Alexey S. Ignatiev

Optimisation group, FIT@Monash
Email: alexey.ignatiev@monash.edu
URL: https://alexeyignatiev.github.io/

Born: October 27, 1983 — Irkutsk, Russia
Nationality: Russian

Current position

Senior Lecturer, Optimisation group, Faculty of IT, Monash University, Australia

Research interests

Decision procedures and discrete optimization algorithms: Boolean satisfiability (SAT) and its extensions including MaxSAT, MinSAT, QBF, QMaxSAT, SMT/MaxSMT. Formal methods in software/hardware synthesis/verification/repair and artificial intelligence.

Appointments held

2019–date *Senior Lecturer*, Faculty of IT, Monash University, Australia
2019–2019 *Researcher*, Faculty of Sciences, University of Lisbon, Portugal
2016–2019 *Postdoctoral researcher*, Faculty of Sciences, University of Lisbon, Portugal
2012–2016 *Postdoctoral researcher*, INESC-ID, IST, University of Lisbon, Portugal
2009–2012 *Researcher*, Institute for System Dynamics and Control Theory SB RAS, Irkutsk, Russia
2007–2008 *Software engineer*, Delcam plc., Irkutsk, Russia

Education

2010 PhD in Computer Science, Institute for System Dynamics and Control Theory SB RAS
Title: *"Methods of inverting discrete functions with the use of binary decision diagrams"*
Advisor: *Alexander A. Semenov*

2006 MSc in Applied Mathematics, Irkutsk State University
Title: *"Solving sets of logical equations with BDDs"*
Advisor: *Alexander A. Semenov*

Awards

2020a RC2 MaxSAT solver won *gold* in both unweighted and weighted categories of the Top-k track of MaxSAT Evaluation 2020

2020b Our paper *"Computing Optimal Decision Sets with SAT"* is recognised as the best paper in the *CP/ML Track* of CP 2020.
RC2 MaxSAT solver won *gold* in both unweighted and weighted categories of the Top-k track of MaxSAT Evaluation 2020

2019 RC2 MaxSAT solver won *gold* in both complete categories (unweighted and weighted) of the main track of MaxSAT Evaluation 2019

2018 RC2 MaxSAT solver won *gold* in both complete categories (unweighted and weighted) of the main track of MaxSAT Evaluation 2018

2016 MSCG MaxSAT solver is one of the best overall MaxSAT solvers in the industrial category of the Eleventh Evaluation of MaxSAT solvers (*1st* and *2nd* place in plain industrial and weighted industrial categories, resp.)

2015 MSCG MaxSAT solver is one of the best overall MaxSAT solvers in the industrial category of the Tenth Evaluation of MaxSAT solvers (*1st*, *2nd*, and *1st* place in plain industrial, partial crafted, and weighted industrial categories, resp.)

2014 MSCG MaxSAT solver is one of the best overall MaxSAT solvers in the industrial category of the Ninth Evaluation of MaxSAT solvers among non-portfolio solvers (*4th*, *3rd*, and *2nd* place in plain, partial, and weighted industrial categories, resp.)

Grants & project participation

2023–date DARPA ANSR grant HARNESS (FA8750-23-2-1016)
2019–2022 FCT researcher grant SAMPLE (CEECIND/04549/2017)
2018–2021 FCT grant FaultLocker (*co-PI*) (PTDC/CCI-COM/29300/2017)
2018–2021 FCT grant ABSOLV (LISBOA-01-0145-FEDER-028986)
2017–2020 FCT postdoctoral grant SAFETY (SFRH/BPD/120315/2016)
2013–2015 FCT grant POLARIS (PTDC/EIA-CCO/123051/2010)
2012–2013 FCT grant ATTEST (CMU-PT/ELE/0009/2009)
2011–2012 Grant 11-07-00377-a of Russian Foundation for Basic Research
2007–2009 Grant 07-01-00400-a of Russian Foundation for Basic Research

