

Michèle Sebag

Laboratoire de Recherche en Informatique
Université Paris-Sud Orsay
91405 Orsay Cedex
E-mail : Michele.Sebag@lri.fr
URL : <http://www.lri.fr/~sebag>

Educational Background

- HDR** Habilitation à Diriger des Recherches, Computer Science, 1997
Université Paris-Sud Orsay
Stochastic Heuristics for Machine Learning & Machine Learning for Stochastic Optimization
- PhD** Université Paris-IX Dauphine, Maths and Decision, 1990
A symbolic-numerical approach for supervised learning from examples and rules
Supervisors: Edwin Diday, Yves Kodratoff, Joseph Zarka
- ENS** Ecole Normale Supérieure (Sèvres), Maths, 1975
Agregation of Mathematics, 1980

Professional Experience in Industry

Consulting Engineer in Computer Science and Artificial Intelligence, 1985-1987.
Project Officer, Thomson-CSF (now Thales), 1982-1985.
Engineer, Thomson-CSF, 1980-1982.

Professional Experience in Research

Centre National de la Recherche Scientifique (CNRS):
Senior scientist (DR2 C.N.R.S.)
Head of the Inference and Learning Group
Lab. of Computer Science
Université Paris-Sud Orsay (since 2001)

Scientist (CR1 C.N.R.S)
co-Head of the Inverse Problem and Optimisation Group
Lab. of Mechanics of Solids
Ecole Polytechnique (1991-2001)

Responsibilities

Member of the editorial board of Machine Learning Journal (Springer Verlag), Genetic Programming and Evolvable Hardware (Springer Verlag); former Action Editor for IEEE Transactions on Evolutionary Computation (1998-2003); former Member of the editorial board of Knowledge and Information Systems, Springer (2003-2007),

Member of the Steering Committee of the PASCAL (Pattern Analysis, Statistical Modeling and Computational Learning) Network of Excellence, Manager of the Challenge Programme in Pascal; member of the Management Board of the KD-Ubiq (Ubiquitous Knowledge Discovery) Coordination Action.

Member of the Program Committee of the main conferences in Machine Learning and Evolutionary Computation (ICML, ECML, PKDD, ICDM, ILP, GECCO, PPSN), area chair for ICML 2009, 2008, 2005, ECML/PKDD 2008, 2005, program co-chair for ILP 2001, vice-chair of ICDM 2003.

President of the French Association for AI.

Supervision

- Olivier Bousquet (2002, Prix de thèse de l'Ecole Polytechnique),
- Jérôme Maloberti (2004),
- Alexandre Termier (2005, co-supervised with Marie-Christine Rousset),
- Jérémie Mary (2005, co-supervised with Antoine Cornuéjols),
- Sylvain Gelly (2007, co-supervised with Nicolas Bredèche; Prix de thèse de la Chancellerie des Universités; 2nd prix de thèse Gilles Kahn - Académie des Sciences),
- Nicolas Baskiotis (2008).
- On-going: Romaric Gaudel, Xiangliang Zhang, Philippe Rolet, Ouri Maler.

Selected Publications

- Editor [1, 2]
- Journals papers [3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
- Chapters [16, 17, 18, 19, 20, 21, 22, 23]
- International Conferences (selection on full papers) [24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 6, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81]

References

- [1] C. Rouveirol and M. Sebag (Eds). *Special Issue on Inductive Logic Programming and Relational Learning, Machine Learning Journal*. Kluwer Academic Publishers, 2004.
- [2] C. Rouveirol and M. Sebag (eds). *Proceedings of Eleventh International Conference on Inductive Logic Programming*. Springer Verlag, LNAI 2157, 2001.
- [3] A. Cornuéjols and Michèle Sebag. A note on phase transition and computational pitfalls of learning from sequences. *Journal of Intelligent Information Systems*, 31(2):177–189, 2008.
- [4] A. Termier, M-C. Rousset, Michèle Sebag, K. Ohara, T. Washio, and H. Motoda. Dryadeparent, an efficient and robust closed attribute tree mining algorithm. *IEEE Trans. on Knowledge and Data Engineering*, 20(3):300–320, March 2008.

