

Dr. Dmitry Batenkov

Contact information

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Education

2009-2014 Ph.D. in Mathematics (Direct track), Weizmann Institute of Science, Israel.
Supervisor: Professor Y.Yomdin.
Thesis title: **Algebraic Reconstruction of Geometric Models from Integral Measurements**

1999-2002 B.A. in Computer Science (Summa cum Laude), Technion, Israel.

Research interests

Inverse moment problems
Numerical Analysis
Gibbs phenomenon, jump discontinuity detection, Prony systems

Awards and Fellowships

2013 Best Student Paper Award, SAMPTA 2013.

2013 Rotschild Postdoctoral Fellowship (not accepted for family reasons)

2012 John F. Kennedy Prize for academic excellence and scientific accomplishments, awarded by Feinberg Graduate School, Weizmann Institute of Science

2011 Adams Fellowship for Doctoral Students, awarded by Israeli Academy of Sciences

2000-2002 Technion President List Excellent Student

2001-2002 Technion CS Department Excellent Students Program (SAMBA)

2001 Knesset (Israeli Parliament) Committee for Education and Culture Excellent Student

Professional experience

Academic

- 2012-2013 Teaching assistant at the Department of Mathematics, Weizmann Institute of Science, Israel.
- Analysis for High School Teachers, Fall 2012.
 - Geometry for High School Teachers, Spring 2013.
- 2009-2011 Member of Editorial Board, XRDS: ACM Student Magazine.
- 2001-2002 Teaching assistant at the Faculty of Computer Science, Technion, Israel. (Courses: Introduction to Computer Science, Logic for Computer Science.)

Software engineering

- Since 2011 iClean (<http://iclean.org.il>) - encourages people to take personal responsibility choosing a path or area they want to adopt and help keep clean.
- Since 2010 Photo-Animator (<http://photo-animator.com>) - an online tool which enables anyone to create a beautiful movie from album photos. My contribution to this project includes developing algorithms for object recognition, modelization and animation.
- 2002-2008 Software Engineer and Team Leader, Israel Defense Forces (MAM-RAM unit).
- 2001 Advanced programming projects at the Technion - Israel Institute of Technology
- TCP/IP Header Compression for Satellite Environment
 - Spatial Openness Index Calculator
 - Spread Spectrum Image Steganography

List of publications

Preprints

- [1] D. Batenkov, O. Friedland, and Y. Yomdin. Sampling, metric entropy and dimensionality reduction. *arXiv:1308.2781 [math]*, August 2013.
- [2] D. Batenkov. Decimated generalized Prony systems. *arXiv preprint arXiv:1308.0753*, 2013.
- [3] Dmitry Batenkov and Gal Binyamini. Moment vanishing of piecewise solutions of linear ODEs. *arXiv preprint arXiv:1302.0991*, 2013.
- [4] Dmitry Batenkov and Yosef Yomdin. Taylor Domination, Turán lemma, and Poincaré-Perron Sequences. *arXiv preprint arXiv:1301.6033*, 2013.

Peer-reviewed journal papers

- [5] Dmitry Batenkov. Complete algebraic reconstruction of piecewise-smooth functions from Fourier data. *Accepted for publication in Mathematics of Computation*, 2014.
- [6] Dmitry Batenkov, Niv Sarig, and Yosef Yomdin. Accuracy of algebraic fourier reconstruction for shifts of several signals. *Accepted for publication in Special Issue of STSIP*, 2014.
- [7] D. Batenkov, V. Golubyatnikov, and Y. Yomdin. Reconstruction of Planar Domains from Partial Integral Measurements. *Contemporary Mathematics*, 591:51–66, 2013.
- [8] D. Batenkov and Y. Yomdin. On the accuracy of solving confluent Prony systems. *SIAM J. Appl. Math.*, 73(1):134–154, 2013.
- [9] Dmitry Batenkov and Yosef Yomdin. Local and global geometry of Prony systems and Fourier reconstruction of piecewise-smooth functions. *To appear in Abel Symposia*, 2013.
- [10] D. Batenkov, N. Sarig, and Y. Yomdin. An “algebraic” reconstruction of piecewise-smooth functions from integral measurements. *Functional Differential Equations*, 19(1-2):13–30, 2012.
- [11] D. Batenkov and Y. Yomdin. Algebraic Fourier reconstruction of piecewise smooth functions. *Mathematics of Computation*, 81:277–318, 2012.
- [12] Dmitry Batenkov. Open BEAGLE: a generic framework for evolutionary computations. *Genetic Programming and Evolvable Machines*, pages 1–3, 2011. 10.1007/s10710-011-9135-4.

