Curriculum Vitae

Joao Marques-Silva

Directeur de Recherche
Centre National de la Recherche Scientifique (CNRS), France
E-mail: jpms@ieee.org, jpms@acm.org

March 2023

Education

Technical University of Lisbon, Lisbon, Portugal

Feb. 2004. Habilitation Degree in Computer Science.

University of Michigan, Ann Arbor, MI, USA

1991-1995. Ph.D. in Electrical Engineering and Computer Science.

Instituto Superior Técnico, Lisbon, Portugal

1988-1991. M.Sc. in Electrical and Computer Engineering.

1983-1988. Engineer Degree in Electrical and Computer Engineering.

Employment / Affiliations (since 2005)

Centre National de la Recherche Scientifique (CNRS), France

Oct. 2020-date. Directeur de Recherche (Senior Researcher), affiliated with IRIT, Toulouse, France.

Artificial and Natural Intelligence Toulouse Institute (ANITI), Toulouse, France

Sep. 2019-date. Head of the Chair Deep Learner Explanation and Verification (DeepLever), coordinating a team of more than 10 people.

Faculty of Science, University of Lisbon, Portugal

Dec. 2015-Sep. 2019. Full Professor, Department of Informatics.

Instituto Superior Técnico, University of Lisbon, Portugal

Sep. 2009-Dec. 2015. Full Professor, Department of Informatics Engineering.

University College Dublin, Dublin, Ireland

Jan. 2009-Aug. 2015. SFI Stokes Professor of Computer Science and Informatics, School of Computer Science and Informatics, and Complex Adaptive Systems Laboratory.

University of Southampton, Southampton, UK

Sep. 2007-Jan. 2009. Professor of Computer Science, Dependable Systems and Software Engineering, School of Electronics and Computer Science.

Oct. 2005-Aug. 2007. Senior Lecturer, Dependable Systems and Software Engineering, School of Electronics and Computer Science.

LASIGE, Faculty of Science, University of Lisbon, Lisbon, Portugal

Dec. 2015-May. 2018. Integrated member of LASIGE, co-founder and coordinator of the research line *Data and Systems Intelligence*.

INESC-ID, Lisbon, Portugal

Oct. 2010-Dec. 2015. Co-coordinator, senior researcher of the research group Software Algorithms and Tools for Constraint Solving (SAT) at INESC-ID.

Temporary Affiliations

University College Dublin, Dublin, Ireland

Sep. 2015-Aug. 2020. Visiting Professor, School of Computer Science.

Univ. Calabria, Cosenza, Italy

Feb. 2015. Invited Visiting Scholar.

Microsoft Research, Cambridge, UK

Jan. 2011-Mar. 2011. Invited Visiting Researcher.

University of Southampton, Southampton, UK

2009-2013. Visiting Professor of Computer Science, Dependable Systems and Software Engineering, School of Electronics and Computer Science.

INESC-ID, Lisbon, Portugal

Oct. 2005-Sep. 2010. Visiting researcher of the research group Software Algorithms and Tools for Constraint Solving (SAT) at INESC-ID.

Instituto Superior Técnico, University of Lisbon, Portugal

Nov. 2005-Sep. 2006. Visiting Associate Professor, Department of Informatics Engineering.

Publications

DBLP maintains an up-to-date list of publications. Table 1 summarizes the top journal and conference publications over the last decade.

Books (Since 2007)

1. J. Marques-Silva and K. Sakallah, Eds. "10th International Conference on Theory and Applications of Satisfiability Testing," Lecture Notes in Computer Science (LNCS), vol. 4501, Springer, May 2007.

Book Chapters (Since 2007)

1. J. Marques-Silva, I. Lynce and S. Malik, "Conflict-Driven Clause Learning SAT Solvers," in A. Biere, M. Heule, H. van Maaren and T. Walsh, Eds., *Handbook of Satisfiability*, 2nd Edition, IOS Press, 2019. (In Press)
2. J. Marques-Silva, and S. Malik, "Propositional SAT Solving," in E. Clarke, T. Henzinger, H. Veith, R. Bloem Eds., *Handbook of Model Checking*, Springer, ISBN: 978-3-319-10574-1, 2018.
3. J. Marques-Silva, and I. Lynce, "SAT Solvers," in L. Bordeaux, Y. Hamadi, P. Kohli, R. Mateescu, Eds., *Tractability*, Cambridge University Press, 2013.
4. H. Chen, J. Marques-Silva. "Improvements to Satisfiability-Based Boolean Function Bi-Decomposition," VLSI-SoC: Advanced Research for System on Chip (Best Papers of VLSI-SoC 2011), 2012.
5. A. Graça, J. Marques-Silva, and I. Lynce, "Haplotype Inference using Propositional Satisfiability," in R. Bruni Ed., *Mathematical Approaches to Polymer Sequence Analysis*, Springer, ISBN: 978-1-4419-6799-2, 2011.
6. J. Marques-Silva, and J. Planes, "Unsatisfiability-Based Maximum Satisfiability," in S. Khatri and K. Gulati Eds., *Advances in Logic Synthesis*, Springer, ISBN: 978-1-4419-7517-1, 2010.
7. J. Marques-Silva, "Boolean Satisfiability and EDA Applications," in I. Harris and D. Pradhan, Eds., *Practical Design Verification*, Cambridge University Press, ISBN: 978-0-5218-5972-1, 2009.
8. J. Marques-Silva, I. Lynce and S. Malik, "Conflict-Driven Clause Learning SAT Solvers," in A. Biere, M. Heule, H. van Maaren and T. Walsh, Eds., *Handbook of Satisfiability*, IOS Press, ISBN: 978-1-58603-929-5, 2009.
9. I. Lynce, V. Manquinho and J. Marques-Silva, "Backtracking," in B. Wah, Ed., *Encyclopedia of Computer Science and Engineering*, John Wiley & Sons, ISBN: 978-0-471-38393-2, 2009.

Journal Articles – Published/In Press (Since 2007)

1. M. C. Cooper and J. Marques-Silva. "Tractability of explaining classifier deci- sions". In: Artif. Intell. (2023). In Press. URL: https://www.sciencedirect.com/science/article/pii/S0004370222001813.
2. Y. Izza, A. Ignatiev, and J. Marques-Silva. "On Tackling Explanation Redun- dancy in Decision Trees". In: J. Artif. Intell. Res. 75 (2022), pp. 261-321. URL: https://doi.org/10.1613/jair.1.13575.
3. M. L. Bonet, S. Buss, A. Ignatiev, A. Morgado, and Joao Marques- Silva. "Propositional proof systems based on maximum satisfiability". In: Artif. Intell. 300 (2021), p. 103552. URL: https://doi.org/10.1016/j.artint.2021.103552.
4. D. Gibert, C. Mateu, J. Planes, and J. Marques-Silva. "Auditing static machine learning anti-Malware tools against metamorphic attacks". In: Comput. Secur. 102 (2021), p. 102159. URL: https://doi.org/10.1016/j.

cose.2020.102159.

