

Prof. Leopoldo Bertossi

Research Profile¹



Research Areas:

- Explainable AI and Machine Learning
- Causality and Fairness in Data Science
- Data Science and Data Management
- Statistical Relational Learning
- Probabilistic Graphical Models
- Knowledge Representation in AI
- Ontologies and Knowledge Graphs
- Business Intelligence
- Data Integration and Quality
- Logic Programming and Computational Logic
- Foundations of Probability and Statistical Methods

Current Affiliations:

- Professor, Skema Business School, Montreal, Canada. Full-time. Since July 2022.
- Professor Emeritus, with Independent Graduate Supervisor Status. Carleton University, Ottawa, Canada. Since 2019.
- Universidad Adolfo Ibáñez (UAI), Santiago, Chile. Senior UAI Fellow, and Graduate Supervisor. Since 2019.
- Senior Researcher “Millennium Institute for Foundational Research on Data” (IMFD, Chile). Since 2018.
- Basal “Center for Artificial Intelligence Research” (CENIA, Chile). International Research Collaborator. Since 2022.

Education:

- PhD in Exact Sciences, Mathematics,. Pontifical Catholic University of Chile (PUC, Chile), 1988.
- Masters in Exact Sciences, Mathematics. PUC Chile, 1982.
- Bachelor of Honors in Mathematics. PUC Chile, 1976.

Some Career Highlights:

- “NSERC Discovery Grant” holder. 2023-2027. “Explanations and Interpretation in Machine Learning”. Ca\$ 41K per year.
- Full Professor, UAI, Faculty of Engineering and Sciences. Until July 2022.
- Director PhD & MSc Programs in Data Science, UAI. Until July 2022.
- RelationalAI Inc. (Berkeley, CA). Senior Computer Scientist. 2018-20.

¹ Download a full CV from: www.scs.carleton.ca/~bertossi/cv23.pdf
Email: bertossi@scs.carleton.ca Web Page: www.scs.carleton.ca/~bertossi

- Full Professor of Computer Science, Carleton University, Ottawa, Canada. 2001-2019.
- Associate Professor, PUC, School of Engineering, Department of Computer Science. 1992-2001.
- Honors: (a) First Honorary Member of the Chilean Computer Science Society (SCCC), 2003. (b) (b) Special Recognition of the Brazilian Computer Science Society, 2017. (c) Doctor Honoris Causa, Univ. Privada Antenor Orrego, Peru, 2015.
- PI and International Coordinator of STIC AMSUD Project “Declarative and Ontology-Enhanced Data Analytics and Machine Learning” with U. Paris V, U. Rennes, U. Buenos Aires, U. de la Republica (Uruguay), 2022-2023.
- “Adaptive Data Quality” Theme Leader. NSERC Strategic Network “Data Management for Business Intelligence” (BIN), Canada, 2008-12.

Some Recent Publications:

- M. Arenas, P. Barcelo, L. Bertossi and M. Monet. “On the Complexity of SHAP-Score-Based Explanations: Tractability via Knowledge Compilation and Non-Approximability Results”. *Journal of Machine Learning Research*, 2023, 24(63):1-58 (ext. version of AAAI’21 paper).
- L. Bertossi. “Declarative Approaches to Counterfactual Explanations for Classification”. *Theory and Practice of Logic Programming*, 2023, 23(3):559–593.
- L. Bertossi, B. Kimelfeld, E. Livshits and M. Monet. “The Shapley Value in Database Management”. *ACM Sigmod Record*, 2023, 52(2):6-17.
- L. Bertossi and M. Milani. “Extending Sticky-Datalog+ via Finite-Position Selection Functions: Tractability, Algorithms, and Optimization”. *Information Systems*, 2023, 114:102-156.
- L. Bertossi and J. E. Leon. “Efficient Computation of Shap Explanation Scores for Neural Network Classifiers via Knowledge Compilation”. Proc. of *Logic in AI (JELIA’23)*, Springer LNCS 14281, 2023.
- L. Bertossi. “Specifying and Computing Causes for Query Answers in Databases via Database Repairs and Repair Programs”. *Knowledge and Information Systems*, 2021, 63(1):199-231.
- E. Livshits, L. Bertossi, B. Kimelfeld and M. Sebag. “The Shapley Value of Tuples in Query Answering”. *Logical Methods in Computer Science*, 2021, 17(3):22.1-22.33.
- L. Bertossi and F. Geerts. “Data Quality and Explainable AI”. *Journal of Data and Information Quality*, 2020, 12(2):1-9.
- L. Bertossi and B. Salimi. “From Causes for Database Queries to Repairs and Model-Based Diagnosis and Back”. *Theory of Computing Systems*, 2017, 61(1):191-232.
- Z. Bahmani, L. Bertossi and N. Vasiloglou. “ERBlox: Combining Matching Dependencies with Machine Learning for Entity Resolution”. *International Journal of Approximate Reasoning*, 2017, 83:118-141.