- [5] J. Aze, M. Roche, Y. Kodratoff, and M. Sebag. Learning to order terms: supervised interestingness measures in terminology extraction. *International Journal on Computational Intelligence*, 1(2):98–102, 2005.
- [6] J. Maloberti and M. Sebag. Fast theta-subsumption with constraint satisfaction algorithms. *Machine Learning Journal*, 55:137–174, 2004.
- [7] M. Botta, A. Giordana, L. Saitta, and M. Sebag. Relational learning as search in a critical region. *Journal of Machine Learning Research*, 4:431–463, 2003.
- [8] H. Blockeel and M. Sebag. Scalability and efficiency in multi-relational data mining. *ACM SIGKDD, Special Issue on Multi-Relational Data Mining*, 5(1):17–30, 2003.
- [9] H. Hamda, F. Jouve, E. Lutton, M. Schoenauer, and M. Sebag. Compact unstructured representations in evolutionary topological optimum design. *Applied Intelligence*, 16, 2002.
- [10] A. Ratle and M. Sebag. Grammar-guided genetic programming and dimensional consistency: Application to non-parametric identification in mechanics. *Applied Soft Computing*, 8:1–14, 2001.
- [11] M. Sebag and C. Rouveirol. Resource-bounded relational reasoning: Induction and deduction through stochastic matching. *Machine Learning*, 38:41–62, 2000.
- [12] M. Sebag, M. Schoenauer, and M. Peyral. Revisiting the memory of evolution. *Fundamenta Informaticae*, 38:1–39, 1998.
- [13] M. Sebag and M. Schoenauer. Contrôle d’un algorithme génétique. *Revue d’Intelligence Artificielle*, 10(2-3):389–428, 1996.
- [14] O. Gascuel, P. Gallinari, and Et Al. Supervised classification : A comparison of twelve numerical symbolic and hybrid methods. *Int. Journal of Pattern Recognition and Artificial Intelligence*, 12(5):517–572, 1998.
- [15] M. Sebag, E. Diday, and M. Schoenauer. Incremental learning from symbolic objects. In M. Schader and W. Gaul, editors, *Knowledge, Data and Computer-Assisted Decisions, NATO ASI Series*, pages 77–90. Springer Verlag, Vol 61, 1990.
- [16] Rodolphe Le Riche, Marc Schoenauer, and Michèle Sebag. Un état des lieux de l’optimisation évolutionnaire et de ses implications en sciences pour l’ingénieur. In P. Breilkopf and C. Knopf-Lenoir, editor, *Modélisation Numérique: défis et perspectives, Traité Mécanique et Ingénierie des Matériaux*. Hermès, 2006.
- [17] M. Sebag. *Paradigmes et enjeux de l’informatique*, chapter Fouille de données, pages 137–156. Hermès, 2005.
- [18] M. Sebag. Genetic programming for model identification. In L. Györfi, editor, *Principles of non-parametric learning*, pages 287–354. Springer Wien New-York, 2002.
- [19] M. Sebag and P. Gallinari. Apprentissage artificiel : Acquis, limites, enjeux. In J. Le Maître, editor, *Assises 2002 : Information - Interaction - Intelligence*. Cépaduès, 2002.
- [20] M. Schoenauer and M. Sebag. Evolution artificielle et problèmes spatiaux. In H. Prade, R. Jeansoulin, and C. Garbay, editors, *Le temps, l’espace et l’évolutif en sciences du traitement de l’information*, pages 377–396. Cepadues, 2000.