5. M. Alviano, C. Dodaro, J. Marques-Silva, and F. Ricca. "Optimum stable model search: algorithms and implementation". In: J. Log. Comput. 30.4 (2020), pp. 863-897. URL: https://doi.org/10.1093/logcom/exv061.
6. L. Cruz-Filipe, J. Marques-Silva, P. Schneider-Kamp, "Formally Verifying the Solution to the Boolean Pythagorean Triples Problem," Journal of Automated Reasoning, In Press, 2019. (Available from https://rdcu.be/bahTS.)
7. A. Ignatiev, A. Morgado, J. Marques-Silva, "RC2: an Efficient MaxSAT Solver," Journal on Satisfiability, Boolean Modeling and Computation, In Press, 2019.
8. J. Marques-Silva, M. Janota, C. Mencia, "Minimal Sets on Propositional Formulae," Artificial Intelligence, vol. 252, pp. 22-50, 2017.
9. T. Saber, J. Marques-Silva, J. Thorburn, A. Ventresque: Exact and Hybrid Solutions for the Multi-Objective VM Reassignment Problem. International Journal on Artificial Intelligence Tools, vol. 26, no. 1, pp. 1-36, 2017.
10. M. Janota and J. Marques-Silva, "On Query Complexity of Selecting Minimal Sets for Monotone Predicates," Artificial Intelligence, vol. 233, pp. 73-83, 2016.
11. M. Janota, W. Klieber, J. Marques-Silva, E. Clarke, "Solving QBF with Counterexample Guided Refinement," Artificial Intelligence, vol. 234, pp. 1-25, 2016.
12. M. Liffiton, A. Previti, A. Malik and J. Marques-Silva, "Fast, Flexible MUS Enumeration," Constraints: An International Journal, vol. 21, no. 2, pp. 223-250, 2016.
13. A. Ignatiev, M. Janota and J. Marques-Silva, "Quantified Maximum Satisfiability," Constraints: An International Journal, vol. 21, no. 2, pp. 277-302, 2016.
14. A. Ignatiev, A. Morgado, J. Planes and J. Marques-Silva, "Maximal Falsifiability: Definitions, Algorithms, and Applications," AI Communications, vol. 29, no. 2, pp. 351-370, 2016.
15. M. Janota and J. Marques-Silva, "Expansion-based QBF Solving versus Q-Resolution," Theoretical Computer Science, vol. 577, pp. 25-42, 2015.
16. M. Janota, I. Lynce and J. Marques-Silva, "Algorithms for Computing Backbones of Propositional Formulae," AI Communications, vol. 28, no. 2, pp. 161-177, 2015.
17. F. Heras, I. Morgado and J. Marques-Silva, "MaxSAT-Based Encodings for Group MaxSAT," AI Communications, vol. 28, no. 2, pp. 195-214, 2015.
18. A. Ignatiev, A. Morgado and J. Marques-Silva, "MSCG: Robust Core-Guided MaxSAT Solving, System Description," Journal on Satisfiability, Boolean Modeling and Computation, vol. 9, pp. 129-134, 2015.
19. A. Belov, M. Janota, I. Lynce and J. Marques-Silva, "Algorithms for Computing Minimal Equivalent Subformulas," Artificial Intelligence, vol. 32, pp. 309-326, 2014.
20. A. Morgado, F. Heras, M. Liffiton, J. Planes, and J. Marques-Silva, "Iterative and Core-Guided MaxSAT Solving: A Survey and Assessment," Constraints: An International Journal, vol. 18, no. 4, pp. 478-534, 2013.
21. H. Chen and J. Marques-Silva, "A Two-Variable Model for SAT-Based ATPG," IEEE Trans. on CAD of Integrated Circuits and Systems, vol. 32, no. 12, pp. 1943-1956, 2013.
22. F. Letombe and J. Marques-Silva, "Hybrid Incremental Algorithms for Boolean Satisfiability," International Journal on Artificial Intelligence Tools, vol. 21, no. 6, 2012.
23. A. Belov, and J. Marques-Silva, "MUSer2: An Efficient MUS Extractor, System Description," Journal on Satisfiability, Boolean Modeling and Computation, vol. 8, pp. 123-128, 2012.
24. A. Belov, I. Lynce, and J. Marques-Silva, "Towards Efficient MUS Extraction," AI Communications, vol. 25, no. 2, pp. 97-116, 2012.
25. L. Cordeiro, B. Fischer, and J. Marques-Silva, "SMT-Based Bounded Model Checking for Embedded ANSI-C Software," IEEE Transactions on Software Engineering, vol. 38, no. 4, pp. 957-974, 2012.
26. J. Marques-Silva, "Computing Minimally Unsatisfiable Subformulas: State of the Art and Future Directions," Journal of Multiple-Valued Logic and Soft Computing, vol. 19, no. 2-3, pp. 163-183, 2012.
27. M. Janota, I. Lynce, V. Manquinho and J. Marques-Silva, "PackUp: Tools for Package Upgradability Solving, System Description," Journal on Satisfiability, Boolean Modeling and Computation, vol. 8, pp. 89-94, 2012.
28. H. Chen and J. Marques-Silva, "TG-Pro: A SAT-based ATPG System, System Description," Journal on Satisfiability, Boolean Modeling and Computation, vol. 8, pp. 83-88, 2012.
29. J. Marques-Silva, J. Argelich, A. Graça, and I. Lynce, "Boolean Lexicographic Optimization: Algorithms & Applications," Annals of Mathematics and Artificial Intelligence, vol. 62, no. 3-4, pp. 317-343, 2011.
30. I. Lynce and J. Marques-Silva, "Restoring CSP Satisfiability with MaxSAT," Fundamenta Informaticae, vol. 107, no. 2-3, pp. 249-266, 2011.
31. K. Sakallah and J. Marques-Silva, "Anatomy and Empirical Evaluation of Modern SAT Solvers," Bulletin of the EATCS, vol. 103, pp. 96-121, Feb. 2011.

CORE Ranking	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	#/year
A*	2	4	2	2	4	3	2	6	4	4	33	3.3
A	9	6	7	4	1	4	4	3	1	1	40	4.0

Table 1: Top conference & journal publications – 10 year track record, between 2014-2023 (and until 03/2023), The CORE ranking is selected for the year of publication.

32. A. Graça, J. Marques-Silva, I. Lynce and A. Oliveira, "Haplotype Inference with Pseudo-Boolean Optimization," Annals of Operations Research, vol. 184, no. 1, pp.137-162, 2011.
33. A. Morgado and J. Marques-Silva, "Combinatorial Optimization Solutions for the Maximum Quartet Consistency Problem," Fundamenta Informaticae, vol. 102, no. 3-4, pp. 363-389, 2010.
34. Y. Chen, S. Safarpour, J. Marques-Silva and A. Veneris, "Automated Design Debugging with Maximum Satisfiability," IEEE Transactions on Computer-Aided Design, vol. 29, no. 11, pp. 1804-1817, 2010.
35. A. Graça, I. Lynce, J. Marques-Silva and A. Oliveira, "Haplotype Inference by Pure Parsimony: a Survey," Journal of Computational Biology, vol. 71, no. 8, pp. 969-992, 2010.
36. M. Liffiton, M. Mneimneh, I. Lynce, Z. Andraus, J. Marques-Silva and K. Sakallah, "A Branch and Bound Algorithm for Extracting Smallest Minimal Unsatisfiable Subformulas", Constraints: An International Journal, vol. 14, no. 4, pp. 415-442, 2009.
37. J. Marques-Silva, "Model Checking with Boolean Satisfiability," Journal of Algorithms in Cognition, Informatics and Logic, vol. 63, no. 1-3, pp. 3-16, 2008.
38. I. Lynce, J. Marques-Silva, and S. Prestwich, "Boosting Haplotype Inference with Local Search," Constraints: An International Journal, vol. 13, no. 1-2, pp. 155-179, 2008.
39. I. Lynce and J. Marques-Silva, "Haplotype Inference with Boolean Satisfiability," International Journal on Artificial Intelligence Tools, vol. 17, no. 2, pp. 355-387, 2008.
40. I. Lynce and J. Marques-Silva, "Random Backtracking in Backtrack Search Algorithms for Satisfiability," Discrete Applied Mathematics, vol. 155, no. 12, pp. 1604-1612, June 2007.
41. J. Marques-Silva, "Interpolant Learning and Reuse in SAT-Based Model Checking," Electronic Notes on Theoretical Computer Science, vol. 174, no. 3, pp. 31-43, May 2007.

Conference Papers (Refereed, Proceedings with ISBN, Since 2007)

1. R. Mencia, C. Mencia, and J. Marques-Silva. "Efficient Reasoning about Infeasible One Machine Sequencing". In: ICAPS. In Press. July 2023.
2. X. Huang, M. C. Cooper, A. Morgado, J. Planes, and J. Marques- Silva. "Feature Necessity & Relevancy in ML Classifier Explanations". In: TACAS. In Press. Apr. 2023.
3. X. Huang, Y. Izza, and J. Marques-Silva. "Solving Explainability Queries with Quantification: The Case of Feature Relevancy". In: AAAI. In Press. Feb. 2023.
4. J. Yu, A. Ignatiev, P. J. Stuckey, N. Narodytska, and J. Marques-Silva. "Eliminating The Impossible, Whatever Remains Must Be True: On Extracting and Applying Background Knowledge In The Context Of Formal Explanations". In: AAAI. Feb. 2023.
5. J. Marques-Silva and A. Ignatiev. "Delivering Trustworthy AI through Formal XAI". In: AAAI. Feb 2022, pp. 12342-12350.
6. A. Ignatiev, Y. Izza, P. J. Stuckey, and J. Marques-Silva. "Using MaxSAT for Efficient Explanations of Tree Ensembles". In: AAAI. Feb 2022, pp. 3776-3785.
7. X. Huang, Y. Izza, A. Ignatiev, M. C. Cooper, N. Asher, and J. Marques-Silva. "Tractable Explanations for d-DNNF Classifiers". In: AAAI. Feb. 2022. AAAI Press, Feb. 2022, pp. 5719-5728.
8. A. Shrotri, N. Narodytska, A. Ignatiev, K. S. Meel, J. Marques- Silva, and Moshe Y. Vardi. "Constraint-Driven Explanations for Black-Box ML Models". In: AAAI. Feb. 2022, pp. 8304-8314.
9. G. Cabodi, P. E. Camurati, A. Ignatiev, J. Marques-Silva, M. Palena, and P. Pasini. "Optimizing Binary Decision Diagrams for Interpretable Machine Learning Classification". In: DATE. Feb. 2021. pp. 1122-1125.
10. M. C. Cooper and J. Marques-Silva. "On the Tractability of Explaining Decisions of Classifiers". In: CP. Oct. 2021. p. 21:1-21:18.
11. X. Huang, Y. Izza, A. Ignatiev, and J. Marques-Silva. "On Efficiently Explaining Graph-Based Classifiers". In: KR. Nov. 2021. pp. 356-367.
12. A. Ignatiev, E. Lam, P. J. Stuckey, and J. Marques-Silva. "A Scalable Two Stage Approach to Computing Optimal Decision Sets". In: AAAI. Feb. 2021. pp. 3806-3814.

