate)
- **Minervini**, d'Amato, Fanizzi - A Graph Regularization Based Approach to Transductive Class-Membership Prediction - Proceedings of the 8th International Workshop on Uncertainty Reasoning for the Semantic Web (**URSW** 2012)
- Fanizzi, d'Amato, Esposito, **Minervini** - Numeric Prediction on OWL Knowledge Bases through Terminological Regression Trees - International Journal on Semantic Computing (**IJSC**) 2012
- **Minervini**, d'Amato, Fanizzi - Learning Terminological Bayesian Classifiers: A Comparison of Alternative Approaches to Dealing with Unknown Concept Memberships - Proceedings of the 9th Italian Convention on Computational Logic (**CILC** 2012)
- **Minervini**, d'Amato, Fanizzi - Learning Terminological Naive Bayesian Classifiers under Different Assumptions on Missing Knowledge. Proceedings of the 7th International

Workshop on Uncertainty Reasoning for the Semantic Web (**URSW** 2011), CEUR Workshop Proceedings vol. 778 ISSN 1613-0073, pg. 63-74

- **Minervini**, d'Amato, Fanizzi - Learning Probabilistic Description Logic Concepts Under Different Assumptions on Missing Knowledge. Proceedings of the ACM Symposium on Applied Computing - Semantic Web Track (**ACM SAC** 2012), ISBN 978-1-4503-0857-1 (26% acceptance rate)
- Calefato, Lanubile, **Minervini** - Can Real-Time Machine Translation Overcome Language Barriers in Distributed Requirements Engineering? - 5th IEEE International Conference on Global Software Engineering (**ICGSE** 2010) ISBN 978-1-4244-7619-0
- **Minervini** - Apertium goes SOA: an efficient and scalable service based on the Apertium rule-based machine translation platform - Proceedings of the First International Workshop on Free/Open-Source Rule-Based Machine Translation (**FreeRBMT** 2009), ISBN-13: 978-8-46-136188-5, pg. 59-65