DIMITRIS ACHLIOPTAS

optas@di.uoa.gr

RESEARCH INTERESTS

Algorithm Design, Random Structures, Machine Learning

EMPLOYMENT HISTORY

07/2010 – Present	Professor	University of Athens, Greece
07/2011 – 12/2019	Professor	University of California Santa Cruz
01/2019 – 12/2019	Faculty Researcher	Google Research, Mountain View CA
07/2008 – 07/2014	Researcher	Computer Technology Institute, Greece
07/2007 – 06/2011	Associate Professor	University of California Santa Cruz
05/2007 – 06/2007	Visiting Professor	CNRS, Paris
11/2005 – 06/2007	Assistant Professor	University of California Santa Cruz
2000–2005	Researcher	Microsoft Research
1999	Postdoctoral Fellow	Microsoft Research

EDUCATION

1999	Ph.D.	Computer Science, University of Toronto. Advisor: Michael Molloy. Thesis: *Threshold Phenomena in Random Graph Colouring and Satisfiability*
1995	M.Sc.	Computer Science, University of Toronto. Advisor: Derek Corneil. Thesis: *The Complexity of G-free Colorability*
1993	B.Eng.	Computer Engineering, University of Patras.

HONORS AND AWARDS

- Sloan Fellow, 2007-2013

- Kavli Fellow, 2007–2008

- Governor General's Gold Medal, Honourable mention, University of Toronto, 1999

- Best Ph.D. Thesis in Mathematical Sciences, University of Toronto, 1999

GRANTS

- 2018-2019: co-PI, *Privacy-Preserving Genomic Data Analysis*, TRIPODS+X, **NSF, $527K**

- 2017-2019: PI, *Efficient High-Dimensional Integration via Error-Correcting Codes*, **NSF, $480K**

- 2016-2017: PI, *Algorithms for Exploratory Clustering at Massive Scale*, **Adobe, $50K**

- 2015-2019: PI, *Information Compression in Algorithm Design and Statistical Physics*, **NSF, $450K**

- 2013-2015: PI, *Robust Learning on Big Data*, **Yahoo!, $20K.**

- 2008-2013: PI, *Rigorous Mathematical Connections Between the Theory of Computation and Statistical Physics*, IDEAS Starting Grant, **European Research Council, Euro 750K.**

- 2005-2010: PI, *Algorithms and Models for Random Structures*, CAREER Award, **NSF, $400K**

SCHOLARLY AND CREATIVE WORK

Edited Special Issues of Journals

SIAM Journal on Discrete Mathematics, Vol 25, 2011, eds. D. Achlioptas, C. Borgs, et al.
Special issue for Message Passing Algorithms and Constraint Satisfaction Problems.

SIAM Journal on Computing, Vol. 37, no. 1, 2007, eds. D. Achlioptas, V. Kotlun. Special issue for 45th
IEEE Conf. on Foundations of Computer Science (FOCS) (2004).

Internet Mathematics, Volume 2, no. 3, 2005, eds. D. Achlioptas, S. Leonardi. Special issue devoted to
invited papers from the 3rd Int. Workshop on Algorithms and Models for the Web Graph (2004).

Book Chapters

[1] D. Achlioptas
    Random Satisfiability
    In *Handbook of Satisfiability*, IOS Press, 243–268, 2009.

Journal Articles

[2] D. Achlioptas, P. Theodoropoulos
    Model counting with error-correcting codes
    Constraints, **24** (2), 2019, 162–182.

[3] D. Achlioptas, F. Iliopoulos, V. Kolmogorov
    A Local Lemma for Focused Stochastic Algorithms
    SIAM Journal on Computing, **48** (5), 2019, 1583–1602.

[4] D. Achlioptas, P. Siminelakis
    Symmetric graph properties have independent edges
    Information & Computation, **261**, 2018, 446–463.

[5] D. Achlioptas, F. Iliopoulos
    Random Walks That Find Perfect Objects and the Lovász Local Lemma
    Journal of the ACM, **63** (3), Article 22, 2016.

[6] D. Achlioptas, M. Molloy
    The solution space geometry of random linear equations
    Random Structures & Algorithms, **46** (2), 2015, 197–231.

[7] D. Achlioptas, A. Coja-Oghlan, F. Ricci-Tersenghi
    On the solution-space geometry of random constraint satisfaction problems
    Random Structures & Algorithms, **38** (3), 2011, 251–268.

[8] D. Achlioptas, A. Clauset, C. Moore, D. Kempe
    On the bias of traceroute sampling
    Journal of the ACM, **56** (4), Article 21 (June 2009).

[9] D. Achlioptas, R. D'Souza, J. Spencer
Explosive percolation in random networks
Science, **323**, (March 2009), 1453–1455.