- [13] D. Batenkov. Moment inversion problem for piecewise D-finite functions. *Inverse Problems*, 25(10):105001, October 2009.

Peer-reviewed conference proceedings

- [14] D. Batenkov. Prony Systems via Decimation and Homotopy Continuation. In *SNC '14: Symbolic-Numeric Computation 2014*, 2014.
- [15] D. Batenkov, N. Sarig, and Y. Yomdin. Decoupling of Fourier Reconstruction System for Shifts of Several Signals. In *Proceedings of the 10th International Conference on Sampling Theory and Applications (SAMPTA)*, 2013. Arxiv preprint arxiv:1305.2832.
- [16] Dmitry Batenkov and Yosef Yomdin. Algebraic signal sampling, Gibbs phenomenon and Prony-type systems. In *Proceedings of the 10th International Conference on Sampling Theory and Applications (SAMPTA)*, 2013. arXiv preprint arXiv:1306.1097.
- [17] Dmitry Batenkov and Yosef Yomdin. Geometry and Singularities of the Prony mapping. *To appear in Proceedings of 12th International Workshop on Real and Complex Singularities*, 2013.
- [18] D. Batenkov, G. Dinkin, and Y. Yomdin. Automatic animation of high-resolution images. In *Proc. of IEEE 27-th Convention of Electrical and Electronics Engineers in Israel*, 2012.
- [19] D. Batenkov and Y. Yomdin. Algebraic reconstruction of piecewise-smooth functions from Fourier data. In *Proc. of Sampling Theory and Applications (SAMPTA)*, 2011.
- [20] D. Batenkov, N. Sarig, and Y. Yomdin. An “algebraic” reconstruction of piecewise-smooth functions from integral measurements. In *Proc. of Sampling Theory and Applications (SAMPTA)*, 2009.

Invited Talks

- [21] D. Batenkov. Inverse trigonometric moment problem for piecewise-smooth functions. In *Conference on Polyhedra, Lattices, Algebra, and Moments*, National University of Singapore, 2014.
- [22] D. Batenkov. Accurate Fourier reconstruction of piecewise-smooth functions. In *Research Workshop on Integral Transforms and Spectral Theory in Analysis and Geometry, Naharia, Israel*, 2013.
- [23] D. Batenkov. Algebraic reconstruction of geometric models from integral measurements. In *2nd International Workshop on Geometry and Symbolic Computations, Haifa University*, 2013.

- [24] D. Batenkov, G. Binyamini, and Y. Yomdin. P-recursive moment sequences of piecewise D-finite functions and Prony-type algebraic systems. In *18th International Conference on Difference Equations and Applications*, 2012.
- [25] D. Batenkov and Y. Yomdin. Infinitesimal Smale-Pugh problem for Abel equation and Remez-type inequality for Mellin transform of algebraic functions. In *Israeli-Polish Mathematical Meeting, Lodz, Poland*, 2011.
- [26] D. Batenkov and Y. Yomdin. Accuracy of shock determination from truncated Fourier data. In *5th International Conference "Inverse Problems: Modeling and Simulation"*, page 146, 2010.

Miscellaneous

- [27] BATENKOV, D. Hands-on introduction to genetic programming. *XRDS 17* (September 2010), 46–ff.
- [28] BATENKOV, D. Programmatic access to Wikipedia. *XRDS 17* (December 2010), 52–53.
- [29] BATENKOV, D. Real-time detection with webcam. *XRDS 16* (June 2010), 50–51.
- [30] BATENKOV, D. Analyzing EEG data. *XRDS 18* (September 2011), 36–37.
- [31] BATENKOV, D. Boosting productivity with the Boost Graph Library. *XRDS 17* (March 2011), 31–32.
- [32] BATENKOV, D. Web maps of renewable energy. *XRDS 17* (June 2011), 56–57.