13. Y. Izza and J. Marques-Silva. “On Explaining Random Forests with SAT”. In: IJCAI. Aug 2021. pp. 2584-2591.
14. A. Ignatiev, J. Marques-Silva, N. Narodytska, and P. J. Stuckey. “Reasoning- Based Learning of Interpretable ML Models”. In: IJCAI. Aug. 2021. pp. 4458-4465.
15. A. Ignatiev and J. Marques-Silva. “SAT-Based Rigorous Explanations for Decision Lists”. In: SAT. Jul. 2021. pp. 251-269.
16. S. Kochemazov, A. Ignatiev, and J. Marques-Silva. “Assessing Progress in SAT Solvers Through the Lens of Incremental SAT”. In: SAT. Jul 2021. pp. 280-298.
17. J. Marques-Silva, T. Gerspacher, M. C. Cooper, A. Ignatiev, and N. Narodytska. “Explanations for Monotonic Classifiers”. In: ICML. Jul. 2021. pp. 7469-7479.
18. A. Ignatiev, M. C. Cooper, M. Siala, E. Hebrard, and J. Marques-Silva. “Towards Formal Fairness in Machine Learning”. In: CP. Sep. 2021. pp. 846-867.
19. J. Marques-Silva, T. Gerspacher, M. C. Cooper, A. Ignatiev, and N. Narodytska. “Explaining Naive Bayes and Other Linear Classifiers with Polynomial Time and Delay”. In: NeurIPS. Dec. 2020.
20. A. Ignatiev, N. Narodytska, N. Asher, and J. Marques-Silva. “From Contrastive to Abductive Explanations and Back Again”. In: AIxIA. Nov. 2020. pp. 335-355.
21. J. Marques-Silva and C. Mencia. “Reasoning About Inconsistent Formulas”. In: IJCAI. Jul 2020. pp. 4899-4906.
22. C. Mencia and J. Marques-Silva. “Reasoning About Strong Inconsistency in ASP”. In: SAT. pp. 332-342.
23. O. Zaikin, A. Ignatiev, and J. Marques-Silva. “Branch Location Problems with Maximum Satisfiability”. In: ECAI. Aug 2020. pp. 379-386.
24. A. Ignatiev, A. Morgado, G. Weissenbacher, and J. Marques-Silva. “Model-Based Diagnosis with Multiple Observations”. In: IJCAI. Aug. 2019. pp. 1108-1115.
25. A. Ignatiev, N. Narodytska, and J. Marques-Silva. “Abduction-Based Explanations for Machine Learning Models”. In: AAAI. Jan. 2019. pp. 1511-1519.
26. A. Ignatiev, N. Narodytska, and J. Marques-Silva. “On Relating Explanations and Adversarial Examples”. In: NeurIPS. Dec. 2019. pp. 15857-15867.
27. C. Mencia and J. Marques-Silva. “Computing Shortest Resolution Proofs”. In: EPIA. Sep. 2019. pp. 539-551.
28. C. Mencia, O. Kullmann, A. Ignatiev, and J. Marques-Silva. “On Computing the Union of MUSes”. In: SAT. Jul 2019. pp. 211-221.
29. A. Morgado, A. Ignatiev, M. L. Bonet, J.o Marques-Silva, and S. Buss. “DRMaxSAT with MaxHS: First Contact”. In: SAT. Jul. 2019. pp. 239-249.
30. N. Narodytska, A. A. Shrotri, K. S. Meel, A. Ignatiev, and J. Marques-Silva. “Assessing Heuristic Machine Learning Explanations with Model Counting”. In: SAT. Jul. 2019. pp. 267-278.
31. I. Zakirzyanov, A. Morgado, A. Ignatiev, V. Ulyantsev and J. Marques-Silva, “Efficient Symmetry Breaking for SAT-based Minimum DFA Inference,” International Conference on Language and Automata Theory and Applications (LATA), March 2019.
32. A. Ignatiev, N. Narodytska and J. Marques-Silva, “Abduction-Based Explanations for Machine Learning Models,” AAAI Conference on Artificial Intelligence (AAAI), January 2019.
33. N. Narodytska, A. Ignatiev, F. Pereira and J. Marques-Silva, “Learning Optimal Decision Trees with SAT,” International Joint Conference on Artificial Intelligence (IJCAI), July 2018.
34. J. Marques-Silva, “Computing with SAT Oracles: Past, Present & Future,” Computability in Europe (CiE), Invited Paper, July 2018.
35. A. Ignatiev, F. Pereira, N. Narodytska and J. Marques-Silva, “A SAT-Based Approach to Learn Explainable Decision Sets,” International Joint Conference on Automated Reasoning (IJCAR), July 2018.
36. A. Ignatiev, A. Morgado and J. Marques-Silva, “PySAT: A Python Toolkit for Prototyping with SAT Oracles,” International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2018.
37. M. L. Bonet, S. Buss, A. Ignatiev, A. Morgado, J. Marques-Silva, “MaxSAT Resolution with the Dual Rail Encoding,” AAAI Conference on Artificial Intelligence (AAAI), February 2018.
38. A. Previti, C. Mencia, M. Jarvisalo, J. Marques-Silva, “Premise Set Caching for Enumerating Minimal Correction Subsets,” AAAI Conference on Artificial Intelligence (AAAI), February 2018.
39. A. Previti, A. Ignatiev, M. Jarvisalo, J. Marques-Silva, “On Computing Generalized Backbones,” International Conference on Tools with Artificial Intelligence (ICTAI), November 2017.
40. A. Ignatiev, A. Morgado, J. Marques-Silva, “On Tackling the Limits of Resolution in SAT Solving,” International Conference on Theory and Applications of Satisfiability Testing (SAT), August 2017.
41. A. Previti, C. Mencia, M. Jarvisalo, J. Marques-Silva, “Improving MCS Enumeration via Caching,” International Conference on Theory and Applications of Satisfiability Testing (SAT), August 2017.

42. J. Marques-Silva, A. Ignatiev, A. Morgado, "Horn Maximum Satisfiability: Reductions, Algorithms & Applications," Portuguese Conference on Artificial Intelligence (EPIA), September 2017.
43. M. Janota, J. Marques-Silva, "On Proving True QBFs with Term-Resolution," Portuguese Conference on Artificial Intelligence (EPIA), September 2017.
44. A. Ignatiev, A. Morgado, J. Marques-Silva, "Cardinality Encodings for Graph Optimization Problems," International Joint Conference on Artificial Intelligence (IJCAI), August 2017.
45. R. Penaloza, C. Mencia, A. Ignatiev, J. Marques-Silva, "Lean Kernels in Description Logics," European Semantic Web Conference (ESWC), May 2017. (Nominated for Best Paper Award.)
46. L. Cruz-Filipe, J. Marques-Silva, P. Schneider-Kamp, "Efficient Certified Resolution Proof Checking," Tools and Algorithms for the Construction and Analysis of Systems (TACAS), April 2017.
47. J. Marques-Silva, A. Ignatiev, C. Mencia, R. Penaloza, "Efficient Reasoning for Inconsistent Horn Formulae," European Conference on Logics in Artificial Intelligence (JELIA), November 2016.
48. A. Ignatiev, A. Previti, J. Marques-Silva, "On Finding Minimum Satisfying Assignments," International Conference on Principles and Practice of Constraint Programming (CP), September 2016.
49. A. Ignatiev, A. Morgado, J. Marques-Silva, "Propositional Abduction with Implicit Hitting Sets," European Conference on Artificial Intelligence (ECAI), August 2016.
50. C. Mencia, A. Ignatiev, A. Previti, J. Marques-Silva, "MCS Extraction with Sublinear Oracle Calls," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2016.
51. M. F. Arif, C. Mencia, A. Ignatiev, N. Manthey, R. Penaloza, J. Marques-Silva, "BEACON: An Efficient SAT-Based Tool for Debugging $\mathcal{EL}^+$ Ontologies," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2016.
52. T. Saber, A. Ventresque, J. Marques-Silva, J. Thorburn, L. Murphy, "MILP for the Multi-objective VM Reassignment Problem," International Conference on Tools with Artificial Intelligence (ICTAI), November 2015.
53. M. F. Arif, C. Mencia, J. Marques-Silva, "Efficient MUS Enumeration of Horn Formulae with Applications to Axiom Pinpointing," International Conference on Theory and Applications of Satisfiability Testing (SAT), September 2015.
54. A. Ignatiev, A. Previti, J. Marques-Silva, "SAT-Based Formula Simplification," International Conference on Theory and Applications of Satisfiability Testing (SAT), September 2015.
55. C. Mencia, A. Previti, J. Marques-Silva, "SAT-Based Horn Least Upper Bounds," International Conference on Theory and Applications of Satisfiability Testing (SAT), September 2015.
56. O. Kullmann, J. Marques-Silva, "Computing Maximal Autarkies with Few and Simple Oracle Queries," International Conference on Theory and Applications of Satisfiability Testing (SAT), September 2015.
57. M. F. Arif, C. Mencia, J. Marques-Silva, "Efficient Axiom Pinpointing with EL2MCS," German Conference on Artificial Intelligence (KI), September 2015.
58. A. Ignatiev, A. Previti, M. Liffiton, J. Marques-Silva, "Smallest MUS Extraction with Minimal Hitting Set Dualization," International Conference on Principles and Practice of Constraint Programming (CP), September 2015.
59. J. Marques-Silva, M. Janota, A. Ignatiev, A. Morgado, "Efficient Model Based Diagnosis with Maximum Satisfiability," International Joint Conference on Artificial Intelligence (IJCAI), July 2015.
60. C. Mencia, A. Previti, J. Marques-Silva, "Literal-Based MCS Extraction," International Joint Conference on Artificial Intelligence (IJCAI), July 2015.
61. A. Previti, A. Ignatiev, A. Morgado, J. Marques-Silva, "Prime Compilation of Non-Clausal Formulae," International Joint Conference on Artificial Intelligence (IJCAI), July 2015.
62. M. Janota, J. Marques-Silva, "Solving QBF by Clause Selection," International Joint Conference on Artificial Intelligence (IJCAI), July 2015.
63. C. Mencia, J. Marques-Silva, "Efficient Relaxations of Over-Constrained CSPs," International Conference on Tools with Artificial Intelligence (ICTAI), November 2014.
64. S. Jabbour, J. Marques-Silva, L. Sais and Y. Salhi, "Enumerating Prime Implicants of Propositional Formulae in Conjunctive Normal Form," European Conference on Logics in Artificial Intelligence (JELIA), September 2014.
65. A. Morgado, C. Dodaro, J. Marques-Silva, "Core-Guided MaxSAT with Soft Cardinality Constraints," International Conference on Principles and Practice of Constraint Programming (CP), September 2014.
66. J. Marques-Silva, A. Ignatiev, A. Morgado, V. Manquinho, I. Lynce, "Efficient Autarkies," European Conference on Artificial Intelligence (ECAI), August 2014.
67. A. Ignatiev, A. Morgado, V. Manquinho, I. Lynce, J. Marques-Silva, "Progression in Maximum Satisfiability," European Conference on Artificial Intelligence (ECAI), August 2014.
68. Y. Malitsky, B. O'Sullivan, A. Previti, J. Marques-Silva, "Timeout-Sensitive Portfolio Approach to Enumerating Minimal Correction Subsets for Satisfiability Problems," European Conference on Artificial Intelligence (ECAI),