Publications & talks

Journal papers

J2023a Y. Izza, X. Huang, A. Ignatiev, N. Narodytska, M. C. Cooper, J. Marques-Silva. "On computing probabilistic abductive explanations". In *International Journal of Approximate Reasoning*. vol. 159, pp. 108939 (2023)

J2023b J. Marques-Silva, A. Ignatiev. "No Silver Bullet: Interpretable ML Models Must Be Explained". In *Frontiers in Artificial Intelligence*. vol. 6, pp. 1–15 (2023)

J2022 Y. Izza, A. Ignatiev, J. Marques-Silva. "On Tackling Explanation Redundancy in Decision Trees". In *Journal of Artificial Intelligence Research*, vol. 75, pp. 261–321 (2022)

J2021a M. L. Bonet, S. Buss, A. Ignatiev, A. Morgado, and J. Marques-Silva. "Propositional Proof Systems Based on Maximum Satisfiability". In *Artificial Intelligence*, vol. 300, pp. xx–xx (2021)

J2021b J. Yu, A. Ignatiev, P. J. Stuckey, P. Le Bodic. "Learning Optimal Decision Sets and Lists with SAT". In *Journal of Artificial Intelligence Research*, vol. 72, pp. 1251–1279 (2021)

J2019 A. Ignatiev, A. Morgado, and J. Marques-Silva. "RC2: An Efficient MaxSAT Solver". In *Journal on Satisfiability, Boolean Modeling and Computation*, vol. 11, pp. 53–64 (2019)

J2016a A. Ignatiev, M. Janota, and J. Marques-Silva. "Quantified Maximum Satisfiability". In *Constraints*, vol. 21(2), pp. 277–302 (2016)

J2016b A. Ignatiev, A. Morgado, J. Planes, and J. Marques-Silva. "Maximal Falsifiability: Definitions, Algorithms, and Applications". In *AI Communications*, vol. 29(2), pp. 351–370 (2016)

J2015 A. Morgado, A. Ignatiev, and J. Marques-Silva. "MSCG: Robust Core-Guided MaxSAT Solving. System Description". In *Journal on Satisfiability, Boolean Modeling and Computation*, vol. 9, pp. 129–134 (2015)

Conference papers

C2023a J. Yu, A. Ignatiev, P. J. Stuckey, N. Narodytska, J. Marques-Silva. "Eliminating The Impossible, Whatever Remains Must Be True". *In Proc. 37th AAAI Conference on Artificial Intelligence (AAAI'23).* pp. 4123–4131 (2023)

C2023b Y. Izza, A. Ignatiev, J. Marques-Silva. "On Tackling Explanation Redundancy in Decision Trees". *In Proc. 32nd International Joint Conference on Artificial Intelligence (IJCAI'23).* pp. 6900–6904 (2023)

C2023c J. Yu, A. Ignatiev, P. J. Stuckey. "From Formal Boosted Tree Explanations to Interpretable Rule Sets". *29th International Conference on Principles and Practice of Constraint Programming (CP'23).* pp. 38:1–38.21 (2023)

Y. Izza, A. Ignatiev, J. Marques-Silva. "On Tackling Explanation Redundancy in Decision Trees". *In Proc. 32nd International Joint Conference on Artificial Intelligence (IJCAI'23).* pp. 6900–6904 (2023)

C2022a J. Marques-Silva, A. Ignatiev. "Delivering Trustworthy AI through Formal XAI". *In Proc. 36th AAAI Conference on Artificial Intelligence (AAAI'22).* pp. 12342–12350 (2022)

C2022b A. Ignatiev, Y. Izza, P. J. Stuckey, J. Marques-Silva. "Using MaxSAT for Efficient Explanations of Tree Ensembles". *In Proc. 36th AAAI Conference on Artificial Intelligence (AAAI'22).* pp. 3776–3785 (2022)

