

Jan Jakubův - Scientific CV

Born: October 28, 1981 in Vlašim, Czechoslovakia
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Education

(2007 – 2010) PhD. in Computer Science (Computing): “Generic Process Shape Types and the Poly* System”, at School of Mathematical and Computer Science, Heriot-Watt University, Edinburgh, under the supervision of Dr. J. B. Wells and Prof. F. Kamareddine, thesis defended in October 2010 without corrections.

(2000 – 2006) MSc. in Theoretical Computer Science: “Automated Theorem Proving Using the Tableaux Methods”, at Charles University in Prague, Faculty of Mathematics and Physics, Department of Theoretical Computer Science, under the supervision of Prof. P. Štánek.

Position

(2022 – present) Scientific researcher at Czech Technical University in Prague, Czech Institute of Informatics, Robotics and Cybernetics (CIIRC). Research topics: (1) Powering SMT Solvers by Machine Learning (ERC-CZ/POSTMAN);

(2021 – 2022) Postdoctoral scientific researcher at University of Innsbruck, Department of Computer Science. Research topics: (1) Strong Modular Proof Assistance Reasoning Across Theories (ERC/SMART);

(2015 – 2021) Postdoctoral scientific researcher at Czech Technical University in Prague, Czech Institute of Informatics, Robotics and Cybernetics (CIIRC). Research topics: (1) Artificial Intelligence in Automated Theorem Proving (ERC/AI4REASON);

(2012 – 2015) Postdoctoral scientific researcher at Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Computer Science, Agent Technology Center. Research topics: (1) Air Traffic Control Management, AgentFly project (FAA, since 2012); (2) Domain Independent Multiagent Planning (GAR, since 2013).

Fundings

2021 - present Researcher (team-member) supported by Ministry of Education, Youth and Sports (MEYS / MŠMT) project POSTMAN, LL1902.

2021 - 2022 Researcher (team-member) supported by ERC Project “SMART” Starting Grant no. 714034.

2015 - 2021 Postdoc (team-member) supported by AI4REASON ERC Consolidator grant number 649043.

2012 - 2015 Postdoc (team-member) partially supported by Czech Science Foundation (GA R, grant no. 13-22125S).

2006 - 2009 EPSRC studentship to undertake PhD study at Heriot-Watt University in Edinburgh, funded by EPSRC grant EP/C013573/1.

Research Interests

Artificial Intelligence; Machine Learning; Automated Reasoning; Formalization of Mathematics; Functional Programming; Distributed Computing; Process Calculi; Type Systems; Automated Planning; Multiagent Systems; Multiagent Planning; Air Traffic Control

Teaching

(2021/22) University of Innsbruck, Department of Computer Science: *Discrete Structures* (703069, tutorial, winter).

(2017/18) Czech Technical University in Prague, Faculty of Electrical Engineering: *Functional Programming* (B4B36FUP, tutorial, summer).

(2015/16) & (20016/17) Czech Technical University in Prague, Faculty of Electrical Engineering: *Functional and Logic Programming* (A4(E)B33FLP, tutorials, summer), *Automated Reasoning* (A4M33AU, lecture & tutorials, summer).

(2014/15) Czech Technical University in Prague, Faculty of Electrical Engineering: *Advanced Algorithms* (A4M33PAL, tutorial, winter), *Automated Reasoning* (A4M33AU, lecture & tutorials, summer).

(2013/14) Czech Technical University in Prague, Faculty of Electrical Engineering: *Advanced Algorithms* (A4M33PAL, tutorial, winter), *Automated Reasoning* (A4M33AU, lecture & tutorial, summer), *Functional and Logic Programming* (A4(E)B33FLP, tutorials, summer).

(2006/07) Charles University in Prague, Faculty of Mathematics and Physics: *Algorithms and Data Structures II* (TIN061, tutorials, summer), *Internet* (SWI096, tutorial, summer).

Citations

H-index: Scopus/9, Google Scholar/14, Web of Science/7

i10-index: Google Scholar/17

Prizes and Awards

(2020) Second place in FOF category at the CADE ATP System Competition (CASC) at CADE 2020.

(2019) Second place in FEQ category at the CADE ATP System Competition (CASC) at CADE 2019.

(2018) Part of the winning team in LTB category at the CADE ATP System Competition (CASC) at CADE 2018.

(2016) Best Student Paper Award [DBLP:conf/icaart/TozickaJK16] on the 8th International Conference on Agents and Artificial Intelligence (ICAART), February 2016.

