

# Curriculum Vitae: Ilya M. Safro

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## Personal information

Born:                        11/08/1974, Moscow, Russia  
Address:                    Hanassi Harishon 54/6, Rehovot 76281, Israel  
Marital status:          Married+1  
Languages:                Hebrew, English, German (very simple), Russian (native)

## Education

2007–                        *Argonne National Laboratory, UChicago*  
**Postdoctoral appointment**  
(expect to start Nov-5, 2007)  
2002–2007                *The Weizmann Institute of Science*  
**Ph.D. in Computer Science (submitted)**  
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, engeneering, physics and other areas. In addition, I am interesting in general combinatorial optimization problems, graph theory, iterative methods, NLP techniques, complex biosystems, textual information clustering, 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

- Shopping.com, eBay Inc.* Israel  
**Research group** 2007  
Research and development of new methods for textual information clustering.
- Q.B.I. Enterprises* 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.
- The Weizmann Institute of Science* 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.
- Gefen systems* Israel  
**Programmer** 1998–1999  
Logic programming; Development of tools for automatic news classification.
- Ben-Gurion University* Israel  
**Research Assistant** 1997–1998  
Development of tools for fast databases analysis.
- D.A. systems* Israel  
**Programmer** 1995–1996  
Development of REXX interpreter.
- I.D.F.* Israel  
**Computer systems administrator** 1992–1995  
Administration of different multi-user computer systems.
- The Weizmann Institute of Science* Israel  
**Research Assistant** 1992–1993  
Development of algorithms for Numerical Analysis.

## Public appearance

- "*Multiscale Algorithm for the Minimum Linear Arrangement Problem*", 11/05/2004, Ben-Gurion University, Israel.
- "*Multilevel Algorithms for Linear Ordering Problems*", 21/06/2005, Workshop on Combinatorial Scientific Computing (CSC05) at CERFACS, Toulouse, France.
- "*Multilevel Algorithms for Linear Ordering Problems*", 30/05/2006, Sixth Haifa Workshop on Interdisciplinary Applications of Graph Theory, Combinatorics, and Algorithms, Haifa, Israel.

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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. Safro I., Ron D., Brandt A., "Multilevel Algorithms for Linear Ordering Problems", accepted, Journal of Experimental Algorithmics, 2007.
6. 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](#)

## In preparation

1. "Fast multilevel solver for a planar constrained quadratic minimization problems", 2007.
2. "Generalization of Algebraic Multigrid coarsening scheme", 2007.

## 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](mailto:abrandt@math.ucla.edu)  
Dr. Dorit Ron, [dorit.ron@weizmann.ac.il](mailto:dorit.ron@weizmann.ac.il)  
Prof. David Peleg, [david.peleg@weizmann.ac.il](mailto:david.peleg@weizmann.ac.il)  
Dr. Leonid Brodskiy, by request