

Michael Katz
Curriculum Vitae
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PERSONAL DETAILS

Year and place of birth: 1977, USSR
Marital status: Married + 2
Mailing Address: Hertzl st. 100/7
Nahariya, 2244513, Israel
Phone: +972-58-5940108
Electronic Mail: ctpelok@gmail.com
World Wide Web: <http://goo.gl/5p9o9t>
Google Scholar: <https://goo.gl/j00tHa>

ACADEMIC DEGREES

Ph.D. 2010, IS, Faculty of Industrial Engineering and Management, Technion, Israel.
M.Sc. 2007, IS, Faculty of Industrial Engineering and Management, Technion, Israel.
B.A. 2002, Math and Computer Science, Faculty of Mathematics, Technion, Israel.

RESEARCH INTERESTS

Autonomous systems and Artificial Intelligence (AI), general (domain independent) problem solving, AI planning and heuristic search, AI planning complexity, domain dependent problem solving, constraint satisfaction and optimization, combinatorics and graph algorithms, accessibility of optimization and combinatorial problems modeling and solving to software developers.

TEACHING EXPERIENCE

- *Introduction to Artificial Intelligence*, Technion (096210), Winter 2010 (TA)
- *Automated Planning*, Technion (096208), Spring 2008, Spring 2009 (TA)
- *Heuristic Search Algorithms Seminar*, Saarland University, Winter 2012
- *Automatic Planning*, Saarland University, Winter 2012 (TA)

PUBLICATIONS

Thesis

- M. Katz, *Implicit Abstraction Heuristics for Cost-Optimal Planning*, PhD Thesis, Faculty of Industrial Engineering and Management, Technion Israel Institute of Technology, Technion City, Haifa, Israel.
Summary published in AI Communications Journal, 2011, Volume 24, Number 4, pages 343-345.

Journal Papers

- C. Domshlak, J. Hoffmann, M. Katz*, *Red-black planning: a new systematic approach to partial delete relaxation*, Artificial Intelligence Journal (AIJ), 2015, Volume 221, pages 73114.
- C. Domshlak, M. Katz*, S. Lefler, *Landmark-Enhanced Abstraction Heuristics*, Artificial Intelligence Journal (AIJ), 2012, Volume 189, pages 48-68.
- M. Katz, C. Domshlak, *Implicit Abstraction Heuristics*, Journal of Artificial Intelligence Research (JAIR), 2010, Volume 39, pages 51-126.
- M. Katz, C. Domshlak, *Optimal Admissible Composition of Abstraction Heuristics*, Artificial Intelligence Journal (AIJ), 2010, Volume 174, pages 767-798.
- M. Katz, C. Domshlak, *New Islands of Tractability of Cost-Optimal Planning*, Journal of Artificial Intelligence Research (JAIR), 2008, Volume 32, pages 203-288.

Conference Papers

- M. Katz, V. Mirkis, *In Search of Tractability for Partial Satisfaction Planning*, 25th International Joint Conference on Artificial Intelligence (IJCAI), 2016, New York, NY, USA.
- D. Winterer, M. Wehrle, M. Katz, *Structural Symmetries for Fully Observable Nondeterministic Planning*, 25th International Joint Conference on Artificial Intelligence (IJCAI), 2016, New York, NY, USA.
- A. Shleyfman, M. Katz, M. Helmert, S. Sievers, M. Wehrle, *Heuristics and Symmetries in Classical Planning*, 29th AAAI Conference on Artificial Intelligence (AAAI), 2015, Austin, TX, USA.

*Authors are ordered alphabetically

- S. Sievers, M. Wehrle, M. Helmert, A. Shleyfman, M. Katz, *Factored symmetries for merge-and-shrink abstractions*, 29th AAAI Conference on Artificial Intelligence (AAAI), 2015, Austin, TX, USA.
- S. Sievers, M. Wehrle, M. Helmert, M. Katz, *An Empirical Case Study on Symmetry Handling in Cost-Optimal Planning as Heuristic Search*, 38th German Conference on Artificial Intelligence (KI), 2015, Dresden, Germany.
- M. Wehrle, M. Helmert, A. Shleyfman, M. Katz, *Integrating Partial Order Reduction and Symmetry Elimination for Cost-Optimal Classical Planning*, 24th International Joint Conference on Artificial Intelligence (IJCAI), 2015, Buenos Aires, Argentina.
- M. Katz, J. Hoffmann, *Red-Black Relaxed Plan Heuristics Reloaded*, The Sixth Annual Symposium on Combinatorial Search (SoCS), 2013, Leavenworth, Washington, USA.
- M. Katz, J. Hoffmann, C. Domshlak, *Red-Black Relaxed Plan Heuristics*, 27th AAAI Conference on Artificial Intelligence (AAAI), 2013, Bellevue, Washington, USA.
- M. Katz, J. Hoffmann, C. Domshlak, *Who Said we Need to Relax All Variables?*, The International Conference on Automated Planning and Scheduling (ICAPS), 2013, Rome, Italy.
- C. Domshlak, M. Katz*, A. Shleyfman, *Symmetry Breaking: Satisficing Planning and Landmark Heuristic*, The International Conference on Automated Planning and Scheduling (ICAPS), 2013, Rome, Italy.
- M. Katz, E. Keyder, *Structural Patterns Beyond Forks: Extending the Complexity Boundaries of Classical Planning*, 26th AAAI Conference on Artificial Intelligence (AAAI), 2012, Toronto, Canada.
- M. Katz, J. Hoffmann, M. Helmert, *How to Relax a Bisimulation?*, The International Conference on Automated Planning and Scheduling (ICAPS), 2012, Sao Paulo, Brazil.
- C. Domshlak, M. Katz*, A. Shleyfman, *Enhanced Symmetry Breaking in Cost-Optimal Planning as Forward Search*, The International Conference on Automated Planning and Scheduling (ICAPS), 2012, Sao Paulo, Brazil.
- E. Karpas, M. Katz*, S. Markovitch, *When Optimal is Just Not Good Enough: Learning Fast Informative Action Cost-Partitioning*, The International Conference on Automated Planning and Scheduling (ICAPS), 2011, Friburg, Germany.
- C. Domshlak, M. Katz*, S. Lefler, *When Abstractions Met Landmarks*, The International Conference on Automated Planning and Scheduling (ICAPS), 2010, Toronto, Canada.