(2015) Part of the winning team in Competition of Distributed Multi-Agent Planners (CoDMAP) at ICAPS 2015.

(2006) The 2006 Federated Logic Conference (FLoC-06), Seattle, USA; Our team took the 3rd place at international Prolog contest.

Language Skills

Czech (native), English (fluent)

Programming Skills

advanced knowledge: Haskell, C/C++, C#, Python, Prolog, Java.

basic knowledge: Ocaml, Perl, Lisp, ML, PHP, Javascript, SQL, Postscript, Lua, F#, sh, bash.

Work Experience

(2010 – 2012) Freelance software developer for CMMS, s.r.o. and Tesla Electron-Tubes, a.s. (C# Programmer, Embedded Linux C Programmer, Single-board Application Developer).

Selected Publications

Journals

- [1] Jan Jakub v and Cezary Kaliszyk. “Relaxed Weighted Path Order in Theorem Proving”. In: *Math. Comput. Sci.* 14.3 (2020), pp. 657–670.
- [2] Jan Jakub v and Josef Urban. “Hierarchical invention of theorem proving strategies”. In: *AI Commun.* 31.3 (2018), pp. 237–250.
- [3] Jan Toži ka, Jan Jakub v, and Antonín Komenda. “Recursive Reductions of Action Dependencies for Coordination-Based Multiagent Planning”. In: *Trans. Comput. Collect. Intell.* 28 (2018), pp. 66–92.
- [4] Jan Toži ka, Jan Jakub v, Antonín Komenda, and Michal P chou ek. “Privacy-concerned multiagent planning”. In: *Knowl. Inf. Syst.* 48.3 (2016), pp. 581–618.
- [5] Jan Toži ka, Jan Jakub v, Karel Durkota, and Antonín Komenda. “Extensibility Based Multiagent Planner with Plan Diversity Metrics”. In: *Trans. Comput. Collect. Intell.* 20 (2015), pp. 117–139.

Proceedings

- [6] Zarathustra Amadeus Goertzel, Jan Jakub v, Cezary Kaliszyk, Miroslav Olšák, Jelle Piepenbrock, and Josef Urban. “The Isabelle ENIGMA”. In: ITP. Vol. 237. LIPIcs. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2022, 16:1–16:21.
- [7] Jan H la, Jan Jakub v, Mikoláš Janota, and Lukás Kubej. “Targeted Configuration of an SMT Solver”. In: CICM. Vol. 13467. Lecture Notes in Computer Science. Springer, 2022, pp. 256–271.
- [8] Zarathustra Amadeus Goertzel, Karel Chvalovský, Jan Jakub v, Miroslav Olšák, and Josef Urban. “Fast and Slow Enigmas and Parental Guidance”. In: FroCoS. Vol. 12941. Lecture Notes in Computer Science. Springer, 2021, pp. 173–191.
- [9] Jan Jakub v, Mikoláš Janota, and Andrew Reynolds. “Characteristic Subsets of SMT-LIB Benchmarks”. In: SMT. Vol. 2908. CEUR Workshop Proceedings. CEUR-WS.org, 2021, pp. 53–63.
- [10] Karel Chvalovský, Jan Jakub v, Miroslav Olšák, and Josef Urban. “Learning Theorem Proving Components”. In: TABLEAUX. Vol. 12842. Lecture Notes in Computer Science. Springer, 2021, pp. 266–278.
- [11] Jan Jakub v, Karel Chvalovský, Miroslav Olšák, Bartosz Piotrowski, Martin Suda, and Josef Urban. “ENIGMA Anonymous: Symbol-Independent Inference Guiding Machine (System Description)”. In: IJCAR (2). Vol. 12167. Lecture Notes in Computer Science. Springer, 2020, pp. 448–463.
- [12] Josef Urban and Jan Jakub v. “First Neural Conjecturing Datasets and Experiments”. In: CICM. Vol. 12236. Lecture Notes in Computer Science. Springer, 2020, pp. 315–323.
- [13] Karel Chvalovský, Jan Jakub v, Martin Suda, and Josef Urban. “ENIGMA-NG: Efficient Neural and Gradient-Boosted Inference Guidance for E”. In: CADE. Vol. 11716. Lecture Notes in Computer Science. Springer, 2019, pp. 197–215.
- [14] Jan Jakub v and Josef Urban. “Hammering Mizar by Learning Clause Guidance (Short Paper)”. In: ITP. Vol. 141. LIPIcs. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2019, 34:1–34:8.
- [15] Zarathustra Amadeus Goertzel, Jan Jakub v, and Josef Urban. “ENIGMAWatch: ProofWatch Meets ENIGMA”. In: TABLEAUX. Vol. 11714. Lecture Notes in Computer Science. Springer, 2019, pp. 374–388.
- [16] Jan Jakub v and Cezary Kaliszyk. “Towards a Unified Ordering for Superposition-Based Automated Reasoning”. In: ICMS. Vol. 10931. Lecture Notes in Computer Science. Springer, 2018, pp. 245–254.
- [17] Zarathustra Amadeus Goertzel, Jan Jakub v, Stephan Schulz, and Josef Urban. “ProofWatch: Watchlist Guidance for Large Theories in E”. In: ITP. Vol. 10895. Lecture Notes in Computer Science. Springer, 2018, pp. 270–288.
- [18] Zarathustra Amadeus Goertzel, Jan Jakub v, and Josef Urban. “ProofWatch Meets ENIGMA: First Experiments”. In: LPAR (Workshop and Short Papers). Vol. 9. Kalpa Publications in Computing. EasyChair, 2018, pp. 15–22.