[10] D. Achlioptas, F. Ricci-Tersenghi
Random formulas have frozen variables
SIAM Journal on Computing, **39** (2009), 260–280.

[11] D. Achlioptas
Solution clustering in random satisfiability.
European Physics Journal B, **64** (2008), 395–402.

[12] D. Achlioptas, F. McSherry
Fast computation of low rank matrix approximations
Journal of the ACM, **54** (2), Article 9 (April 2007).

[13] D. Achlioptas, A. Naor, Y. Peres
On the maximum satisfiability of random formulas
Journal of the ACM, **54** (2), Article 10 (April 2007).

[14] D. Achlioptas, C. Moore
Random k-SAT: two moments suffice to cross a sharp threshold
SIAM Journal on Computing, **36** (2006), 740–762.

[15] D. Achlioptas, A. Naor, Y. Peres
Rigorous location of phase transitions in hard optimization problems
Nature, **435** (2005), 759–764.

[16] D. Achlioptas, A. Naor
The two possible values of the chromatic number of a random graph
Annals of Mathematics, **162** (2005), no. 3, 1333–1349.

[17] D. Achlioptas, M. Molloy, C. Moore, F. Van Bussel
Rapid mixing for lattice colourings with fewer colours
Journal of Statistical Mechanics: Theory and Experiment, 2005, P10012.

[18] D. Achlioptas, H. Jia, C. Moore
Hiding satisfying assignments: two are better than one
Journal of Artificial Intelligence Research, **24** (2005), 623–639.

[19] D. Achlioptas, Y. Peres
The threshold for random k-SAT is $2^k \log 2 - O(k)$
Journal of the American Mathematical Society, **17** (2004), 947–973.

[20] Y.M. Wang, L. Qiu, C. Verbowski, D. Achlioptas, G. Das, P. Larson
Summary-based routing for content-based event distribution networks
Computer Communication Review, **34** (2004), no. 5, 59–74.

[21] D. Achlioptas, P. Beame, M. Molloy
A sharp threshold in proof complexity yields lower bounds for satisfiability search
Journal of Computer & System Sciences, **68** (2004), no. 2, 238–268.
Special Issue of Selected papers from STOC'01.

[22] D. Achlioptas, C. Moore
Almost all graphs with average degree 4 are 3-colorable
Journal of Computer & System Sciences, **67** (2003), no. 2, 441–471.
Special Issue of Selected papers from STOC'02.

[23] D. Achlioptas
Database-friendly random projections: Johnson-Lindenstrauss with binary coins.
Journal of Computer & System Sciences, **66** (2003), no. 4, 671–687.
Special Issue of Selected papers from PODS'01.

[24] D. Achlioptas, J.H. Kim, M. Krivelevich, P. Tetali
Two-coloring random hypergraphs
Random Structures & Algorithms, **20** (2002), no. 2, 249–259.

[25] D. Achlioptas
Lower bounds for random 3-SAT via differential equations.
Theoretical Computer Science, **265** (2001), no. 1–2, 159–185.

[26] D. Achlioptas, L. Kirousis, E. Kranakis, D. Krizanc
Rigorous results for random $(2+p)$-SAT
Theoretical Computer Science, **265** (2001), no. 1–2, 109–129.

[27] D. Achlioptas, L. Kirousis, E. Kranakis, D. Krizanc, M. Molloy, and Y. Stamatiou
Random constraint satisfaction: a more accurate picture
Constraints, **6** (2001), no. 4, 329–344.

[28] D. Achlioptas, M. Chrobak, J. Noga
Competitive analysis of randomized paging algorithms
Theoretical Computer Science, **234** (2000), no. 1–2, 203–218.

[29] D. Achlioptas, E. Friedgut
A sharp threshold for k-colorability
Random Structures & Algorithms, **14** (1999), no. 1, 63–70.

[30] D. Achlioptas, M. Molloy
Almost all graphs with $2.522\,n$ edges are not 3-colorable
Electronic Journal of Combinatorics, **6** (1999), #R29.

[31] J. Edmonds, C.K. Poon, D. Achlioptas
Tight lower bounds for st-connectivity on the NNJAG model
SIAM Journal on Computing, **28** (1999), no. 6, 2257–2284.

[32] D. Achlioptas, J.I. Brown, D. Corneil, M. Molloy
The existence of uniquely $-G$ colourable graphs
Discrete Mathematics, **179** (1998), no. 1–3, 1–11.

[33] D. Achlioptas
The complexity of *G*-free colourability.
Discrete Mathematics, **165–166** (1997), no. 1–3, 21–30.

