# DROR FRIED

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# SUMMARY

I am a computer scientist with a broad background in Mathematics and in Computer Science, specifically in formal verification, artificial intelligence, and algorithms. I abstract, model, and design real-world problems into mathematical models, conduct research and analysis that lead to practical algorithmic solutions and implementations in the areas of software engineering, robotic, navigation, and more.

# AREAS OF EXPERTISE

# • Software Engineering and Formal Verification

- Designing mechanisms for automatic constructions of software/hardware components from designer specifications.
- Constructing methodologies for decomposition of systems and software components for efficient modular analysis and construction.
- Devised fault-tolerant, physical-logical interplay temporal-based components for robotic motion planning environments.
- Modeled methods for relaxing inaccuracy and noise-control for use in circuits operations.
- Developed tools for model counting that improve probabilistic inference and system testing.

## • Artificial Intelligence

- Constructed models and algorithms for stochastic decision making with applications to navigation and networks systems.
- Built algorithms for multi-agent environment, that allow for better crowded navigation on various topologies.
- Solved a 20 years-old open problem on the computational-complexity of a well known problem in artificial intelligence (the Canadian Traveler Problem).
- Designed methods for automatic system identification and analysis in wireless control networks.
- Built tools for genes overlapping verification for bio-synthesis purposes.

## • Industrial Experience

- Designed algorithms in graph theory with implementation in communication networks environment for increasing packets mobility in the networks.
- Used C++ to construct, implement, and verify algorithms in networks and communication related areas.
- Built verification tools for packet monitoring and communication on mobile platforms.

## • Leadership

- Supervising a graduate research group of 10 in the area of computer verification and reasoning.
- Mentoring young researchers and students, suggesting plausible research opportunities and collaborations, serving on thesis committee.

- Designed and taught from scratch a course in Computational Complexity for advanced undergraduate and graduate students receiving *outstanding feedback*.
- Managed a team of nine Teaching Assistants, handling concerns from approximately 200 students, and managing various administrative issues.
- Experienced in presentations, public speaking, and networking in international conferences.

#### EXPERIENCE

• <b>Postdoctorate</b> , Department of Computer Science, Rice University Host: Prof. Moshe Vardi	Aug. 2013 -Present
• Lecturer, Rice University	Aug. 2017 - Dec. 2017
• Graduate Research, Ben-Gurion University of the Negev	Oct. 2008 - Jul. 2013
• Software Engineer, ECI- Telecom Ltd. Israel	Nov. 2007 - Oct. 2008
• Automation Software Engineer, Comverse Technology, Inc. Israel	Aug. 2004 - Nov. 2007
EDUCATION	
• Ph.D. in Computer Science Ben-Gurion University of the Negev, Israel <i>Theoretical Aspects of the Generalized Canadian Traveler Problem</i> Advisor: Prof. Solomon Eyal Shimony	Jun. 2013
<ul> <li>M.Sc. in Mathematics         Ben-Gurion University of the Negev, Israel         The Structure of the Quasi Ordered Sets of ℵ<sub>1</sub>-Dense Real Order Types wite         the Embeddability Relation         Advisors: Prof. Matatyahu Rubin and Prof. Uri Abraham     </li> </ul>	Nov. 2008
• B.Sc. in Mathematics and Computer Science Ben-Gurion University of the Negev, Israel	Jul. 2004