- M. Katz, C. Domshlak, *Structural-Pattern Databases*, The International Conference on Automated Planning and Scheduling (ICAPS), 2009, Thessaloniki, Greece.
- M. Katz, C. Domshlak, *Structural Patterns Heuristics via Fork Decomposition*, The International Conference on Automated Planning and Scheduling (ICAPS), 2008, Sydney, Australia.
- M. Katz, C. Domshlak, *Optimal Additive Composition of Abstraction-based Admissible Heuristics*, The International Conference on Automated Planning and Scheduling (ICAPS), 2008, Sydney, Australia.
- M. Katz, C. Domshlak, *Structural patterns of tractable sequentially-optimal planning*, The International Conference on Automated Planning and Scheduling (ICAPS), 2007, Providence, RI.

PUBLIC PROFESSIONAL ACTIVITIES

- Publicity Chair and Video Chair at ICAPS'15.
- Co-Chair of the Workshop on Heuristics and Search for Domain-independent Planning (HSDIP) at ICAPS'11, ICAPS'13, ICAPS'14, ICAPS'15, ICAPS'16.
- Lecturer at the ICAPS 2013 Summer School.
- Member of the Program Committee of ICAPS'11, IJCAI'11, AAAI'11, ICAPS'12, CP4PS'12, HSDIP'12, ICAPS'13, IJCAI'13, ICAPS'14, ICAPS'15, IJCAI'15, ICAPS'16
- Reviewer for the AIJ, JAIR, AI Communications journals.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Association for the Advancement of Artificial Intelligence (AAAI)
- Israel Association for Artificial Intelligence (IAAI)

AWARDS AND PRIZES

- Runner-up of the Deterministic Sequential Satisficing track 2014, The Eighth International Planning Competition.
- Innovative Planner Award 2014, The Eighth International Planning Competition.
- ICAPS Best Dissertation Award 2011.
- Department Recognition Award, Intel 2007.

PROFESSIONAL EXPERIENCE

1. IBM Haifa Research Lab, Haifa, Israel
Researcher: October, 2013 - present.
 - Automated decision making for mobile analytics
2. Department of Computer Science, Saarland University, Germany
Postdoctoral Fellow: May, 2012 - September, 2013. Host: Prof. Jörg Hoffmann.
 - Delete relaxation based heuristics for satisficing planning
 - Abstraction based heuristics for cost-optimal planning
 - Project leading:
 - Development of the “Bisimulator” – abstraction based optimal planner
 - Development of the “Red-Black” – delete relaxation based satisficing planner
 - Development of the “DKS-sat” – symmetry pruning based satisficing planner
3. Institut national de recherche en informatique et en automatique (INRIA), France
Postdoctoral Fellow: September, 2011 - May, 2012. Host: Prof. Jörg Hoffmann.
 - Abstraction based heuristics for cost-optimal planning
 - Project leading:
 - Development of the “Bisimulator” – abstraction based optimal planner
 - Development of the “DKS-opt” – symmetry pruning based optimal planner
4. Faculty of Industrial Engineering and Management, Technion, Haifa
Postdoctoral Fellow: September, 2010 - August, 2011. Host: Prof. Avigdor Gal.
 - Solving schema matching and other real life problems with planning
 - Project development:
 - NisB Project: Development of the overall architecture, optimization solutions.
5. Artificial Intelligence Research Group – IE&M, Technion, Haifa
Researcher: September, 2010 - August, 2011
 - Implicit Abstraction Heuristics
 - Project leading:
 - Development of the “ForkInit” – abstraction based optimal planner
 - Development of the “IForkInit” – abstraction based optimal planner
 - Development of the “LMFork” – abstraction based optimal planner

- Development of the “ForkUniform” – abstraction based satisficing planner
6. Artificial Intelligence Research Group – IE&M, Technion, Haifa
PhD candidate: September, 2007 - August, 2010. Advisor: Prof. Carmel Domshlak.
 - Implicit Abstraction Heuristics
 - Project leading:
 - Development of the “ForkInit” – abstraction based optimal planner
 - Development of the “IForkInit” – abstraction based optimal planner
 7. Intel Development Center (IDC) — Haifa, Israel
Software Engineer: February, 2006 - September, 2007
 - Developing Online User Requirements Gathering System
 - Developing CAD tools
 8. GL urban systems planning ltd — Tel Aviv, Israel
Algorithm Developer: February, 2004 - February, 2006
 - Developing algorithms for public transportation needs.
 - Developing various applications for non-professional users.
 - Developing installers for non-professional users.