- [19] Jan Jakub v and Josef Urban. “Enhancing ENIGMA Given Clause Guidance”. In: CICM. Vol. 11006. Lecture Notes in Computer Science. Springer, 2018, pp. 118–124.
- [20] Jan Jakub v and Josef Urban. “BliStrTune: hierarchical invention of theorem proving strategies”. In: CPP. ACM, 2017, pp. 43–52.
- [21] Jan Jakub v, Martin Suda, and Josef Urban. “Automated Invention of Strategies and Term Orderings for Vampire”. In: GCAI. Vol. 50. EPiC Series in Computing. EasyChair, 2017, pp. 121–133.
- [22] Jan Jakub v and Josef Urban. “ENIGMA: Efficient Learning-Based Inference Guiding Machine”. In: CICM. Vol. 10383. Lecture Notes in Computer Science. Springer, 2017, pp. 292–302.
- [23] Jan Toži ka, Jan Jakub v, Martin Svatos, and Antonín Komenda. “Recursive Polynomial Reductions for Classical Planning”. In: ICAPS. AAAI Press, 2016, pp. 317–325.
- [24] Jan Toži ka, Jan Jakub v, and Antonín Komenda. “Recursive Reductions of Internal Dependencies in Multiagent Planning”. In: ICAART (2). SciTePress, 2016, pp. 181–191.
- [25] Jan Jakub v and Josef Urban. “Extending E Prover with Similarity Based Clause Selection Strategies”. In: CICM. Vol. 9791. Lecture Notes in Computer Science. Springer, 2016, pp. 151–156.
- [26] Jan Toži ka, Jan Jakub v, and Antonín Komenda. “From Public Plans to Global Solutions in Multiagent Planning”. In: EUMAS/AT. Vol. 9571. Lecture Notes in Computer Science. Springer, 2015, pp. 21–33.
- [27] Jan Jakub v, Jan Toži ka, and Antonín Komenda. “Multiagent Planning by Plan Set Intersection and Plan Verification”. In: ICAART (2). SciTePress, 2015, pp. 173–182.
- [28] Jan Jakub v, Jan Toži ka, and Antonín Komenda. “Using Process Calculi for Plan Verification in Multiagent Planning”. In: ICAART (Revised Selected Papers). Vol. 9494. Lecture Notes in Computer Science. Springer, 2015, pp. 245–261.
- [29] Jan Toži ka, Jan Jakub v, and Antonín Komenda. “Generating Multi-Agent Plans by Distributed Intersection of Finite State Machines”. In: ECAI. Vol. 263. Frontiers in Artificial Intelligence and Applications. IOS Press, 2014, pp. 1111–1112.
- [30] Jan Toži ka, Jan Jakub v, Karel Durkota, Antonín Komenda, and Michal P chou ek. “Multiagent Planning Supported by Plan Diversity Metrics and Landmark Actions”. In: ICAART (1). SciTePress, 2014, pp. 178–189.
- [31] Jan Jakub v and J. B. Wells. “Expressiveness of Generic Process Shape Types”. In: TGC. Vol. 6084. Lecture Notes in Computer Science. Springer, 2010, pp. 103–119.