- [21] M. Sebag, M. Schoenauer, and H. Maitournam. Parametric and non-parametric identification of macro-mechanical models. In D. Quadraglia, J. Périaux, C. Poloni, and G. Winter, editors, *Genetic Algorithms and Evolution Strategies in Engineering and Computer Sciences*, pages 327–340. John Wiley, 1997.
- [22] M. Schoenauer, M. Sebag, F. Jouve, B. Lamy, and H. Maitournam. Evolutionary identification of macro-mechanical models. In P. J. Angeline and Jr K. E. Kinnear, editors, *Advances in Genetic Programming II*, pages 467–488, Cambridge, MA, 1996. MIT Press.
- [23] M. Sebag and M. Schoenauer. Inductive learning of membership functions and fuzzy rules. In B. Ayyub and M.M. Gupta, editors, *Uncertainty Modeling : Theory and Applications, serie Machine Intelligence and Pattern Recognition*. North Holland, 1994.
- [24] Xiangliang Zhang, Cyril Furtlehner, and Michèle Sebag. Data Streaming with Affinity Propagation. In *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*, Antwerp Belgium, 2008.
- [25] Luis Da Costa, Alvaro Fialho, Marc Schoenauer, and Michèle Sebag. Adaptive Operator Selection with Dynamic Multi-Armed Bandits. In C. Ryan et al., editor, *Genetic and Evolutionary Computation Conference (GECCO)*, pages 913–920. ACM, ACM Press, 2008.
- [26] Alvaro Fialho, Luis Da Costa, Marc Schoenauer, and Michèle Sebag. Extreme Value Based Adaptive Operator Selection. In G. Rudolph et al., editor, *Parallel Problem Solving from Nature (PPSN’08)*, LNCS, pages 175–184. Springer, 2008.
- [27] Xiangliang Zhang, Michele Sebag, and Cecile Germain Renaud. Fault Detection and Diagnosis from the Logging and Bookkeeping Data. In *2nd EGEE User Forum*, Manchester Royaume-Uni, 2007.
- [28] Christian Gagné, Michèle Sebag, Marc Schoenauer, and Marco Tomassini. Ensemble Learning for Free with Evolutionary Algorithms ? In D. Thierens et al., editor, *Genetic and Evolutionary Computation Conference (GECCO)*, pages 1782–1789. ACM SIGEVO, ACM Press, 2007.
- [29] N. Baskiotis, M. Sebag, M.-C. Gaudel, and S.-D. Gouraud. A Machine Learning approach for Statistical Software Testing. In *Twentieth International Joint Conference on Artificial Intelligence*, pages 2274–2279, 01 2007.
- [30] V. Krmicek and Michele Sebag. Functional brain imaging with multi-objective multi-modal evolutionary optimization. In T. Runarsson et al., editor, *Parallel Problem Solving from Nature IX*, pages 382–391. Springer-Verlag, 2006.
- [31] Christian Gagne, Marc Schoenauer, Michele Sebag, and Marco Tomassini. Genetic programming for kernel-based learning with co-evolving subsets selection. In T. Runarsson et al., editor, *Parallel Problem Solving from Nature IX*, pages 1008–1017. Springer-Verlag, 2006.
- [32] M. Sebag, N. Tarrisson, O. Teytaud, S. Baillet, and J. Lefevre. A multi-objective multi-modal optimization approach for mining stable spatio-temporal patterns. In L. Kaelbling, editor, *Proc. Int. Conf. on Artificial Intelligence, IJCAI 2005*, pages 859–864. IOS Press, 2005.
- [33] N. Pernot, A. Cornuéjols, and M. Sebag. Phase transitions within grammatical inference. In L. Kaelbling, editor, *Proc. Int. Conf. on Artificial Intelligence, IJCAI 2005*, pages 811–816. IOS Press, 2005.