August 2014.

69. J. Marques-Silva and A. Previti, "On Computing Preferred MUSes and MCSes," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2014.
70. A. Ignatiev, A. Morgado, J. Marques-Silva, "On Reducing Maximum Independent Set to Minimum Satisfiability," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2014.
71. A. Belov, M. Heule, J. Marques-Silva, "MUS Extraction using Clausal Proofs," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2014.
72. A. Ignatiev, M. Janota, J. Marques-Silva, "Towards Efficient Optimization in Package Management Systems," International Conference on Software Engineering (ICSE), May 2014.
73. Y. Malitsky, B. O'Sullivan, A. Previti, J. Marques-Silva, "A Portfolio Approach to Enumerating Minimal Correction Subsets for Satisfiability Problems," Conference on Integration of Artificial Intelligence and Operations Research (CPAIOR), May 2014.
74. A. Gurfinkel, A. Belov, J. Marques-Silva, "Synthesizing Safe Bit-Precise Invariants," Tools and Algorithms for the Construction and Analysis of Systems (TACAS), April 2014.
75. M. Janota, G. Botterweck, J. Marques-Silva, "On Lazy and Eager Interactive Reconfiguration," Workshop on Variability Modelling of Software-intensive Systems (VaMoS), January 2014.
76. M. Janota, R. Grigore, J. Marques-Silva, "On QBF Proofs and Preprocessing," International Conference on Logic for Programming, Artificial Intelligence and Reasoning (LPAR), December 2013.
77. A. Ignatiev, A. Morgado, J. Planes, J. Marques-Silva, "Maximal Falsifiability: Definitions, Algorithms, and Applications," International Conference on Logic for Programming, Artificial Intelligence and Reasoning (LPAR), December 2013.
78. A. Belov, A. Morgado, J. Marques-Silva, "SAT Preprocessing for MaxSAT," International Conference on Logic for Programming, Artificial Intelligence and Reasoning (LPAR), December 2013.
79. A. Morgado, F. Heras, J. Marques-Silva, "Model-Guided Approaches for MaxSAT Solving," International Conference on Tools with Artificial Intelligence (ICTAI), November 2013.
80. W. Klieber, M. Janota, J. Marques-Silva, and E. Clarke, "Solving QBF with Free Variables," International Conference on Principles and Practice of Constraint Programming (CP), September 2013.
81. J. Marques-Silva, F. Heras, M. Janota, A. Previti, A. Belov, "On Computing Minimal Correction Subsets," International Joint Conference on Artificial Intelligence (IJCAI), August 2013.
82. A. Previti, J. Marques-Silva, "Partial MUS Enumeration," AAAI Conference on Artificial Intelligence (AAAI), July 2013.
83. J. Marques-Silva, M. Janota, A. Belov, "Minimal Sets over Monotone Predicates in Boolean Formulae," Computer-Aided Verification (CAV), July 2013.
84. A. Belov, N. Manthey, J. Marques-Silva, "Parallel MUS Extraction," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2013.
85. A. Ignatiev, M. Janota, J. Marques-Silva, "Quantified Maximum Satisfiability: A Core-Guided Approach," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2013.
86. M. Janota, J. Marques-Silva, "On Propositional QBF Expansions and Q-Resolution," International Conference on Theory and Applications of Satisfiability Testing (SAT), July 2013.
87. A. Belov, M. Jarvisalo, J. Marques-Silva, "Formula Preprocessing in MUS Extraction," Tools and Algorithms for the Construction and Analysis of Systems (TACAS), March 2013.
88. A. Belov, H. Chen, A. Mishchenko, J. Marques-Silva, "Core Minimization in SAT-based Abstraction," Design, Automation and Test in Europe Conference and Exhibition (DATE), March 2013.
89. A. Morgado, M. Liffiton, J. Marques-Silva, "MaxSAT-Based MCS Enumeration," Haifa Verification Conference (HVC), November 2012.
90. F. Heras, A. Morgado, J. Planes, J. Marques-Silva, "Iterative SAT Solving for Minimum Satisfiability," International Conference on Tools with Artificial Intelligence (ICTAI), November 2012.
91. A. Belov, M. Janota, I. Lynce, and J. Marques-Silva, "On Computing Minimal Equivalent Subformulas," International Conference on Principles and Practice of Constraint Programming (CP), September 2012.
92. A. Belov, A. Ivrii, A. Matsliah, and J. Marques-Silva, "On Efficient Computation of Variable MUSes," International Conference on Theory and Applications of Satisfiability Testing (SAT), June 2012.
93. M. Janota, W. Klieber, J. Marques-Silva, and E. Clarke, "Solving QBF with Counterexample Guided Refinement," International Conference on Theory and Applications of Satisfiability Testing (SAT), June 2012.
94. A. Morgado, F. Heras, and J. Marques-Silva, "Improvements to Core-Guided Binary Search for MaxSAT," International Conference on Theory and Applications of Satisfiability Testing (SAT), June 2012.