C2022c X. Huang, Y. Izza, A. Ignatiev, M. C. Cooper, N. Asher, J. Marques-Silva. "Tractable Explanations for d-DNNF Classifiers". *In Proc. 36th AAAI Conference on Artificial Intelligence (AAAI'22).* pp. 5719–5728 (2022)

C2022d A. Shrotri, N. Narodytska, A. Ignatiev, K. S. Meel, J. Marques-Silva, M. Vardi. "Constraint-Driven Explanations of Black-Box ML Models". *In Proc. 36th AAAI Conference on Artificial Intelligence (AAAI'22).* pp. 8304–8314 (2022)

C2021a A. Ignatiev, E. Lam, P. J. Stuckey, J. Marques-Silva. "A Scalable Two Stage Approach to Computing Optimal Decision Sets". *In Proc. 35th AAAI Conference on Artificial Intelligence (AAAI'21)*. pp. 3806–3814 (2021)

C2021b G. Cabodi, P. E. Camurati, A. Ignatiev, J. Marques-Silva, M. Palena, P. Pasini. "Optimizing Binary Decision Diagrams for Interpretable Machine Learning Classification". *In Proc. Design, Automation & Test in Europe Conference & Exhibition (DATE'21)*. pp. 1122–1125 (2021)

C2021c J. Marques-Silva, T. Gerspacher, M. C. Cooper, A. Ignatiev, N. Narodytska. "Explanations for Monotonic Classifiers". *In Proc. 38th International Conference on Machine Learning (ICML'21)*. PMLR, vol. 139, pp. 7469–7479 (2021)

C2021d A. Ignatiev, J. Marques Silva. "SAT-Based Rigorous Explanations for Decision Lists". In *Proc. 24th International Conference on Theory and Applications of Satisfiability Testing (SAT'21)*. Lecture Notes in Computer Science, vol. 12831, pp. 251–269 (2021)

C2021e S. Kochemazov, A. Ignatiev, J. Marques-Silva. "Assessing Progress in SAT Solvers Through the Lens of Incremental SAT". In *Proc. 24th International Conference on Theory and Applications of Satisfiability Testing (SAT'21)*. Lecture Notes in Computer Science, vol. 12831, pp. 280–298 (2021)

C2021f A. Ignatiev, J. Marques-Silva, N. Narodytska, P. J. Stuckey. "Reasoning-Based Learning of Interpretable ML Models". In *Proc. 30th International Joint Conference on Artificial Intelligence (IJCAI'21)*. pp. 4458–4465 (2021)

C2021g X. Huang, Y. Izza, A. Ignatiev, and J. Marques-Silva. "On Efficiently Explaining Graph-Based Classifiers". In *Proc. 18th Conference on Principles of Knowledge Representation and Reasoning (KR'21)*. (2021)

c2021h A. Semenov, D. Chivilikhin, A. Pavlenko, I. Otpuschennikov, V. Ulyantsev, and A. Ignatiev. "Evaluating the Hardness of SAT Instances Using Evolutionary Optimization Algorithms". In *Proc. 27th International Conference on Principles and Practice of Constraint Programming (CP'21)*. (2021)

C2020a O. Zaikin, A. Ignatiev, J. Marques-Silva. "Branch Location Problems with Maximum Satisfiability". In *Proc. 24th European Conference on Artificial Intelligence (ECAI'20)*. Frontiers in Artificial Intelligence and Applications, vol. 325, pp. 379–386 (2020)

C2020b A. Ignatiev. "Towards Trustable Explainable AI". In *Proc. 29th International Joint Conference on Artificial Intelligence (IJCAI'20)*. pp. 5154–5158 (2020)

C2020c A. Ignatiev, M. Cooper, M. Siala, E. Hebrard, and J. Marques-Silva. "Towards Formal Fairness in Machine Learning". In *Proc. 26th International Conference on Principles and Practice of Constraint Programming (CP'20)*. Lecture Notes in Computer Science, vol. 12333, pp. 952–970 (2020)

