Dr. Mohamed Siala

Associate Professor of Computer Science

INSA Toulouse and LAAS-CNRS, France

✉ sia.mohamed@gmail.com   —   🌐 siala.github.io   —   🎓 Google Scholar

Research Interests: Combinatorial Optimisation, Automated Reasoning, and Machine Learning

Education

Ph.D. in Computer Science   2012 – 2015
Université fédérale Toulouse Midi-Pyrénées, France
Dissertation: Search, Propagation, and Learning in Sequencing and Scheduling Problems
Funding: Google and the Midi-Pyrénées Regional Council
Advisors: Dr. Emmanuel Hebrard and Dr. Christian Artigues

M.S. in Artificial Intelligence and Decision Making   2010 – 2012
ENSI, Manouba, Tunisia

Computer Engineering Diploma   2007 – 2010
ENSI, Manouba, Tunisia

Academic Appointments

Associate Professor   2018 – Present
INSA Toulouse and LAAS-CNRS, France

Postdoctoral Researcher   2015 – 2018
Insight Centre for Data Analytics, University College Cork, Ireland
Advisor: Prof. Barry O'Sullivan

Ph.D. Teaching Fellow   2012 – 2014
INSA Toulouse, France

Awards & Honours

- **Honourable Mention for the Best Ph.D. Thesis Award in AI**   2016
  The European Association for Artificial Intelligence (EurAI)

- **International Constraint Programming Competitions**   2017 – 2023
  Mistral-2.0, an open-source solver that won multiple awards in the XCSP Competition and
  the MiniZinc Challenge

- **Honourable Mention for the Best Paper Award**   2012
  International Conference on Principles and Practice of Constraint Programming (CP)

Grants & Funding

INSA Toulouse Mobility Grant   2024
Three-month research visit to the University of Lleida, Spain
Total Award: €6,000 — Role: Visiting Researcher

Centre International de Mathématiques et Informatique de Toulouse   2022 – 2024
Interactive Combinatorial Optimisation under Uncertainty
Total Award: €20,000 — Role: Principal Investigator

EDMITT Doctoral School Ph.D. Scholarship   2020 – 2023
Ph.D. Scholarship for Julien Ferry
Total Award: €80,000 — Role: Co-supervisor

EDMITT Doctoral School Ph.D. Scholarship   2019 – 2022
Ph.D. Scholarship for Hao Hu
Total Award: €80,000 — Role: Co-supervisor

Centre International de Mathématiques et Informatique de Toulouse   2019 – 2023
Operational Research for Fairness, Privacy and Interpretability in Machine Learning
Total Award: €20,000 — Role: Co-Principal Investigator

LAAS-CNRS Starting Grant   2019 – 2021
Institutional Research Support
Total Award: €20,000 — Role: Principal Investigator

INSA Toulouse Starting Grant   2019 – 2020
Institutional Research Support
Total Award: €3,000 — Role: Principal Investigator

EDSYS Mobility Grant   2013
One-month research visit to UNSW and NICTA, Sydney
Total Award: €1,500 — Role: Visiting Researcher

Advising & Supervision

Doctoral Supervision (3 completed Ph.D.s)
- **Julien Ferry** (2020–2023): *Addressing Interpretability, Fairness & Privacy in Machine Learning.*
- **Hao Hu** (2019–2022): *Interpretable Machine Learning Models via MaxSAT.*
- **Begum Genc** (2016–2019): *Robustness in Stable Marriage Problems.*

Master's Supervision: Supervised 10+ Master's students.

Research Projects

- **ANITI (Artificial & Natural Intelligence Toulouse Institute)**   2020 – 2022
  Deep Learner Explanation & Verification Chair
  https://aniti.univ-toulouse.fr/en/chaire-joao-silva-marques/
  Role: Collaborator
- **UTRC–UCC–OTIS Industrial Research Project**   2017 – 2018
  Insight Centre for Data Analytics, University College Cork (Ireland).
  Collaboration with United Technologies Research Center (UTRC) and OTIS (Canada).
  Topic: Machine Learning and Combinatorial Optimisation for planning, scheduling, and
  real-time rescheduling of service routes (travelling repair person problem) under customer
  preferences and stochastic events.
  Role: Researcher.
- **Science Foundation Ireland (SFI)**   2015 – 2018
  Grants 12/RC/2289 & 16/RC/3918 (co-funded by the European Regional Development Fund)
  Solver Optimisation
  Role: Researcher
- **Google and Midi-Pyrénées Region Research Grant**   2011 – 2014
  Hybrid approaches for solving sequencing and scheduling problems
  Role: Ph.D. Fellow