95. L. Bordeaux, M. Janota, J. Marques-Silva, P. Marquis, "On Unit-Refutation Complete Formulae with Existentially Quantified Variables," Knowledge Representation (KR), Rome, Italy, June 2012.
96. F. Heras, A. Morgado, and J. Marques-Silva, "An Empirical Study of Encodings for Group MaxSAT," Canadian Conference on Artificial Intelligence (AI), May 2012.
97. H. Chen, J. Marques-Silva, "New and Improved Models for SAT-Based Bi-Decomposition," Great Lakes Symposium on VLSI (GLS VLSI), May 2012.
98. H. Chen, M. Janota, and J. Marques-Silva, "QBF-Based Boolean Function Bi-Decomposition," Design, Automation and Test in Europe Conference and Exhibition (DATE), Dresden, Germany, March 2012.
99. L. Bordeaux and J. Marques-Silva, "Knowledge Compilation with Empowerment," International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM), Spindleruv Mlyn, Czech Republic, January 2012.
100. F. Heras, A. Morgado, and J. Marques-Silva, Lower Bounds and Upper Bounds for MaxSAT," Learning and Intelligent OptimizatioN Conference (LION), Paris, France, January 2012.
101. A. Morgado, J. Marques-Silva, "On Validating Boolean Optimizers," International Conference on Tools with Artificial Intelligence (ICTAI), Boca Raton, Florida, USA, November 2011. (Runner-Up for Best Poster Award.)
102. A. Belov, J. Marques-Silva, "Accelerating MUS Extraction with Recursive Model Rotation," Formal Methods in Computer-Aided Design (FMCAD), Austin, Texas, USA, October 2011.
103. H. Chen and J. Marques-Silva, "Improvements to Satisfiability-Based Boolean Function Bi-Decomposition," IFIP/IEEE International Conference on Very Large Scale Integration (VLSI-SoC), Hong-Kong, China, October 2011. (Runner-Up for Best Paper Award.)
104. M. Janota and J. Marques-Silva, "On Deciding MUS Membership with QBF," International Conference on Principles and Practice of Constraint Programming (CP), Perugia, Italy, September 2011.
105. F. Heras, A. Morgado and J. Marques-Silva, "Core-Guided Binary Search Algorithms for Maximum Satisfiability," AAAI Conference on Artificial Intelligence (AAAI), San Francisco, CA, USA, August 2011.
106. F. Heras and J. Marques-Silva, "Read-Once Resolution for Unsatisfiability-Based Max-SAT Algorithms," International Joint Conference on Artificial Intelligence (IJCAI), Barcelona, Spain, July 2011.
107. J. Marques-Silva and I. Lynce, "On Improving MUS Extraction Algorithms," International Conference on Theory and Applications of Satisfiability Testing (SAT), Ann Arbor, MI, USA, June 2011.
108. M. Janota and J. Marques-Silva, "Abstraction-Based Algorithm for 2QBF," International Conference on Theory and Applications of Satisfiability Testing (SAT), Ann Arbor, MI, USA, June 2011.
109. A. Belov and J. Marques-Silva, "Minimally Unsatisfiable Boolean Circuits," International Conference on Theory and Applications of Satisfiability Testing (SAT), Ann Arbor, MI, USA, June 2011.
110. H. Katebi, K. Sakallah and J. Marques-Silva, "Empirical Study of the Anatomy of Modern SAT Solvers," International Conference on Theory and Applications of Satisfiability Testing (SAT), Ann Arbor, MI, USA, June 2011.
111. M. Janota and J. Marques-Silva, "cmMUS: A Tool for Circumscription-Based MUS Membership Testing," International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR), Vancouver, Canada, May 2011.
112. M. Janota, R. Grigore and J. Marques-Silva, "Counterexample Guided Abstraction Refinement Algorithm for Propositional Circumscription," European Conference on Logics in Artificial Intelligence (JELIA), Helsinki, Finland, September 2010.
113. A. Darbari, B. Fischer and J. Marques-Silva, "Industrial-Strength Certified SAT Solving through Verified SAT Proof Checking," International Colloquium on Theoretical Aspects of Computing (ICTAC), Natal, Brazil, September 2010.
114. J. Marques-Silva, M. Janota and I. Lynce, "On Computing Backbones of Propositional Theories," European Conference on Artificial Intelligence (ECAI), Lisbon, Portugal, August 2010.
115. A. Graça, I. Lynce, J. Marques-Silva and A. Oliveira, "Efficient and Accurate Haplotype Inference by Combining Parsimony and Pedigree Information,"Algebraic and Numeric Biology (ANB), Linz, Austria, July/August 2010.
116. J. Marques-Silva, "Minimal Unsatisfiability: Models, Algorithms & Applications," International Symposium on Multiple-Valued Logic (ISMVL), Barcelona, Spain, May 2010.
117. L. Cordeiro, B. Fischer and J. Marques-Silva, "Continuous Verification of Large Embedded Software using SMT-Based Bounded Model Checking," International Conference Engineering of Computer-Based Systems (ECBS), Oxford, United Kingdom, March 2010.
118. M. Janota, G. Botterweck, R. Grigore and J. Marques-Silva, "How and When to End an Interactive Configuration Process?," International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM), Spindleruv Mlyn, Czech Republic, January 2010.
119. P. Matos, B. Fischer and J. Marques-Silva, "A Lazy Unbounded Model Checker for Event-B," International Conference on Formal Engineering Methods (ICFEM), Rio de Janeiro, Brazil, December 2009.

120. H. Chen and J. Marques-Silva, "TG-PRO: A New Model for SAT-Based ATPG," International High Level Design Validation and Test Workshop, San Francisco (HLDVT), CA, USA, November 2009.
121. L. Cordeiro, B. Fischer, and J. Marques-Silva, "SMT-Based Bounded Model Checking for Embedded ANSI-C Software," International Conference on Automated Software Engineering (ASE), Auckland, New Zealand, November 2009.
122. I. Lynce and J. Marques-Silva, "Restoring CSP Satisfiability with MaxSAT," Portuguese Conference on Artificial Intelligence (EPIA), Aveiro, Portugal, October 2009.
123. J. Argelich, I. Lynce and J. Marques-Silva, "On Solving Boolean Multilevel Optimization Problems," International Joint Conference on Artificial Intelligence (IJCAI), Pasadena, CA, USA, July 2009.
124. V. Manquinho, J. Marques-Silva and J. Planes, "Algorithms for Weighted Boolean Optimization," International Conference on Theory and Applications of Satisfiability Testing (SAT), Swansea, UK, July 2009.
125. Y. Chen, S. Safarpour, A. Veneris and J. Marques-Silva, "Spatial and Temporal Design Debug using Partial MaxSAT", Great Lakes Symposium on VLSI (GLS-VLSI), Boston, MA, USA, May 2009.
126. L. Cordeiro, B. Fischer, H. Chen and J. Marques-Silva, "Semiformal Verification of Embedded Software in Medical Devices Considering Stringent Hardware Constraints," International Conference on Embedded Software and Systems (ICESS), HangZhou, China, May 2009.
127. J. Marques-Silva, I. Lynce and V. Manquinho, "Symmetry Breaking for Maximum Satisfiability," International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR), Doha, Qatar, November 2008.
128. I. Lynce, A. Graça, J. Marques-Silva and A. Oliveira, "Haplotype Inference with Boolean Constraint Solving: An Overview," International Conference on Tools with Artificial Intelligence (ICTAI), Dayton, Ohio, USA, November 2008.
129. P. Matos and J. Marques-Silva, "Model Checking Event-B by Encoding into Alloy," ABZ2008 Conference (ABZ), London, UK, September 2008.
130. P. Matos J. Planes, F. Letombe and J. Marques-Silva, "An Algorithm Porfolio for MAX-SAT," European Conference on Artificial Intelligence (ECAI), Patras, Greece, July 2008.
131. J. Marques-Silva, "Practical Applications of Boolean Satisfiability," Workshop on Discrete Event Systems (WODES), Göteborg, Sweden, May 2008.
132. A. Graça, J. Marques-Silva, I. Lynce, and A. Oliveira, "Efficient Haplotype Inference with Combined CP and OR Techniques," International Conference on Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (CPAIOR), Paris, France, May 2008.
133. F. Heras, V. Manquinho, and J. Marques-Silva, "On Applying Unit Propagation-Based Lower Bounds in Pseudo-Boolean Optimization," International FLAIRS Conference (FLAIRS), Florida, USA, May 2008.
134. F. Letombe, and J. Marques-Silva, "Improvements to Hybrid Incremental SAT Algorithms," International Conference on Theory and Applications of Satisfiability Testing (SAT), Guangzhou, China, May 2008.
135. J. Marques-Silva, and V. Manquinho, "Towards More Effective Unsatisfiability-Based Maximum Satisfiability Algorithms," International Conference on Theory and Applications of Satisfiability Testing (SAT), Guangzhou, China, May 2008.
136. J. Marques-Silva, and J. Planes, "Algorithms for Maximum Satisfiability using Unsatisfiable Cores," Design, Automation and Test in Europe Conference and Exhibition (DATE), Munich, Germany, March 2008.

Keynote Talks, Invited Talks & Tutorials (Since 2014)

Jul 2023, "Formal Explainability in Artificial Intelligence," Course to be taught at First European Summer School on Artificial Intelligence (ESSAI) / Twentieth Advanced Course on Artificial Intelligence (ACAI), Ljubljana, Slovenia.

Sep 2022, "Abductive Explanations in ML," Invited Short Course, Reasoning Web @ Declarative AI 2022, Berlin, Germany.

Sep 2022, "Formal Explainability in AI," Invited Talk, DX Workshop, Toulouse, France.

Oct 2021, "Formal Reasoning Methods in Explainable Artificial Intelligence," Invited Talk, Workshop on Formalisation des Activites Concurrentes (FAC), Toulouse France.

Oct 2021, "Automated Reasoning in Explainable Artificial Intelligence," Invited Talk, Catalan Conference on Artificial Intelligence (CCIA), Catalunya.

Oct 2021, "Logic-Enabled Explainability in Machine Learning," Invited Talk, University of Edinburgh, United Kingdom.

Sep 2021, "Automated Reasoning for XAI," Invited Talk, TAILOR EU Project Workshop.

Jul 2021, "Logic-Enabled Explainability in Machine Learning," Invited Talk, Master Class on XAI, International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR), Vienna, Austria.