## PUBLICATIONS

- 1. Dror Fried, Axel Legay, Joël Ouaknine, Moshe Y. Vardi. *Sequential Relational Decomposition*. Accepted to the Symposium on Logic in Computer Science (LICS) 2018.
- Dror Fried, Lucas M. Tabajara, Moshe Y. Vardi. BDD-Based Boolean Functional Synthesis. In Computer Aided Verification - 28th International Conference, CAV 2016, Proceedings, Part II, pages 402-421.
- Matthew R. Maly, Morteza Lahijanian, Dror Fried, Lydia E. Kavraki, Hadas Kress-Gazit, Moshe Y. Vardi. Temporal Logic Planning for Complex Systems in Partially-Unknown Environments with Maximal Satisfaction Guarantees. IEEE Transactions on Robotics 32(3): 583-599 (2016).
- Kuldeep S. Meel, Moshe Vardi, Supratik Chakraborty, Daniel J. Fremont, Sanjit A. Seshia, Dror Fried, Alexander Ivrii, Sharad Malik. *Constrained Sampling and Counting: Universal Hashing meets SAT Solving*. In Beyond NP, Papers from the AAAI Workshop, Phoenix, Arizona, USA, February 12, 2016.
- 5. Amir Mencel, Gera Weiss, Dror Fried. On Modeling, Complexities, and Automatic Configuration of Wireless Industrial Control Networks. In IEEE International Conference on Software Science, Technology and Engineering, SWSTE 2016, pages 125-134.

- Supratik Chakraborty, Dror Fried, Kuldeep S. Meel, Moshe Y. Vardi. From Weighted to Unweighted Model Counting. In Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015: 689-695.
- Morteza Lahijanian, Shaull Almagor, Dror Fried, Lydia E. Kavraki, Moshe Y. Vardi. This Time the Robot Settles for a Cost: A Quantitative Approach to Temporal Logic Planning with Partial Satisfaction. In Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence, pages 3664-3671, 2015.
- 8. Zahy Bnaya, Ariel Felner, Dror Fried, Olga Maksin, and Eyal Solomon Shimony. *Repeated-task Canadian Traveler Problem*. AI Commun. 28(3): 453-477 (2015).
- 9. Yuval Itan, Shen-Ying Zhang, Guillaume Vogt, Avinash Abhyankar, Melina Herman, Patrick Nitschke, Dror Fried, Lluis Quintana-Murci, Laurent Abel, and Jean-Laurent Casanova. The Human Gene Connectome as a Map of Short Cuts for Morbid Allele Discovery. Proceedings of the National Academy of Sciences 110 (14), 5558-5563, 2013.
- Dror Fried, Solomon Eyal Shimony, Amit Benbassat and Cenny Wenner. Complexity of Canadian Traveler Problem Variants. Theoretical Computer Science 487: 1-16 (2013).
- 11. Zahy Bnaya, Ariel Felner, Dror Fried, Olga Maksin, and Eyal Solomon Shimony. *Repeated-task Canadian traveler problem*. In Proceeding of the Third International Symposium on Combinatorial Search (SoCS), July 2011.
- 12. Dror Fried. Theoretical Aspects of the Generalized Canadian Traveler Problem. Ph.D. dissertation, 2013.
- 13. Dror Fried. The Structure of the Quasi Ordered Sets of ℵ<sub>1</sub>-Dense Real Order Types with the Embeddability Relation. M.Sc. thesis, 2009.

#### **UNDER REVIEW/ IN PREPARATION**

- 14. Supratik Chakraborty, Dror Fried, Lucas M. Tabajara, Moshe Y. Vardi. *Functional Synthesis via Input-Output Separation*. Submitted to FMCAD 2018.
- 15. Liat Cohen, Dror Fried, Gera Weiss. On Optimality in Probabilistic Environments. Submitted to NIPS 2018.
- 16. Dror Fried, Krishna V. Palem, Anshumali Shrivastav. Inexactness of Components in Boolean Functions. To be submitted.
- 17. Gur Pines, Assaf Pines, Dror Fried, Karthik Murthy, James D. Winkler, Ryan T. Gill. *The Feasibility of Engineered Gene Overlaps.* To be submitted.

#### SKILLS

- Core Competencies: abstraction, modeling and designing, algorithms construction, theoretical and empirical analysis, research conduction, implementation, *quick comprehension of new material*.
- Programming and Software: C++, Python, Linux, Windows, Latex, Office.
- Management and Communication: group managing, mentoring, project managing, collaboration and networking, international experience.