Scientific Research Visits

Dagstuhl Seminar (Invited Participant) 2025
Interactions in Constraint Optimization
https://www.dagstuhl.de/en/seminars/seminar-calendar/seminar-details/25371

University of Lleida, Spain October 2024
Three-month research visit
Collaboration with Prof. João Marques Silva and Dr. Jordi Planes

UQAM, Montréal, Canada May 2022
Six-week research visit
Collaboration with Prof. Sébastien Gambs and Dr. Ulrich Aïvodji

University College Cork, Ireland February 2020
Two-week research visit to the Department of Philosophy

NICTA, UNSW, Sydney, Australia January 2013
One-month research visit
Collaboration with Prof. Toby Walsh and Dr. Nina Narodytska

Professional Service

Leadership Roles
- Co-Chair, Joint CP/SAT Doctoral Program 2026
- DEI Co-Chair, CP Conference 2025 – 2027
  CP 2025 and CP 2026
- Masterclass Co-Chair, CPAIOR 2020 2020
  Recent Advances in Optimisation Paradigms and Solving Technology

Program Committee Membership
- *IJCAI*: PC Member (2019 – 2025)
- *AAAI*: PC Member (2020 – 2022, 2024)
- *CP*: PC Member (2017 – 2025)
- *CPAIOR*: PC Member (2014, 2016, 2021 – 2025)
- *ECAI*: PC Member (2025)

Journal Reviewing
- Reviewer, *Journal of Artificial Intelligence Research (JAIR)* 2019 – 2020, 2024 – 2025
- Reviewer, *Constraints* 2020, 2022 – 2023
- Reviewer, *ACM Computing Surveys* 2022

University Service
- Academic Advisor & Coordinator 2020 – 2023
  Distributed Systems & Big Data Major, *INSA Toulouse*
- Member, Student Admission Committee, *INSA Toulouse* 2019 – 2023
- Organizer, ROC Seminar Series 2019 – 2021
- Organizer, Insight Seminar Series 2016 – 2018
- Ph.D. Student Coordinator, ROC, *LAAS-CNRS* 2012 – 2014

Invited Expertise
- Expert reviewer for research grant applications: "Pionniers de l'IA" (2025)

Miscellaneous

Other Awards & Distinctions

- PEDR (France) — National merit-based excellence allowance awarded for sustained research quality and doctoral supervision (*Prime d'encadrement doctoral et de recherche*), term: 2020–2024
- RIPEC C3 (France) — National merit-based individual excellence allowance (RIPEC *Prime individuelle*) awarded for research excellence and scientific contributions, term: 2024–2027
- CRCT (INSA Toulouse, France) — Six-month research award (CRCT), granting full relief from teaching and administrative duties   September 2024
- Distinguished Program Committee Member, *IJCAI*   2019
- Finalist for the *ROADEF Young Researcher Award*   2014
- Doctoral Program Scholarship, *CP Conference*   2012

Selected Outreach
- Science Outreach, "The Art of Decision-Making", *Science Festival Toulouse*   2013

Invited Talks

- **GDR RO, CNAM Paris**   April 2026
  Trustworthy Machine Learning via Combinatorial Optimisation and Automated Reasoning
- **Polytechnique Montréal**   May 2022
  Declarative Combinatorial Optimisation for Machine Learning
- **UCC, Cork**   January 2020
  Computational Thinking for Philosophers
- **NICTA & UNSW, Sydney**   January 2013
  An optimal Arc Consistency Algorithm for a Chain of AtMost Constraints with Cardinality

List of Publications

2025

- [**ECML PKDD 25**] Mohamed Siala, Jordi Planes, and João Marques-Silva. "On Trustworthy Rule-Based Models and Explanations". In: *Machine Learning and Knowledge Discovery in Databases. Research Track - European Conference, ECML PKDD 2025, Porto, Portugal, September 15-19, 2025, Proceedings, Part IV*. ed. by Rita P. Ribeiro, Bernhard Pfahringer, Nathalie Japkowicz, Pedro Larrañaga, Alípio M. Jorge, Carlos Soares, Pedro H. Abreu, and João Gama. Vol. 16016. Lecture Notes in Computer Science. Springer, 2025, pp. 166–184
- [**Computational Intelligence 25**] 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". In: *Computational Intelligence* 41.4 (2025)