Jan 2021, "Rigorous Verification and Explanation of Models," Tutorial, International Joint Conference on Artificial Intelligence (IJCAI), Yokohama, Japan (With K. Meel, A. Ignatiev and N. Narodytska) [Online]

Nov 2020, "Machine Learning Meets Automated Reasoning: Explainability, Fairness, Robustness and Model Learning," Invited Lecture, International Autumn School on Constraint Programming, Combinatorial Optimization and Machine Learning, Toulouse, France. [Online]

Sep 2020, "Automated Reasoning for Machine Learning," Keynote Talk, International Conference on Logic Programming (ICLP), Rende, Italy. [Online]

Feb 2020, "Rigorous Verification and Explanation of Models," Tutorial, AAAI Conference on Artificial Intelligence (AAAI), New York, U.S.A. (With K. Meel, A. Ignatiev and N. Narodytska)

Feb 2020, "Computing with SAT Oracles," Invited Talk, Dagstuhl Seminar SAT and Interactions, Schloss Dagstuhl, Germany.

Sep 2019, "On Applying SAT Beyond SAT," Invited Talk, Dagstuhl Seminar Deduction Beyond Satisfiability, Schloss Dagstuhl, Germany.

Jul 2019, "Problem Solving with SAT Oracles," Invited Lecture, 8^{th} SAT/SMT Summer School, Lisbon, Portugal.

Apr 2019, "Towards Logic-Based eXplainable AI," Invited Talk, Conference on Artificial Intelligence and Theorem Proving (AITP 2019), Obergurgl, Austria.

Jan 2019, "Computing with SAT Oracles – From CDCL SAT Solving to Ubuiquitous Industry Adoption," Invited Tutorial, International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2019) Winter School, Lisbon, Portugal.

Oct 2018, "On Solving Enumeration Problems with SAT Oracles," Invited Talk, Dagstuhl Seminar Algorithmic Enumeration: Output-sensitive, Input-sensitive, Parameterized, Approximative, Schloss Dagstuhl, Germany.

Aug 2018, "MaxSAT-Based Proof Systems," Invited Talk, Workshop on Theory and Practice of Satisfiability Solving, Casa Matematica Oaxaca (CMO), Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Oaxaca, Mexico.

Jul 2018, "Computing with SAT Oracles – Past, Present & Future," Invited Talk, Computability in Europe (CiE) 2018, Session on SAT Solving, Kiel, Germany.

Apr 2018, "A Computational Logic Approach for Finding Maximum-Size Cliques in Large-Scale Networks," Invited Talk, Mathematical Logic Seminars, Faculty of Science, University of Lisbon, Lisbon, Portugal.

Nov 2017, "Emerging Trends in Machine Learning & Data Mining," Invited Talk, Symposium on Big Data in Finance, Retail & Commerce, Lisbon, Portugal.

Sep 2017, "SAT by MaxSAT: From NP to Beyond NP and Back Again," Invited Talk, Dagstuhl Seminar Recent Trends in Knowledge Compilation, Schloss Dagstuhl, Germany.

May 2017, "Computing with Oracles: From NP to Beyond NP and Back Again," Invited Talk, Workshop on Bridging TCS & AI, Paris France.

Dec 2016, "Modern CDCL SAT Solvers," Invited Tutorial, SAT/SMT School, Mumbai, India.

Aug 2016, "CDCL SAT Solving: Past, Present & Future," Invited Talk, Theoretical Foundations of SAT Solving Workshop, Fields Institute for Research in Mathematical Sciences, Toronto, Canada.

Jul 2016, "Efficient Problem Solving with SAT Engines," Invited Talk, Industry Day @ SAT 2016, Bordeaux, France.

Jun 2016, "Introduction to Boolean Satisfiability," Invited Lecture, 6^{th} SAT/SMT Summer School, Lisbon, Portugal.

Jun 2016, "Problem Solving with SAT Oracles," Invited Talk, Workshop on Logical and Semantic Frameworks, with Applications, Porto, Portugal.

Dec 2015, "Problem Solving with Constraints: Past, Present & Future," Department of Informatics Seminar Series, Faculty of Science, University of Lisbon, Portugal.

Jun 2015, "Prime Compilation of Non-Clausal Formulae," Symposium on New Frontiers in Knowledge Compilation, Vienna Center for Logic and Algorithms, Austria.

Apr 2015, "MaxSAT Solving with SAT Oracles," Dagstuhl Seminar on Theory and Practice of SAT Solving, Schloss Dagstuhl, Germany.

Apr 2015, "Conflict-Driven Clause Learning SAT Solvers," Dagstuhl Seminar on Theory and Practice of SAT Solving, Schloss Dagstuhl, Germany.

Feb 2015, "SAT-Based Problem Solving," Graduate Seminar, University of Calabria, Cosenza, Italy.

Sep 2014, "Solving Function Problems with SAT Oracles," Invited Talk, CP 2014 Workshop on Bridging the Gap Between Theory and Practice in Constraint Solvers, Lyon, France.

Jan 2014, "Problem Solving with SAT Oracles," Invited Talk, Workshop on Theoretical Foundations of Applied SAT Solving, Banff International Research Station, Banff, Canada.

Research Grants (Since 2005)

IRIT, CNRS & ANITI

Sep 2019-Aug 2023. Research Chair (in total 24 Chairs) of the AI Interdisciplinary Institute ANITI (Artificial and Natural Intelligence Toulouse Institute), funded by the French program "Investing for the Future - PIA3" under Grant agreement no ANR-19-PI3A-0004. Amount of funding: $>$ 100 MEuro (in total).

2021-2025. ANITI Senior Researcher for the DesCartes CNRS@CREATE Project. Amount of funding: $\sim$30 MEuro (in total).

Oct 2023-Sep 2026. ANITI Senior Researcher for the TUPLES EU Project. Amount of funding: 940 KEuro for ANITI, out of a total of 3.8 MEuro.

Oct 2020-Sep 2023. ANITI Senior Researcher in the COALA EU Project. Amount of funding: 470 KEuro for ANITI, out of a total of 5.7 MEuro

2023-2026, ANITI Senior Researcher in the CORAM industrial collaboration project. Amount of funding: 1.5 MEuro.

2022-2024, ANITI Senior Researcher in the Confiance.AI industrial collaboration project. Amount of funding: 120 KEuro.

Faculty of Science, University of Lisbon

Jul 2018-Jun 2021. Principal Investigator, project 28986 02/SAICT/2017, "ABSOLV: ABstraction for large Scale prOblem soLVing". Project funded by FCT (Portuguese Science & Technology Foundation). Amount of funding: 239.69 KEuro.

Sep 2018-Aug 2021. Team member of project 29300 02/SAICT/2017, "FaultLocker: Tools for Fault Localization and Repair in Critical Software". Project funded by FCT. Amount of funding: 239.25 KEuro.

Jan 2016-Jan 2018. Principal Investigator, United Technologies Research Centre (UTRC) grant, "SAT-Based Techniques for Automated Graph Construction". Total funding: 130 KEuro.

University College Dublin

Jan 2015-Dec 2020. Co-PI, SFI Research Centre, 13/RC/2094, "LERO - the Irish Software Research Centre". Total funding: 38.5 MEuro. Funding for PI: 1.13 MEuro. (Participation in LERO ended in 2016, after resignation from UCD.)

Apr 2010-Sep 2015. Principal Investigator, SFI PI Grant 09/IN.1/I2618, "BEACON: BoolEAn-based deCision and OptimizatioN procedures". Amount of funding: 865 KEuro.

University College Dublin / University of Southampton

Jan 2008-Jun 2010. Principal Investigator, European Commission project ICT/217069, "COCONUT: A Correct-by-Construction Workbench for Design and Verification of Embedded Systems". Amount of funding: 287 KEuro.

Oct 2006-Sep 2009. Microsoft Research European PhD Scholarship Programme 2006. Amount of funding: 90 KEuro.

University of Southampton

Apr 2007-Sep 2009. Principal Investigator, EPSRC grant EP/E012973/1, "NOTOS – New algOrithm for LTL mOdel checking with Satisfiability". Amount of funding: 312 KEuro.

Jun 2006-Nov 2008. Principal Investigator, European Commission project IST/033709, "VERTIGO: VERification and validaTIon of embedded system desiGn wOrkbench". Amount of funding: 263 KEuro.

INESC-ID, Instituto Superior Tecnico, Technical University of Lisbon

Jan 2012-Aug 2015. Principal Investigator, project PTDC/EIA-CCO/123051/2010, "POLARIS: POLynomial hierARchy algorIthms and applicationS". Project funded by FCT (Portuguese Science & Technology Foundation). Amount of funding: 124 KEuro.

Oct 2010-Mar 2013. Principal Investigator, project CMU-PT/ELE/0009/2009, "ATTEST: AlgoriThms and Tools for reasoning about dEpendable SysTems". Project funded by FCT (Portuguese Science & Technology Foundation). Amount of funding (for Portuguese partners): 168 KEuro.