C2020d J. Yu, A. Ignatiev, P. J. Stuckey, and P. Le Bodic. "Computing Optimal Decision Sets with SAT". In *Proc. 26th International Conference on Principles and Practice of Constraint Programming (CP'20)*. Lecture Notes in Computer Science, vol. 12333, pp. 846–867 (2020)

C2020e J. Marques-Silva, T. Gerspacher, M. Cooper, A. Ignatiev, N. Narodytska "Explaining Naive Bayes and Other Linear Classifiers with Polynomial Time and Delay". In *Proc. 34th Conference on Neural Information Processing Systems (NeurIPS'20)*. (2020)

C2020f A. Ignatiev, N. Narodytska, N. Asher, J. Marques-Silva. "From Contrastive to Abductive Explanations and Back Again". In *Proc. 19th Conference on Advances in Artificial Intelligence (AI*IA'20)*. Lecture Notes in Computer Science, vol. 12414, pp. 335–355 (2020)

C2019a A. Ignatiev, N. Narodytska, J. Marques-Silva. "Abduction-Based Explanations for Machine Learning Models". In *Proc. 33rd AAAI Conference on Artificial Intelligence (AAAI'19)*. pp. 1511–1519 (2019)

C2019b A. Morgado, A. Ignatiev, M. L. Bonet, J. Marques-Silva, S. Buss. "DRMaxSAT with MaxHS: First Contact". In *Proc. 22nd International Conference on Theory and Applications of Satisfiability Testing (SAT'19)*. Lecture Notes in Computer Science, vol. 11628, pp. 239–249 (2019)

C2019c N. Narodytska, A. Shrotri, K. Meel, A. Ignatiev, J. Marques-Silva. "Assessing Heuristic Machine Learning Explanations with Model Counting". In *Proc. 22nd International Conference on Theory and Applications of Satisfiability Testing (SAT'19)*. Lecture Notes in Computer Science, vol. 11628, pp. 267–278 (2019)

C2019d C. Mencía, O. Kullmann, A. Ignatiev, J. Marques-Silva. "On Computing the Union of MUSes". In *Proc. 22nd International Conference on Theory and Applications of Satisfiability Testing (SAT'19)*. Lecture Notes in Computer Science, vol. 11628, pp. 211–221 (2019)

C2019e A. Ignatiev, A. Morgado, G. Weissenbacher, J. Marques-Silva. "Model-Based Diagnosis with Multiple Observations". In *Proc. 28th International Joint Conference on Artificial Intelligence (IJCAI'19)*. pp. 1108–1115 (2019)

C2019f I. Zakirzyanov, A. Morgado, A. Ignatiev, V. Ulyantsev, J. Marques-Silva. "Efficient Symmetry Breaking for SAT-Based Minimum DFA Inference". In *Proc. 13th International Conference on Language and Automata Theory and Applications (LATA'19)*. Lecture Notes in Computer Science, vol. 11417, pp. 159–173 (2019)

C2019g A. Ignatiev, N. Narodytska, J. Marques-Silva. "On Relating Explanations and Adversarial Examples". In *Proc. 33rd Conference on Neural Information Processing Systems (NeurIPS'19)*. pp. 15857–15867 (2019)

C2018a M. L. Bonet, S. Buss, A. Ignatiev, J. Marques-Silva, A. Morgado. "MaxSAT Resolution with the Dual Rail Encoding". In *Proc. 32nd AAAI Conference on Artificial Intelligence (AAAI'18)*. pp. 6565–6572 (2018)

C2018b A. Semenov, O. Zaikin, I. Otpuschennikov, S. Kochemazov, A. Ignatiev. "On Cryptographic Attacks Using Backdoors for SAT". In *Proc. 32nd AAAI Conference on Artificial Intelligence (AAAI'18)*. pp. 6641–6648 (2018)