- [34] A. Termier, M.-C. Rousset, M. Sebag, K. Ohara, T. Washio, and Hiroshi Motoda. Efficient mining of high branching factor attribute trees. In *IEEE-Int. Conf. on Data Mining, ICDM05*, pages 785–788, 2005.
- [35] N. Baskiotis and M. Sebag. C4.5 competence map: a phase transition-inspired approach. In R. Greiner and D. Schuurmans, editors, *Proc. Int. Conf. on Machine Learning, ICML 2004*, pages 73–80. Morgan Kaufman, 2004.
- [36] Y. Semet, S. Gelly, M. Schoenauer, and M. Sebag. Artificial agents and speculative bubbles. In *Computational Finance and its Applications*, pages 35–44. Wessex Institute of Technology, WIT Press, 2004.
- [37] A. Termier, M.-C. Rousset, and M. Sebag. Dryade: a new approach for discovering closed frequent trees in heterogeneous tree databases. In *IEEE-Int. Conf. on Data Mining, ICDM04*, pages 543–546, 2004.
- [38] K. Jong, E. Marchiori, and M. Sebag. Ensemble learning with evolutionary computation: Application to feature ranking. In X. Yao et al., editor, *Parallel Problem Solving from Nature VIII*, pages 1133–1142. Springer-Verlag, LNCS 3242, 2004.
- [39] N. Godzik, M. Schoenauer, and M. Sebag. Robustness in the long run: Auto-teaching vs anticipation in evolutionary robotics. In X. Yao et al., editor, *Parallel Problem Solving from Nature VIII*, pages 932–941. Springer-Verlag, LNCS 3242, 2004.
- [40] K. Jong, J. Mary, A. Cornuejols, E. Marchiori, and M. Sebag. Ensemble feature ranking. In J.-F. Boulicaut, F. Esposito, F. Giannotti, and D. Pedreschi, editors, *Proc. Principles and Practice of Knowledge Discovery in Databases, PKDD 2004*, pages 267–278. Springer-Verlag, LNAI 3202, 2004.
- [41] N. Godzik, M. Schoenauer, and M. Sebag. Evolving symbolic controllers. In A. Guillot and J.A. Meyer, editors, *Proceedings of EvoRobot 2003*, pages 638–650. Springer Verlag LNCS 2611, 2003.
- [42] M. Sebag, J. Azé, and N. Lucas. Impact studies and sensitivity analysis in medical data mining with roc-based genetic learning. In *Proceedings of IEEE International Conference on Data Mining, ICDM03*, pages 637–640, 2003.
- [43] M. Sebag, J. Azé, and N. Lucas. Roc-based evolutionary learning: Application to medical data mining. In *Artificial Evolution'03*, pages 384–396. Springer Verlag LNCS 2936, 2004.
- [44] A. Termier, M.-C. Rousset, and M. Sebag. Treefinder: a first step towards xml data mining. In *Proceedings of IEEE International Conference on Data Mining, ICDM02*, pages 450–457, 2002.
- [45] A. Ratle and M. Sebag. A novel approach to machine discovery: Genetic programming and stochastic grammars. In Stan Matwin and Claude Sammut, editors, *Proc. of Inductive Logic Programming*, pages 207–222. Springer Verlag LNAI 2583, 2003.
- [46] J. Ales Bianchetti, C. Rouveirol, and M. Sebag. Constraint-based learning of long relational concepts. In C. Sammut, editor, *Proceedings of the 19th International Conference on Machine Learning*, pages 35–42. Morgan Kaufmann, 2002.
- [47] A. Ratle and M. Sebag. Avoiding the bloat with probabilistic grammar-guided genetic programming. In P. Collet et al., editor, *Artificial Evolution, VI*, pages 255–266. Springer Verlag, LNCS 2310, 2002.