2024

- [**SaTML 24**] Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. "Probabilistic Dataset Reconstruction from Interpretable Models". In: *IEEE Conference on Secure and Trustworthy Machine Learning, SaTML 2024, Toronto, ON, Canada, April 9-11, 2024*. IEEE, 2024, pp. 1–17

2023

- [**Machine Learning 23**] Julien Ferry, Ulrich Aïvodji, Sébastien Gambs, Marie-José Huguet, and Mohamed Siala. "Improving fairness generalization through a sample-robust optimization method". In: *Machine Learning* 112.6 (2023), pp. 2131–2192

- **[SaTML 23]** 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.* IEEE, 2023, pp. 18–41

2022

- **[AAAI 22]** 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 Twelfth Symposium on Educational Advances in Artificial Intelligence, EAAI 2022 Virtual Event, February 22 - March 1, 2022.* AAAI Press, 2022, pp. 3767–3775
- **[CPAIOR 22]** 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.* Ed. by Pierre Schaus. Vol. 13292. Lecture Notes in Computer Science. Springer, 2022, pp. 103–119

2021

- **[CIKM 21]** 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.* Ed. by Gianluca Demartini, Guido Zuccon, J. Shane Culpepper, Zi Huang, and Hanghang Tong. ACM, 2021, pp. 4665–4669

2020

- **[CP 20]** 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.* Ed. by Helmut Simonis. Vol. 12333. Lecture Notes in Computer Science. Springer, 2020, pp. 846–867
- **[IJCAI 20]** 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.* Ed. by Christian Bessiere. ijcai.org, 2020, pp. 1170–1176
- **[IJAIT 20]** Mark Antunes, Vincent Armant, Kenneth N. Brown, Daniel A. Desmond, Guillaume Escamocher, Anne-Marie George, Diarmuid Grimes, Mike O'Keeffe, Yiqing Lin, Barry O'Sullivan, Cemalettin Ozturk, Luis Quesada, Mohamed Siala, Helmut Simonis, and Nic Wilson. "Assigning and Scheduling Service Visits in a Mixed Urban/Rural Setting". In: *International Journal on Artificial Intelligence Tools* 29.03n04 (2020), 2060007:1–2060007:31

2019

- **[IPL 19]** Mohamed Siala and Barry O'Sullivan. "Combinatorial search from an energy perspective". In: *Information Processing Letters* 148 (2019), pp. 23–27

- [**TCS 19**] Begum Genc, Mohamed Siala, Gilles Simonin, and Barry O'Sullivan. "Complexity Study for the Robust Stable Marriage Problem". In: *Theoretical Computer Science* 775 (2019), pp. 76–92
- [**CPAIOR 19**] Begum Genc, Mohamed Siala, Gilles Simonin, and Barry O'Sullivan. "An Approach to Robustness in the Stable Roommates Problem and Its Comparison with the Stable Marriage Problem". In: *Integration of Constraint Programming, Artificial Intelligence, and Operations Research - 16th International Conference, CPAIOR 2019, Thessaloniki, Greece, June 4-7, 2019, Proceedings.* Ed. by Louis-Martin Rousseau and Kostas Stergiou. Vol. 11494. Lecture Notes in Computer Science. Springer, 2019, pp. 320–336

2018

- [**CPAIOR 18**] Guillaume Escamocher, Mohamed Siala, and Barry O'Sullivan. "From Backdoor Key to Backdoor Completability: Improving a Known Measure of Hardness for the Satisfiable CSP". in: *Integration of Constraint Programming, Artificial Intelligence, and Operations Research - 15th International Conference, CPAIOR 2018, Delft, The Netherlands, June 26-29, 2018, Proceedings.* Ed. by Willem Jan van Hoeve. Vol. 10848. Lecture Notes in Computer Science. Springer, 2018, pp. 198–214
- [**ICTAI 18**] Mark Antunes, Vincent Armant, Kenneth N. Brown, Daniel A. Desmond, Guillaume Escamocher, Anne-Marie George, Diarmuid Grimes, Mike O'Keeffe, Yiqing Lin, Barry O'Sullivan, Cemalettin Ozturk, Luis Quesada, Mohamed Siala, Helmut Simonis, and Nic Wilson. "Assigning and Scheduling Service Visits in a Mixed Urban/Rural Setting". In: *IEEE 30th International Conference on Tools with Artificial Intelligence, ICTAI 2018, 5-7 November 2018, Volos, Greece.* Ed. by Lefteri H. Tsoukalas, Éric Grégoire, and Miltiadis Alamaniotis. IEEE, 2018, pp. 114–121

