

# Trustworthy Machine Learning Through the Lens of Combinatorial Optimisation and Operations Research

## ONLINE TOOLS

- Blossom: an anytime algorithm for computing optimal decision trees.  
Link: <https://gitlab.laas.fr/ehebrard/blossom>
- FairCORELS: a Python library for learning fair and interpretable models.  
Link: <https://github.com/ferryjul/fairCORELSV2>
- BDD Encoding: a Python library to learning binary decision diagrams.  
Link: <https://gitlab.laas.fr/roc/hao-hu/bddencoding>
- MaxSAT Decision Trees: a Python library to learning decision trees.  
Link: <https://gitlab.laas.fr/roc/hao-hu/maxsat-decision-trees>

## LIST OF PUBLICATIONS

### 2025

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| TRANSACTIONS<br>ON MACHINE<br>LEARNING<br>RESEARCH | Fabian Akkerman, Julien Ferry, Christian Artigues, Emmanuel Hebrard, and Thibaut Vidal. Boosting revisited: Benchmarking and advancing lp-based ensemble methods. <i>Transactions on Machine Learning Research</i> , 2025  |
| ECML PKDD<br>2025                                  | Mohamed Siala, Jordi Planes, and João Marques-Silva. On trustworthy rule-based models and explanations. In <i>Machine Learning and Knowledge Discovery in Databases. Research Track - European Conference, ECML PKDD 2025, Porto, Portugal, September 15-19, 2025, Proceedings, Part IV</i> . Springer, 2025 |
| COMPUTATIONAL<br>INTELLIGENCE                      | Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Taming the triangle: On the interplays between fairness, interpretability, and privacy in machine learning. <i>Computational Intelligence</i> , 2025  |

### 2024

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| SATML 2024 | Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Probabilistic dataset reconstruction from interpretable models. In <i>IEEE Conference on Secure and Trustworthy Machine Learning, SaTML 2024, Toronto, ON, Canada, April 9-11, 2024</i> , pages 1–17. IEEE, 2024 |
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### 2023

Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Improving fairness generalization through a sample-robust optimization method. *Mach. Learn.*, 112(6):2131–2192, 2023

ICML 2023

Emir Demirovic, Emmanuel Hebrard, and Louis Jean. Blossom: an anytime algorithm for computing optimal decision trees. In *International Conference on Machine Learning, ICML 2023, 23-29 July 2023, Honolulu, Hawaii, USA*, volume 202 of *Proceedings of Machine Learning Research*, pages 7533–7562. PMLR, 2023

SATML 2023

Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Exploiting fairness to enhance sensitive attributes reconstruction. In *2023 IEEE Conference on Secure and Trustworthy Machine Learning, SaTML 2023, Raleigh, NC, USA, February 8-10, 2023*, pages 18–41. IEEE, 2023

## 2022

JOURNAL OF  
MACHINE  
LEARNING  
RESEARCH

Emir Demirovic, Anna Lukina, Emmanuel Hebrard, Jeffrey Chan, James Bailey, Christopher Leckie, Kotagiri Ramamohanarao, and Peter J. Stuckey. Murtree: Optimal decision trees via dynamic programming and search. *J. Mach. Learn. Res.*, 23:26:1–26:47, 2022

AAAI 2022

Hao Hu, Marie-José Huguet, and Mohamed Siala. Optimizing binary decision diagrams with maxsat for classification. In *Thirty-Sixth AAAI Conference on Artificial Intelligence, AAAI 2022, Thirty-Fourth Conference on Innovative Applications of Artificial Intelligence, IAAI 2022, The Twelveth Symposium on Educational Advances in Artificial Intelligence, EAAI 2022 Virtual Event, February 22 - March 1, 2022*, pages 3767–3775. AAAI Press, 2022

CPAIOR 2022

Ulrich Aïvodji, Julien Ferry, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Leveraging integer linear programming to learn optimal fair rule lists. In *Integration of Constraint Programming, Artificial Intelligence, and Operations Research - 19th International Conference, CPAIOR 2022, Los Angeles, CA, USA, June 20-23, 2022, Proceedings*, volume 13292 of *Lecture Notes in Computer Science*, pages 103–119. Springer, 2022

ICTAI 2022

Julien Rouzot, Julien Ferry, and Marie-José Huguet. Learning optimal fair scoring systems for multi-class classification. In *34th IEEE International Conference on Tools with Artificial Intelligence, ICTAI 2022, Macao, China, October 31 - November 2, 2022*, pages 197–204. IEEE, 2022

## 2021

CIKM 2021

Ulrich Aïvodji, Julien Ferry, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. Faircorels, an open-source library for learning fair rule lists. In *CIKM '21: The 30th ACM International Conference on Information and Knowledge Management, Virtual Event, Queensland, Australia, November 1 - 5, 2021*, pages 4665–4669. ACM, 2021

## 2020

IJCAI 2020

Hao Hu, Mohamed Siala, Emmanuel Hebrard, and Marie-José Huguet. Learning optimal decision trees with maxsat and its integration in adaboost. In *Proceedings of the Twenty-Ninth*

*International Joint Conference on Artificial Intelligence, IJCAI 2020*, pages 1170–1176. [ijcai.org](http://ijcai.org), 2020

CP 2020

Alexey Ignatiev, Martin C. Cooper, Mohamed Siala, Emmanuel Hebrard, and João Marques-Silva. Towards formal fairness in machine learning. In *Principles and Practice of Constraint Programming - 26th International Conference, CP 2020, Louvain-la-Neuve, Belgium, September 7-11, 2020, Proceedings*, volume 12333 of *Lecture Notes in Computer Science*, pages 846–867. Springer, 2020