- [48] J. Maloberti and M. Sebag. Theta-subsumption in a constraint satisfaction perspective. In *Proceedings of Inductive Logic Programming*, pages 164–178. Springer Verlag, LNAI 2157, 2001.
- [49] A. Ratle and M. Sebag. Genetic programming and domain knowledge: Beyond the limitations of grammar-guided machine discovery. In M. Schoenauer et al., editor, *Parallel Problem Solving from Nature, PPSN-VI*, pages 211–220. Springer Verlag, LNCS 1917, 2000.
- [50] A. Giordana, L. Saitta, M. Sebag, and M. Botta. Analyzing relational learning in the phase transition framework. In P. Langley, editor, *Proc. of the Seventeenth International Conference on Machine Learning*, pages 311–318. Morgan Kaufmann, 2000.
- [51] M. Sebag. Constructive induction: A version space based approach. In *Proc. of Int. Conf. on Artificial Intelligence*, pages 708–713. Morgan Kaufmann, 1999.
- [52] M. Sebag. From first-order logic to n^d : a data driven reformulation. In *European Symposium on Artificial Neural Networks*, pages 231–236. DFacto, 1999.
- [53] A. Rosete, A. Ochoa, and M. Sebag. Automatic graph drawing and stochastic hill-climbing. In *Proc. of the Genetic and Evolutionary Computation Conf.*, pages 1699–1706. Morgan Kaufmann, 1999.
- [54] M. Sebag and A. Ducoulombier. Extending population-based incremental learning to continuous search spaces. In Th. Bäck, G. Eiben, M. Schoenauer, and H.-P. Schwefel, editors, *Proceedings of the 5th Conference on Parallel Problems Solving from Nature*, pages 418–427. Springer Verlag, 1998.
- [55] A. Ducoulombier and M. Sebag. Continuous mimetic evolution. In C. Nedellec and C. Rouveirol, editors, *Proceedings of ECML-98, European Conference on Machine Learning*, pages 334–345. Springer Verlag, 1998.
- [56] M. Sebag. A stochastic simple similarity. In D. Page, editor, *Proceedings of Inductive Logic Programming-98*, pages 95–105. Springer Verlag, LNAI 1446, 1998.
- [57] M. Sebag, C. Rouveirol, and J.F. Puget. Induction of constraint logic programs. In A. Ghose G. Antonyou and M. Truszczynski, editors, *Learning and Reasoning with Complex Representations*, pages 148–167. Springer Verlag LNAI 1359, 1998.
- [58] M. Peyral, A. Ducoulombier, C. Ravisé, M. Schoenauer, and M. Sebag. Mimetic evolution. In J.-K. Hao, E. Lutton, E. Ronald, M. Schoenauer, and D. Snyers, editors, *Artificial Evolution'97*, LNCS, pages 71–79. Springer Verlag, 1997.
- [59] M. Sebag. Distance induction in FOL. In *Proceedings of ILP-97*, pages 264–272. Springer Verlag, LNCS 1297, 1997.
- [60] M. Sebag and C. Rouveirol. Tractable induction and classification in FOL. In *Proceedings of IJCAI-97*, pages 888–892. Morgan Kaufmann, 1997.
- [61] M. Sebag, M. Schoenauer, and C. Ravisé. Toward civilized evolution: Developing inhibitions. In Th. Bäck, editor, *Proceedings of the 7th International Conference on Genetic Algorithms*, pages 291–298. Morgan Kaufmann, 1997.
- [62] M. Sebag and C. Rouveirol. Polynomial-time learning in Logic Programming and Constraint Logic Programming. In S. Muggleton, editor, *Advances in ILP-II*, pages 105–126. Springer-Verlag, 1997.