C2018c A. Ignatiev, A. Morgado, J. Marques-Silva. "PySAT: A Python Toolkit for Prototyping with SAT Oracles". In *Proc. 21st International Conference on Theory and Applications of Satisfiability Testing (SAT'18)*. Lecture Notes in Computer Science, vol. 10929, pp. 428–437 (2018)

C2018d A. Ignatiev, F. Pereira, N. Narodytska, J. Marques-Silva. "A SAT-Based Approach to Learn Explainable Decision Sets". In *Proc. 9th International Joint Conference on Automated Reasoning (IJCAR'18)*. Lecture Notes in Artificial Intelligince, vol. 10900, pp. 627–645 (2018)

C2018e N. Narodytska, A. Ignatiev, F. Pereira, J. Marques-Silva. "Learning Optimal Decision Trees with SAT". In *Proc. 27th International Joint Conference on Artificial Intelligence (IJCAI'18)*. pp. 1362–1368 (2018)

C2017a R. Peñaloza, C. Mencía, A. Ignatiev, J. Marques-Silva. "Lean Kernels in Description Logics". In *Proc. 14th Extended Semantic Web Conference (ESWC'17)*. Lecture Notes in Computer Science, vol. 10249, pp. 518–533 (2017)

C2017b A. Ignatiev, A. Morgado, J. Marques-Silva. "Cardinality Encodings for Graph Optimization Problems". In *Proc. 26th International Joint Conference on Artificial Intelligence (IJCAI'17)*. pp. 652–658 (2017)

C2017c A. Ignatiev, A. Morgado, J. Marques-Silva. "On Tackling the Limits of Resolution in SAT Solving". In *Proc. 20th International Conference on Theory and Applications of Satisfiability Testing (SAT'17)*. Lecture Notes in Computer Science, vol. 10491, pp. 164–183 (2017)

C2017d J. Marques-Silva, A. Ignatiev, A. Morgado. "Horn Maximum Satisfiability: Reductions, Algorithms & Applications". In *Proc. 18th EPIA Conference on Artificial Intelligence (EPIA'17)*. Lecture Notes in Computer Science, vol. 10423, pp. 681–694 (2017)

C2017e A. Previti, A. Ignatiev, M. Järvisalo, J. Marques-Silva. "On Computing Generalized Backbones". In *Proc. 29th International Conference on Tools with Artificial Intelligence (ICTAI'17)*. pp. 1050–1056 (2017)

C2016a C. Mencía, A. Ignatiev, A. Previti, and J. Marques-Silva. "MCS Extraction with Sublinear Oracle Queries". In *Proc. 19th International Conference on Theory and Applications of Satisfiability Testing (SAT'16)*. Lecture Notes in Computer Science, vol. 9710, pp. 342–360 (2016)

C2016b M. F. Arif, C. Mencía, A. Ignatiev, N. Manthey, R. Peñaloza, and J. Marques-Silva. "BEACON: An Efficient SAT-Based Tool for Debugging EL+ Ontologies". In *Proc. 19th International Conference on Theory and Applications of Satisfiability Testing (SAT'16)*. Lecture Notes in Computer Science, vol. 9710, pp. 521–530 (2016)

C2016c A. Ignatiev, A. Morgado, and J. Marques-Silva. "Propositional Abduction with Implicit Hitting Sets". In *Proc. 22nd European Conference on Artificial Intelligence (ECAI'16)*. Frontiers in Artificial Intelligence and Applications, vol. 285, pp. 1327–1335 (2016)

C2016d A. Ignatiev, A. Previti, and J. Marques-Silva. "On Finding Minimum Satisfying Assignments". In *Proc. 22nd International Conference on Principles and Practice of Constraint Programming (CP'16)*. Lecture Notes in Computer Science, vol. 9892, pp. 287–297 (2016)

C2016e X. Si, X. Zhang, V. Manquinho, M. Janota, A. Ignatiev, and M. Naik. "On Incremental Core-Guided MaxSAT Solving". In *Proc. 22nd International Conference on Principles and Practice of Constraint Programming (CP'16)*. Lecture Notes in Computer Science, vol. 9892, pp. 473–482 (2016)