2017

- [**CPAIOR 17**] Emmanuel Hebrard and Mohamed Siala. "Explanation-Based Weighted Degree". In: *Integration of AI and OR Techniques in Constraint Programming - 14th International Conference, CPAIOR 2017, Padua, Italy, June 5-8, 2017, Proceedings.* Ed. by Domenico Salvagnin and Michele Lombardi. Vol. 10335. Lecture Notes in Computer Science. Springer, 2017, pp. 167–175
- [**ICTAI 17**] Danuta Sorina Chisca, Mohamed Siala, Gilles Simonin, and Barry O'Sullivan. "New Models for Two Variants of Popular Matching". In: *29th IEEE International Conference on Tools with Artificial Intelligence, ICTAI 2017, Boston, MA, USA, November 6-8, 2017.* IEEE Computer Society, 2017, pp. 752–759
- [**IJCAI 17**] Begum Genc, Mohamed Siala, Barry O'Sullivan, and Gilles Simonin. "Finding Robust Solutions to Stable Marriage". In: *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence, IJCAI 2017, Melbourne, Australia, August 19-25, 2017.* Ed. by Carles Sierra. ijcai.org, 2017, pp. 631–637

2016

- [**CPAIOR 16**] Mohamed Siala and Barry O'Sullivan. "Revisiting Two-Sided Stability Constraints". In: *Integration of AI and OR Techniques in Constraint Programming - 13th International Conference, CPAIOR 2016, Banff, AB, Canada, May 29 - June 1, 2016, Proceedings.* Ed. by Claude-Guy Quimper. Vol. 9676. Lecture Notes in Computer Science. Springer, 2016, pp. 342–357

- [**Constraints 16**] Nina Narodytska, Thierry Petit, Mohamed Siala, and Toby Walsh. "Three generalizations of the FOCUS constraint". In: *Constraints An International Journal* 21.4 (2016), pp. 495–532

2015

- [**CP 15**] Mohamed Siala, Christian Artigues, and Emmanuel Hebrard. "Two Clause Learning Approaches for Disjunctive Scheduling". In: *Principles and Practice of Constraint Programming - 21st International Conference, CP 2015, Cork, Ireland, August 31 - September 4, 2015, Proceedings.* Ed. by Gilles Pesant. Vol. 9255. Lecture Notes in Computer Science. Springer, 2015, pp. 393–402
- [**EAAI 15**] Mohamed Siala, Emmanuel Hebrard, and Marie-José Huguet. "A study of constraint programming heuristics for the car-sequencing problem". In: *Engineering Applications of Artificial Intelligence* 38 (2015), pp. 34–44

2014

- [**Constraints 14**] Mohamed Siala, Emmanuel Hebrard, and Marie-José Huguet. "An optimal arc consistency algorithm for a particular case of sequence constraint". In: *Constraints An Int. J.* 19.1 (2014), pp. 30–56
- [**CPAIOR 14**] Christian Artigues, Emmanuel Hebrard, Valentin Mayer-Eichberger, Mohamed Siala, and Toby Walsh. "SAT and Hybrid Models of the Car Sequencing Problem". In: *Integration of AI and OR Techniques in Constraint Programming - 11th International Conference, CPAIOR 2014, Cork, Ireland, May 19-23, 2014. Proceedings.* Ed. by Helmut Simonis. Vol. 8451. Lecture Notes in Computer Science. Springer, 2014, pp. 268–283

2013

- [**IJCAI 13**] Nina Narodytska, Thierry Petit, Mohamed Siala, and Toby Walsh. "Three Generalizations of the FOCUS Constraint". In: *IJCAI 2013, Proceedings of the 23rd International Joint Conference on Artificial Intelligence, Beijing, China, August 3-9, 2013.* Ed. by Francesca Rossi. IJCAI/AAAI, 2013, pp. 630–636

2012

- [**CP 12**] Mohamed Siala, Emmanuel Hebrard, and Marie-José Huguet. "An Optimal Arc Consistency Algorithm for a Chain of Atmost Constraints with Cardinality". In: *Principles and Practice of Constraint Programming - 18th International Conference, CP 2012, Québec City, QC, Canada, October 8-12, 2012. Proceedings.* Ed. by Michela Milano. Vol. 7514. Lecture Notes in Computer Science. Springer, 2012, pp. 55–69