- [63] C. Ravisé and M. Sebag. An advanced evolution should not repeat its past errors. In L. Saitta, editor, *Proceedings of the 13th International Conference on Machine Learning*, pages 400–408. Morgan Kaufmann, 1996.
- [64] M. Sebag. Delaying the choice of bias: A disjunctive version space approach. In L. Saitta, editor, *Proceedings of the 13th International Conference on Machine Learning*, pages 444–452. Morgan Kaufmann, 1996.
- [65] M. Sebag, C. Ravisé, and M. Schoenauer. Controlling evolution by means of machine learning. In L. J. Fogel, P. J. Angeline, and T. Bäck, editors, *Proceedings of the 5th Annual Conference on Evolutionary Programming*, pages 57–66. MIT Press, 1996.
- [66] M. Sebag and C. Rouveirol. Constraint inductive logic programming. In L. de Raedt, editor, *Advances in ILP*, pages 277–294. IOS Press, 1996.
- [67] M. Sebag and C. Rouveirol. Polynomial approximate learning in constraint logic programming. In S. Muggleton, editor, *Advances in ILP-II*, pages 105–126. Springer-Verlag, 1996.
- [68] M. Sebag and C. Rouveirol. Induction de clauses contraintes. In *Reconnaissance des Formes et Intelligence Artificielle*. AFCET, January 1996.
- [69] M. Sebag and M. Schoenauer. Mutation by imitation in boolean evolution strategies. In H.-M. Voigt, W. Ebeling, I. Rechenberg, and H.-P. Schwefel, editors, *Proceedings of the 4th Conference on Parallel Problems Solving from Nature*, pages 356–365. Springer-Verlag, LNCS 1141, 1996.
- [70] M. Sebag and C. Rouveirol. Constraint inductive logic programming. In L. de Raedt, editor, *Proceedings of ILP-95, International Workshop on Inductive Logic Programming*, pages 277–294. IOS Press, 1995.
- [71] M. Sebag, M. Schoenauer, and C. Ravisé. An induction-based control for genetic algorithms. In N. Lavrac and S. Wrobel, editors, *Proceedings of ECML-95, European Conference on Machine Learning*, pages 351–355. Springer Verlag, 1995.
- [72] M. Bulik, P. Navidi, and M. Sebag. Seismic protection: an artificial intelligence approach. In *Proceedings of the 2nd Franco Italian Symposium on Earthquake Engineering and Structural Dynamics*. Ouest Edition, Press Academics, 1994.
- [73] E. Ronald, M. Sebag, and M. Schoenauer. Feature induction by back-propagation. In *Proceedings of WCCI 94, IEEE Conference on Neural Networks*. IEEE Press, June 1994.
- [74] M. Sebag. Using constraints to building version spaces. In L. De Raedt and F. Bergadano, editors, *Proceedings of ECML-94, European Conference on Machine Learning*, pages 257–271. Springer Verlag, April 1994.
- [75] M. Sebag. A constraint-based induction algorithm in FOL. In W. Cohen and H. Hirsh, editors, *Proceedings of the 11th International Conference on Machine Learning*, pages 275–283. Morgan Kaufmann, July 1994.
- [76] M. Sebag. Une approche par contraintes de l’espace des versions. In *Reconnaissance des Formes et Intelligence Artificielle*. AFCET, February 1994.
- [77] M. Sebag and C. Rouveirol. Induction of maximally general clauses compatible with integrity constraints. In S. Wrobel, editor, *Proceedings of ILP-94, International Workshop on Inductive Logic Programming*, 1994.

- [78] M. Sebag and M. Schoenauer. A rule-based similarity measure. In S. Wess, K.-D. Althoff, and M. M. Richter, editors, *Topics in Case-Based Reasoning*, volume 837 of *LNCS*, pages 119–130. Springer Verlag, 1994.
- [79] M. Sebag and M. Schoenauer. Controlling crossover through inductive learning. In Y. Davidor, H.-P. Schwefel, and R. Manner, editors, *Proceedings of the 3rd Conference on Parallel Problems Solving from Nature*, pages 209–218. Springer-Verlag, LNCS 866, 1994.
- [80] M. Sebag and M. Schoenauer. Learning to control inconsistent knowledge. In B. Neumann, editor, *10th European Conference on Artificial Intelligence*, pages 479–483. Wiley, 1992.
- [81] M. Sebag and M. Schoenauer. Incremental learning of rules and meta-rules. In Porter B. and Mooney R., editors, *Proceedings of the 7th International Conference on Machine Learning*, pages 49–57. Morgan Kaufmann, 1990.