C2016f J. Marques-Silva, A. Ignatiev, C. Mencía, R. Peñaloza. "Efficient Reasoning for Inconsistent Horn Formulae". In *Proc. 15th European Conference On Logics In Artificial Intelligence (JELIA'16)*. Lecture Notes in Computer Science, vol. 10021, pp. 336–352 (2016)

C2015a A. Previti, A. Ignatiev, A. Morgado, and J. Marques-Silva. "Prime Compilation of Non-Clausal Formulae". In *Proc. 24th International Joint Conference on Artificial Intelligence (IJCAI'15)*. pp. 1980–1987 (2015)

C2015b J. Marques-Silva, M. Janota, A. Ignatiev, and A. Morgado. "Efficient Model Based Diagnosis with Maximum Satisfiability". In *Proc. 24th International Joint Conference on Artificial Intelligence (IJCAI'15)*. pp. 1966–1972 (2015)

C2015c A. Ignatiev, A. Previti, M. Liffiton, and J. Marques-Silva. "Smallest MUS Extraction with Minimal Hitting Set Dualization". In *Proc. 21st International Conference on Principles and Practice of Constraint Programming (CP'15)*. Lecture Notes in Computer Science, vol. 9255, pp. 173–182 (2015)

C2015d A. Ignatiev, A. Previti, and J. Marques-Silva. "SAT-Based Formula Simplification". In *Proc. 18th International Conference on Theory and Applications of Satisfiability Testing (SAT'15)*. Lecture Notes in Computer Science, vol. 9340, pp. 287–298 (2015)

C2014a A. Ignatiev, M. Janota, and J. Marques-Silva. "Towards Efficient Optimization in Package Management Systems". In *Proc. 36th International Conference on Software Engineering (ICSE'14)*. pp. 745–755 (2014)

C2014b A. Ignatiev, A. Morgado, and J. Marques-Silva. "On Reducing Maximum Independent Set to Minimum Satisfiability". In *Proc. 17th International Conference on Theory and Applications of Satisfiability Testing (SAT'14)*. Lecture Notes in Computer Science, vol. 8561, pp. 103–120 (2014)

C2014c J. Marques-Silva, A. Ignatiev, A. Morgado, V. Manquinho, and I. Lynce. "Efficient Autarkies". In *Proc. 21st European Conference on Artificial Intelligence (ECAI'14)*. Frontiers in Artificial Intelligence and Applications, vol. 264, pp. 603–608 (2014)

C2014d A. Ignatiev, A. Morgado, V. Manquinho, I. Lynce, and J. Marques-Silva. "Progression in Maximum Satisfiability". In *Proc. 21st European Conference on Artificial Intelligence (ECAI'14)*. Frontiers in Artificial Intelligence and Applications, vol. 264, pp. 453–458 (2014)

C2013a A. Ignatiev, M. Janota, and J. Marques-Silva. "Quantified Maximum Satisfiability: A Core-Guided Approach". In *Proc. 16th International Conference on Theory and Applications of Satisfiability Testing (SAT'13)*. Lecture Notes in Computer Science, vol. 7962, pp. 250–266 (2013)

C2013b A. Ignatiev, A. Morgado, J. Planes, and J. Marques-Silva. "Maximal Falsifiability: Definitions, Algorithms, and Applications". In *Proc. 19th International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR'13)*. Lecture Notes in Computer Science, vol. 8312, pp. 439–456 (2013)

C2011 A. Ignatiev and A. Semenov. "DPLL+ROBDD Derivation Applied to Inversion of Some Cryptographic Functions". In *Proc. 14th International Conference on Theory and Applications of Satisfiability Testing (SAT'11)*. Lecture Notes in Computer Science, vol. 6695, pp. 76–89 (2011)