Sep 2004-Aug 2005. Coordinator of R&D contract with TransEDA Ltd., on algorithms for Boolean Satisfiability-based Model Checking. Amount of funding: 120 KEuro.

Sep 2003-Aug 2004. Coordinator of R&D contract with TNI-Valiosys S.A., on algorithms for Boolean Satisfiability-based Model Checking. Amount of funding: 120 KEuro.

Sep 2002-Aug 2003. Coordinator of R&D contract with TNI-Valiosys S.A., on new algorithms for Boolean Satisfiability. Amount of funding: 80 KEuro.

Mar 2002-Jun 2004. SYMBAD research project, funded by the European Commission under the 5th Framework Programme. Coordinated the participation of INESC-ID. Amount of funding (for INESC-ID): 226 KEuro.

Mar 2001-Sep 2002. Coordinator of R&D contract with Valiosys S.A., on developing circuit-aware algorithms for Boolean Satisfiability. Amount of funding: 60 KEuro.

Nov 2000-Oct 2001. Coordinator of R&D contract with IBM Corp. for developing new algorithms for Boolean Satisfiability. Amount of funding: 20 KEuro.

Mar 1996-Dec 2003. Co-coordinator of R&D contract with Cadence Design Systems, supporting the Cadence European Labs. Amount of funding: 960 KEuro (120 KEuro / year during the 8-year period).

Mar 2005-Dec 2005. Coordinated the SATPot project, on new algorithms for Boolean Satisfiability, extensions and applications. Project funded by FCT (Portuguese Science&Technology Foundation). Amount of funding: 88 KEuro.

Awards & Honours

- Computer Aided Verification (CAV) 2009 Award, for "fundamental contributions to the development of high-performance Boolean satisfiability solvers".
- Fellow of the IEEE, since Jan 2016.
- Excellent Teaching Award, IST, Univ. Lisbon, 2014/2015.
- INESC-ID Best Researcher Award, Oct 2013.
- SFI Stokes Professorship in Computer Science and Informatics, School of Computer Science and Informatics, University College Dublin, Ireland, Sep 2008.
- Fulbright scholarship between 1991 and 1994.

Service to the Scientific Community (Since 2007)

- Area Editor, Encoding and Reformulation, Journal on Satisfiability, Boolean Modeling and Computation (JSAT), Dec 2013-date.
- Editorial Board member, Journal on Satisfiability, Boolean Modeling and Computation (JSAT), Jan 2005-date.
- Conference Chair of the 2007 International Conference on the Theory and Applications of Satisfiability Testing (SAT), Lisbon, Portugal, May 2007.
- Associate Editor of Integration, the VLSI Journal, 2009-2015.
- Member of the Steering Committee of BeyondNP.org, a community website for disseminating and promoting research on solvers that reach beyond NP, 2015-date.
- Member of the Steering Committee of the International Conference on Theory and Applications of Satisfiability Testing, 2007-2012.
- Member of the Informal Advisory Group (IAG) on Knowledge Representation and Reasoning (KRR) for the Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE); Also, one of CLAIRE's key supporters.
- Co-Organizer of the Dagstuhl Seminar "Extending the Synergies Between SAT and Description Logics", May 2020, Dagstuhl, Germany.
- Co-Organizer of the special track "Novel Approaches to Ontological Reasoning", International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE), June 2017, Arras, France.
- Co-Organizer of the 1^{st} Beyond NP Workshop, held in conjunction with the AAAI Conference on Artificial Intelligence (AAAI), January 2016, Phoenix, AZ, USA.
- Co-Organizer of the 10^{th} Workshop on Preferences and Soft Constraints, held in conjunction with the International Conference on Constraint Programming (CP), September 2010, St Andrews, United Kingdom.
- Co-Organizer of the 9^{th} Workshop on Preferences and Soft Constraints, held in conjunction with the International Conference on Constraint Programming (CP), September 2008, Sydney, Australia.
- Senior Program Committee member for the IJCAI 2018, 2017 and 2013 conferences, the AAAI 2012 conference, and the CP 2018 conference.
- Member of the Technical Program Committee of the following conferences and workshops (since 2014): AAAI 2023 (Senior PC), ECAI 2023 (Area Chair), IJCAI 2023, ICML 2023, AAAI 2022 (Senior PC), IJCAI 2022, SIGKDD 2022, ICLR 2022, ICML 2022, UAI 2022 (selected as Top Reviewer), NeurIPS 2022, IJCAI 2022 (Survey Track), SoCS 2022, RCRA 2022, AAAI 2021 (Senior PC), IJCAI 2021 (Senior PC), UAI 2021, KR 2021, ICML 2021, NeurIPS 2021, SAT 2021, CPAIOR 2021, SOCS 2021, IJCAI 2021 (survey track), AAAI 2021 (demo track), XAI

AAAI 2021, IJCAI 2020 (Area Chair), AAAI 2020 (Senior PC), KR 2020, ECAI 2020 (Senior PC), SAT 2020, IJCAI 2020 (survey track), AAAI 2020 (demo track), NeurIPS 2020, ICTAI 2020, RCRA 2020, IJCAI 2019 (Senior PC), CAV 2019, CP 2019 (Senior PC), SAT 2019, AAAI 2019 (demo track), SoCS 2019, EPIA 2019, AAAI 2018, IJCAI 2018 (Senior PC), SAT 2018, LPAR 2018, IBERAMIA 2018, IVSW 2018, RCRA 2018, IJCAI 2017 (Senior PC), AAAI 2017, LPAR 2017, EPIA 2017, LATA 2017, SAT 2017 PoCR Workshop, RCRA 2017, IJCAI 2016, SAT 2016, ECAI 2016, IBERAMIA 2016, IVSW 2016, RCRA 2016, IJCAI 2015, CP 2015, SAT 2015, RCRA 2015, DIFTS 2015, ECAI 2014, CAV 2014, SAT 2014, ISCC 2014, RCRA 2014, DIFTS 2014, CP 2014 ModRef Workshop,

Other Service (Since 2009)

- 2017-2018. Coordinated the proposal of a Master Degree in Data Science (MDS), Faculty of Science, University of Lisbon, Portugal. MDS has been offered by the Faculty of Science since 2018/19.
- 2016-2017. Coordinated the proposal of a Post-Graduation in Data Science (PGDS), Faculty of Science, University of Lisbon, Portugal. PGDS has been offered by the Faculty of Science since 2017/18.
- 2017-2018. Coordinator, Post-Graduation in Data Science, Faculty of Science, University of Lisbon, Portugal.
- 2016-2017. Academic assessment panel member, Faculty of Science, University of Lisbon, Portugal.
- Sep 2014-Aug 2015. Research Postgraduate Director, School of Computer Science and Informatics, University College Dublin, Ireland.
- Sep 2014-Aug 2015. Member of the Executive Committee, School of Computer Science and Informatics, University College Dublin, Ireland.
- Sep 2014-Aug 2015. Member of the Executive Committee, Complex and Adaptive Systems Laboratory (CASL), University College Dublin, Ireland.
- Sep 2013-Sep 2014. Member of Research & Innovation Committee, School of Computer Science and Informatics, University College Dublin, Ireland.
- Jan 2011-Dec 2012. Vice-President for Postgraduate Studies, Department of Computer Science and Engineering, Instituto Superior Técnico, Lisbon, Portugal.
- Jan 2011-Dec 2012. Coordinator, PhD Program in Information Systems and Computer Engineering, Instituto Superior Técnico, Lisbon, Portugal.
- 2013. Area Coordinator for Computer Science, PhD and Post-Doctoral grant applications, FCT, Portugal.
- 2016-2017. Evaluation Panel Member, FCT, Portugal.
- 2015. Research Proposal Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC), Canada.
- 2013-2014. Research Proposal Reviewer, Czech Science Foundation (GACR), Czech Republic.
- 2013. Research Proposal Reviewer, Agence Nationale de la Recherche (ANR), France.
- 2010-2013. Internal reviewer of research grant pre-proposals, University College Dublin.
- 2010-2015. Member of the scientific board, PhD Program in Information Systems and Computer Engineering, Instituto Superior Técnico, Lisbon, Portugal.
- 2010-2014. Member of the scientific board, Master Degree (MSc) in Information Systems and Computer Engineering, Instituto Superior Técnico, Lisbon, Portugal.
- 2010. Member & Chair of Computer Science Expert Panel, Research Council for Natural Sciences and Engineering (AKA), Finland.
- 2009-2011. Computer Science Expert Panel Member, Research Council for Natural Sciences and Engineering (AKA), Finland.

