

Curriculum Vitae: Ilya Safro

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Personal information

Born: 11/08/1974, Moscow, Russia
Marital status: Married+1
Languages: English, Hebrew, German (very simple), Russian (native)

Education

- 2007– *Argonne National Laboratory, UChicago*
Postdoctoral appointment
Host: Dr. Paul Hovland
- 2002–2007 *The Weizmann Institute of Science*
Ph.D. in Computer Science (expected June-2007)
Field of research: multilevel algorithms, approximation algorithms, combinatorial optimization problems, graph theory, iterative methods, large scale computation
Thesis: "Multilevel algorithms for combinatorial optimization problems"
Advisors: Prof. Achi Brandt, Dr. Dorit Ron
- 2000–2002 *The Weizmann Institute of Science*
M.Sc. in Computer Science
Thesis: "The minimum linear arrangement problem"
Advisors: Prof. Achi Brandt, Prof. Uriel Feige
- 1995–1998 *Ben-Gurion University of Negev*
B.Sc. in Computer Science

Research Interests

My main research interests are in the field of algorithms for large scale computations and combinatorial optimization problems, with a focus on multilevel algorithms. This research concentrates on the analysis and development of fast (usually linear time) algorithms for practical purposes (i.e., for extremely large data), analysis of the “real world” instances for various (usually NP-hard) optimization problems (like linear ordering problems, SAT, VLSI placement, graph drawing, etc.) that are strongly connected to different branches of biology, engineering, physics and other areas. In addition, I am interesting in general combinatorial optimization problems, graph theory, iterative methods, NLP techniques, complex biosystems, etc.

Teaching Experience

Teaching assistance: Linear Algebra, Probabilistic Methods in CS, Compilation, Theory of Algorithms, Discrete Mathematics

Awards

“Excellent final project”, B.Sc.
The Luta and Ludwig Heusinger Scholarship

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Employment

<i>Shopping.com, eBay Inc.</i>	Israel
Research group	2007
Research and development of new methods for textual information clustering.	
<i>Q.B.I. Enterprises</i>	Israel
Algorithms developer	1998–2002
Development and programming of biological databases; Natural language processing - Automatic discovery of new hypotheses about the relation of biological objects using the MEDLINE information; Automatic spots detection and matching problems in electrophoresis; Statistical analysis of experimental data.	
<i>The Weizmann Institute of Science</i>	Israel
Research Assistant	1998–1999
Development of tools for amino acid content analysis in organisms treated individually or pooled together to form a pattern of characteristic properties.	
<i>Gefen systems</i>	Israel
Programmer	1998–1999
Logic programming; Development of tools for automatic news classification.	
<i>Ben-Gurion University</i>	Israel
Research Assistant	1997–1998
Development of tools for fast databases analysis.	
<i>D.A. systems</i>	Israel
Programmer	1995–1996
Development of REXX interpreter.	
<i>I.D.F.</i>	Israel
Computer systems administrator	1992–1995
Administration of different multi-user computer systems.	
<i>The Weizmann Institute of Science</i>	Israel
Research Assistant	1992–1993
Development of algorithms for Numerical Analysis.	

Professional activities

Professional societies: SIAM

Referee: Information Sciences

Talks, workshops, conferences: Ben-Gurion University (Israel, 2004), Workshop on Combinatorial Scientific Computing (CERFACS, France, 2005), Workshop on Interdisciplinary Applications of Graph Theory, Combinatorics, and Algorithms (Israel, 2006), Georgia State University (Georgia, 2006), Argonne National Laboratory (USA, 2007-2008), Sandia National Laboratories (USA, 2008), University of Illinois at Urbana-Champaign (USA, 2008), SIAM Conference on Optimization (USA, 2008), Combinatorial Scientific Computing and Petascale Simulations Workshop (USA, 2008).

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Publications

1. Safro I., Segel L., "Collective stochastic versions of playable games as metaphors for complex biosystems: Team Collect Four", Complexity 8 (2003), 46-55, [download](#)
2. Safro I., "The minimum linear arrangement problem", M.Sc. Thesis, Weizmann Institute of Science, 2002.
3. Safro I., Ron D., Brandt A., "Graph Minimum Linear Arrangement by Multilevel Weighted Edge Contractions", Journal of Algorithms, vol. 60/1, pp. 24-41, 2006, [download](#)
4. Safro I., Ron D., Brandt A., "A Multilevel Algorithm for the Minimum 2-sum Problem", Journal of Graph Algorithms and Applications, vol. 10/2, 2006, [download](#)
5. Klipcan L., Safro I., Temkin B., Safro M., "Optimal growth temperature of prokaryotes correlates with class II amino acid composition", FEBS Letters, vol. 580/6, pp. 1672-1676, 2006, [download](#)
6. Safro I., Ron D., Brandt A., "Multilevel Algorithms for Linear Ordering Problems", in press, Journal of Experimental Algorithms, 2007, [download](#)
7. Safro I., "Multilevel Algorithms for Combinatorial Optimization Problems", Ph.D. Thesis, The Weizmann Institute of Science, 2007, [download](#)

In preparation

1. "Fast multilevel solver for a planar constrained quadratic minimization problems".
2. "Generalization of Algebraic Multigrid coarsening scheme".

Book chapters

1. Safro I., Ron D., Brandt A., "Fast Multilevel Algorithms for Linear Ordering Problems", "Computer algorithms: Research, Developments", Nova Science Publishers, in publication, 2007.

ArXiv publications

1. Safro I., "The minimum linear arrangement problem on proper interval graphs", arXiv, cs.DM/0608008, 2002 (submitted 2006), [download](#)
2. Benditkis S., Safro I., "Generalizations of the Hanoi Towers problem", arXiv, cs.DM/0612070, 1998 (submitted 2006), [download](#)

References

- Prof. Achi Brandt, abrandt@math.ucla.edu
Dr. Dorit Ron, dorit.ron@weizmann.ac.il
Prof. David Peleg, david.peleg@weizmann.ac.il
Dr. Leonid Brodsky, email by request