C2009 A. Ignatiev, A. Semenov, and D. Bespalov. "Binary Decision Diagrams in Parallel Algorithms for Discrete Function Inversion" (in Russian). In *Proc. 3rd International Conference on Parallel Computing Technologies (PAVT'09)*. pp. 688–696 (2009)

Refereed workshop papers

W2020a A. Ignatiev, N. Narodytska, and J. Marques-Silva. "On Formal Reasoning about Explanations". In *Proc. 27th RCRA International Workshop on Experimental Evaluation of Algorithms for solving problems with combinatorial explosion* (2021)

W2020b A. Ignatiev, N. Narodytska, N. Asher, and J. Marques-Silva. "On Relating "Why?" and "Why Not?" Explanations". In *Proc. 27th RCRA International Workshop on Experimental*

Evaluation of Algorithms for solving problems with combinatorial explosion (2021)

W2017 A. Ignatiev, J. Marques-Silva, C. Mencía, R. Peñaloza. "Debugging EL^+ Ontologies through Horn MUS Enumeration". In *Proc. 30th International Workshop on Description Logics (DL'17)*.

W2014 A. Ignatiev, A. Morgado, J. Planes, and J. Marques-Silva. "Maximal Falsifiability: Definitions, Algorithms, and Applications". In *Proc. 21st RCRA International Workshop on Experimental Evaluation of Algorithms for solving problems with combinatorial explosion* (2014)

Talks

T2023 "Formal Explainability in Artificial Intelligence". *ESSAI 2023 Course (together with Joao Marques-Silva and Nina Narodytska).* Ljubljana. July 24–27, 2023.

T2022a "Using MaxSAT for Efficient Explanations of Tree Ensembles". *AAAI.* Online. February 27, 2022.

T2022b "Formal Explainable AI". *CP Tutorial.* Haifa, Israel. August 4, 2022.

T2021a "A Scalable Two Stage Approach to Computing Optimal Decision Sets". *AAAI.* Online. February 5, 2021.

T2021b "SAT-Based Rigorous Explanations for Decision Lists". *SAT.* Online. July 7, 2021.

T2021c "Reasoning-Based Learning of Interpretable ML Models". *IJCAI.* Online. August 23, 2021.

T2021d "Clauses and Beyond: On Fast Prototyping with SAT Oracles". *Dagstuhl Seminar on "Extending the Synergies Between SAT and Description Logics".* Online. September 8, 2021.

T2021e "Logic-based Explainable AI". *MIAO Video Seminars.* Online. October 15, 2021.

T2021f "From Contrastive to Abductive Explanations and Back Again". *KR.* Online. November 9, 2021.

T2021g "Logic-based Explainable AI". *AI-based OPTIMA Seminar.* Online. November 24, 2021.

T2020a "Rigorous Verification and Explanation of ML Models". *AAAI Tutorial (together with Joao Marques-Silva, Kuldeep Meel and Nina Narodytska).* New York, USA. February 8, 2020.

T2020b "Logic-Enabled Verification and Explanation of ML Models". *IJCAI Tutorial (together with Joao Marques-Silva, Kuldeep Meel and Nina Narodytska).* Online. January 8, 2021.

T2020c "Towards Trustable Explainable AI". *IJCAI Early-Career Spotlight.* Online. January 12, 2021.

T2019a "Abduction-Based Explanations for Machine Learning Models". *AAAI.* Honolulu, USA. January 30, 2019.

T2019b "Computing With SAT Oracles". *IJCAI Tutorial (together with Joao Marques-Silva and Antonio Morgado).* Macau, China. August 12, 2019.

T2019c "Model-Based Diagnosis with Multiple Observations". *IJCAI.* Macau, China. August 14, 2019.

T2018 "On Cryptographic Attacks Using Backdoors for SAT". *AAAI.* New Orleans, USA. February 4, 2018.

T2017a "Cardinality Encodings for Graph Optimization Problems". *IJCAI.* Melbourne, Australia. August 23, 2017.