Post-Doctoral Supervision

Supervisor of Yacine Izza (Post-doctoral researcher, Apr 2020 - Nov 2022), António Morgado (Post-doctoral researcher, Mar 2011 - Sep 2019), Alexey Ignatiev (Post-doctoral researcher, Feb 2012 - Sep 2019), Carlos Mencía (Post-doctoral researcher, Nov 2013 - Oct 2015), Alessandro Previti (Post-doctoral researcher, Jul 2015 - Sep 2015), Mikolas Janota (Post-doctoral researcher, Apr 2011 - Aug 2015), Anton Belov (Post-doctoral researcher, Dec 2010 - Mar 2014), Ruben Martins (Post-doctoral researcher, Nov 2013 - Dec 2013), Federico Heras (Post-doctoral researcher, Aug 2010 - Mar 2013), Scott Cotton (Post-doctoral researcher, Oct 2010 - Dec 2010), Robert Quigley (Post-doctoral researcher, Jun 2009 - Sep 2010), Ashish Darbari (Post-doctoral researcher, Sep 2008 - Feb 2009), Florian Letombe (Post-doctoral researcher, Jun 2007 - May 2008), and Jordi Planes (Post-doctoral researcher, Apr 2007 - Mar 2008).

Graduate Supervision

Supervisor of Paulo Flores (PhD student, 1998-2001), Ines Lynce (PhD student, 2001-2005), Vasco Manquinho (PhD student, 1999-2006), António Morgado (PhD student, 2006-2010), Huan Chen (PhD student, 2008-2013), Alessandro Previti (PhD student 2012-2015), Fareed Arif (PhD student 2013-2016), Xuanxiang Huang (PhD student 2020-date), Olivier Letoffe (PhD student 2022-date), Mahdi Tavassoli (PhD student 2022-date), Thomas Gerspacher (PhD student 2020-2021,dnf), and Xuanye An (PhD student 2012-2013,dnf).

Co-supervisor of Ateet Bhalla (PhD student, 2001-2005), Ana Sofia Graça (PhD student, 2006-2010), John Colley (PhD student, 2006-2010), Lucas Cordeiro (PhD student 2008-2011), and Paulo Matos (PhD student 2006-2010,dnf).

Supervisor of Vasco Manquinho (MSc student, 1996-1999), Luis Baptista (MSc student, 1998-2000), Inês Lynce (MSc student, 2000-2001), Elsa Carvalho (MSc student, 2002-2004), António Morgado (MSc student, 2003-2006), Paulo Matos (MSc student, 2003-2006), Kutay Ergin (MSc student 2007), and Filipe Pereira (MSc, 2017).

Co-supervisor of Luis Guerra e Silva (MSc student, 1996-1999), Danilo Vendraminetto (MSc student, 2010-2011), Anicet Bart (MSc student, 2012), D. Leitão (MSc, 2015), and L. Riscado (MSc, 2015).

Habilitation Committees/Examinations/Evaluations (Since 2010)

- 2018: Paulo Leitão, Faculty of Engineering, University of Porto, Porto, Portugal.
- 2016: Luís Manuel Carriço, Faculty of Science University of Lisbon, Portugal; Alberto M. Rodrigues da Silva, Faculty of Engineering (IST), University of Lisbon, Lisbon, Portugal.
- 2015: Jorge M. M. Sousa Pinto, University of Minho, Braga, Portugal.
- 2012: José C. Monteiro, Technical University of Lisbon, Lisbon, Portugal.
- 2011: Ana M. Paiva, Tech. Univ. of Lisbon, Portugal; Rui G. Crespo, Tech. Univ. of Lisbon, Portugal.
- 2010: Daniel Le Berre, Université d'Artois, Lens, France.

PhD Thesis Committees/Examinations/Evaluations (Since 2007)

- 2023: Andre Schidler, Tech. Univ. Wien, Austria (External Examiner)
- 2022: Stephan Waldchen, Tech. Univ. Berlin, Germany (External Examiner)
- 2021: Jaroslav Bendik, Masaryk University, Czech Republic (External Reviewer & Examiner)
- 2020: Sebastiano Frabrizio Finocchiaro, Politecnico di Torino, Italy (External Reviewer & Examiner); Romain Wallon, Universite d'Artois, France (External Examiner); Naziha Sendi, Universite Paris-Saclay, France (External Examiner) John Tornblom, Linkoping University, Sweden (Licenciate Thesis, Opponent)
- 2017: Jorge Gomes, University of Lisbon, Portugal.
- 2016: Nicholas Downing, University of Melbourne, Melbourne, Australia (External Reviewer); José Nuno de Pinho Cardoso, Univ. Porto, Porto, Portugal (External Member).
- 2015: João Paiva, IST/Univ. of Lisbon, Portugal (President of Thesis Committee).
- 2014: Oksana Denysyuk, IST/Univ. of Lisbon, Portugal (President of Thesis Committee); Miguel Pardal, IST/Univ. of Lisbon, Portugal (President of Thesis Committee); Pedro Alves, IST/Univ. of Lisbon, Portugal (President of Thesis Committee).
- 2013: Siert Wieringa, Aalto University, Helsinki, Finland (Pre-Examiner); Alexandra Goultiaeva, University of Toronto, Toronto, Canada (External Member); Ignasi Abío Roig, Universidad Politécnica de Catalunya, Barcelona, Spain (External Member); William Klieber, Carnegie Mellon University, Pittsburgh, PA, USA (External Member); António Brisson Lopes, IST/Tech. Univ. of Lisbon, Portugal (President of Thesis Committee); Luis Tarrataca, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee); Joana Gonçalves, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee); Joana Pardal, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee).
- 2012: Ignasi Abío Roig, Universidad Politécnica de Catalunya, Barcelona, Spain (Reviewer); Tiago Guerreiro, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee); João Bispo, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee); Rui Joaquim, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee).
- 2011: Alexandra Carvalho, IST/Tech. Univ. of Lisbon, Portugal (President of Thesis Committee); Fernando Batista, IST/Technical Univ. of Lisbon, Portugal (President of Thesis Committee); Ana Sofia Graça, IST/Technical University of Lisbon, Portugal.
- 2010: Marco Vargas Correia, New University of Lisbon, Portugal.
- 2009: Luis Guerra e Silva, IST/Technical University of Lisbon, Portugal.
- 2008: Federico Heras, Polytechnic Univ. of Catalunya, Barcelona, Spain; Niklas Sörensson, Chalmers University,

Gothenburg, Sweden; Matti Järvisalo, Helsinki Univ. of Technology, Helsinki, Finland (Pre-Examiner); René Krenz, Royal Inst. of Technology (KTH), Stockholm, Sweden (Opponent).

- 2007: Edd Turner, University of Southampton, Southampton, UK; Juan Navarro, University of Manchester, Manchester, UK; Ateet Bhalla, IST/Technical University of Lisbon, Portugal.

Teaching Experience (Since 2005)

- At Faculty of Science, University of Lisbon (2016-date):
  - "Foundations of the Semantic Web." MSc course (since 2017/18).
  - "Knowledge Engineering." Third year course (since 2016/17).
  - "Machine Learning." MSc course (2016/17, 2017/18).
  - "Introduction to Artificial Intelligence." Third year course (since 2017/18).
  - "Introduction to Research in Data Science." MSc course (since 2018/19).
  - "Declarative Computing." MSc course (2016/17).
  - "Intelligent Systems." Second year course (2015/16).
  - "Research Topics." PhD requirement course (since 2017/18).
  - "Intelligent Computing Systems." PhD course (since 2016/17).
  - "Graduate Research Seminars." PhD requirement course (2016/17).
- At IST, University of Lisbon (2011-2015):
  - "Compilers." Third year course.
  - "Algorithms for Computational Logic." MSc course.
  - "Design and Verification of Software." MSc course.
  - "Analysis and Design of Algorithms." Third year course.
  - "Introduction to Algorithms and Data Structures." First year course.
- At University College Dublin (2010-2014):
  - "Foundations of Computing." Third year course.
- At the University of Southampton (Oct 2005-Jan 2009):
  - "Compiler Engineering." Second year course.
  - "Digital System Design." MSc course.
  - "Digital System Design." Third year course.
  - "Design and Test of Digital Systems." Second year course.
  - "Introduction to Formal Methods." First year course.
  - Postgraduate seminars: "Boolean Satisfiability and Model Checking".

Citation Data & Impact

- Google Scholar Profile: citation count: **15256**; h-index: **59**. (Data from 04 Mar 2023.)

Patents, IP Licensing, Consulting & Entrepreneurial Activity

- May 2018-date. Consultant for PASS S.A., on data and knowledge engineering, and machine learning technologies.
- Aug 2009, Irish Patent Application, "Method and System for Automatic Test Pattern Generation".
- Oct 2005-Jan 2007. Acting CTO, AerieLogic s.a.r.l., France.
- Feb 2006, Portuguese Patent 103434, "Method and System for the Inference of Haplotypes with Pure Parsimony using Propositional Satisfiability".
- 2003-2005, Model Checker MCSAT licensed to TransEDA Ltd.
- Jan 2003-Dec 2004, Acting CEO, iKnow Lda., Portugal.
- 2003-2004, SAT solvers CQuest and JQuest licensed to TNI-Valiosys S.A.
- GRASP SAT solver licensed to IBM Corp. in 1997 and in 2000, and to TNI-Valiosys S.A. in 2001.

Professional Memberships

Member of the IEEE, Fellow since Jan 2016.

Member of the ACM.