T2017b "On Tackling the Limits of Resolution in SAT Solving". *SAT.* Melbourne, Australia. August 29, 2017.

T2016a "On Incremental Core-Guided MaxSAT Solving". *CP*. Toulouse, France. September 6, 2016.

T2016b "On Finding Minimum Satisfying Assignments". *CP*. Toulouse, France. September 9, 2016.

T2015a "Efficient Model Based Diagnosis with Maximum Satisfiability". *IJCAI*. Buenos Aires, Argentina. July 31, 2015.

T2015b "Efficient Model Based Diagnosis with Maximum Satisfiability". *RiSE Seminar*. Vienna, Austria. August 14, 2015.

T2014a "Towards Efficient Optimization in Package Management Systems". *ICSE*. Hyderabad, India. June 5, 2014.

T2014b "On Reducing Maximum Independent Set to Minimum Satisfiability". *SAT*. Vienna, Austria. July 14, 2014.

T2014c "Maximal Falsifiability: Definitions, Algorithms, and Applications". *RCRA*. Vienna, Austria. July 17, 2014.

T2013a "Quantified Maximum Satisfiability: A Core-Guided Approach". *SAT*. Helsinki, Finland. July 11, 2013.

T2013b "Maximal Falsifiability: Definitions, Algorithms, and Applications". *LPAR*. Stellenbosch, South Africa. December 15, 2013.

T2011 "DPLL+ROBDD Derivation Applied to Inversion of Some Cryptographic Functions". *SAT*. Ann Arbor, USA. June 19, 2011.

T2009 "Binary Decision Diagrams in Parallel Algorithms for Discrete Function Inversion". *PAVT*. Nizhny Novgorod, Russia. April 2, 2009.

Other activities

• Workshop co-chair of the *International Conference on Theory and Applications of Satisfiability Testing* (SAT) 2024
• Co-organizer of the Workshop on *Pragmatics of SAT* (PoS) 2024
• Co-organizer of the Workshop on *Logic-based Methods in Machine Learning* (LMML) 2022
• Member of the Scientific Advisory Board of *Reasoning Web Summer School* (RW) 2022
• PC member of the *International Conference on Machine Learning* (ICML) 2022, 2023, and 2024
• PC member of the *SIGKDD Conference on Knowledge Discovery and Data Mining* (KDD) 2022
• PC member of the *International Conference on Autonomous Agents and Multiagent Systems* (AAMAS) 2022
• PC member of the *International Conference on Learning Representations* (ICLR) 2022, 2023, and 2024
• SPC member of the *AAAI Conference on Artificial Intelligence* (AAAI) 2022 and 2024
• PC member of the *Conference on Neural Information Processing Systems* (NeurIPS) 2021, 2022, and 2023
• Co-organizer of the CPAIOR 2021 Master Class Day
• Co-organizer of the SAT/SMT/AR Summer School 2019
• SPC member of the *International Joint Conference on Artificial Intelligence* (IJCAI) 2020,

2021, 2023, and 2024
• PC member of the *AAAI Conference on Artificial Intelligence* (AAAI) 2018–2021 and 2023
• PC member of the *International Joint Conference on Artificial Intelligence* (IJCAI) 2015, 2017–2019
• PC member of the *European Conference on Artificial Intelligence* (ECAI) 2020
• PC member of the *International Conference on Theory and Applications of Satisfiability Testing* (SAT) 2017 and 2019–2021, 2023, and 2024
• PC member of the *International Conference on Principles and Practice of Constraint Programming* (CP) 2019 and 2022
• member of the Artifact Evaluation Committee of the *International Conference on Computer-Aided Verification* (CAV) 2019
• PC member of the *Workshop on Pragmatics of SAT* (POS) 2018–2021
• External reviewer for CAV 2014, CP 2018, FMCAD 2017, SAT 2013, SAT 2014, SAT 2015, SAT 2016, SAT 2018, and TACAS 2016