Articles in Refereed Conference Proceedings

Conference articles overlapping with journal articles are cited as (Xc), where [X] is the journal article.

[34] D Achlioptas, T. Gouleakis, F. Iliopoulos
Simple Local Computation Algorithms for the General Lovász Local Lemma
In *32nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA '20)*, 1–10.

[35] D. Achlioptas, F. Iliopoulos, A. Sinclair
Beyond the Lovász Local Lemma: Point to Set Correlations and Their Algorithmic Applications
60th IEEE Annual Symposium on Foundations of Computer Science, (FOCS '19), 725–744.

[36] D. Achlioptas, Z. Hammoudeh, P. Theodoropoulos
Fast and Flexible Probabilistic Model Counting
In *21st Int. Conf. on Theory and Applications of Satisfiability Testing (SAT '18)*, pp. 148–164.

[37] D. Achlioptas, Z. Hammoudeh, P. Theodoropoulos
Fast Sampling of Perfectly Uniform Satisfying Assignments
In *21st Int. Conf. on Theory and Applications of Satisfiability Testing (SAT '18)*, pp. 135-147.

[38] D. Achlioptas, F. Iliopoulos, N. Vlassis
Stochastic Control via Entropy Compression
In *44th Int. Coll. on Automata, Languages, and Programming (ICALP '17)*, pp. 1-13.

[39] A. Gittens, D. Achlioptas, M. W. Mahoney
Skip-Gram - Zipf + Uniform = Vector Additivity
In *55th Ann. Meet. of the Association for Computational Linguistics (ACL '17)*, pp. 69-76.

[40] D. Achlioptas, S. H. Hassani, W. Liu, R. L. Urbanke
Time-invariant LDPC convolutional codes
In *2017 Int. Symp. on Information Theory (ISIT '17)*, pp. 366-370.

(2c) D. Achlioptas, P. Theodoropoulos
Probabilistic Model Counting with Short XORs
In *20th Int. Conf. on Theory and Applications of Satisfiability Testing (SAT '17)*, pp. 3-19.

[41] D. Achlioptas, F. Iliopoulos
Focused stochastic local search and the Lovász local lemma
In *27th Ann. Symp. on Discrete Algorithms (SODA '16)*, pp. 2024–2038.

[42] D. Achlioptas, S.H. Hassani, N. Macris, R.L. Urbanke
Bounds for random constraint satisfaction problems via spatial coupling
In *27th Ann. Symp. on Discrete Algorithms (SODA '16)*, pp. 469–479.

(4c) D. Achlioptas, P. Siminelakis
Symmetric graph properties have independent edges
In *42nd Int. Coll. on Automata, Languages, and Programming (ICALP '15)*, pp. 467–478.

[43] D. Achlioptas, P. Jiang
Stochastic integration via error-correcting codes
In *31st Conf. on Uncertainty in Artificial Intelligence (UAI '15)*, pp. 22–31.

[44] D. Achlioptas, P. Siminelakis
Navigability is a robust property
In *12th Int. Work. on Algorithms and Models for the Web Graph (WAW '15)*, pp. 78–91.

(5c) D. Achlioptas, F. Iliopoulos
Random walks that find perfect objects and the Lovász local lemma
In *55th Ann. Symp. on Foundations of Computer Science (FOCS '14)*, pp. 494–503.

[45] D. Skourtis, D. Achlioptas, N. Watkins, C. Maltzahn, S. Brandt
Erasure coding and read/write separation in flash storage
In *2nd Work. on Interactions of NVM/Flash with OS and Workloads (INFLOW '14)*.

[46] D. Skourtis, D. Achlioptas, N. Watkins, C. Maltzahn, S. Brandt
Flash on rails: Consistent flash performance through redundancy
In *2014 USENIX Ann. Technical Conf. (USENIX ATC '14)*, pp. 463–474.

[47] D. Achlioptas, Z. Karnin, E. Liberty
Near-optimal distributions for data matrix sampling
In *Neural Information Processing Systems (NIPS '13)*, pp. 1565–1573.

[48] D. Skourtis, D. Achlioptas, C. Maltzahn, S. Brandt
High performance and low latency in solid-state drives through redundancy
In *1st Work. on Interactions of NVM/Flash with OS and Workloads (INFLOW '13)*.

[49] D. Achlioptas, T. Gouleakis
Algorithmic improvements of the Lovász local lemma via cluster expansion
In *32nd Ann. Conf. on Found. of Software Tech. and Theor. Comp. Sci. (FSTTCS '12)*.

[50] D. Achlioptas, R. Menchaca-Mendez
Unsatisfiability bounds for random CSPs from an energetic interpolation method
In *39th Int. Coll. on Automata, Languages, and Programming (ICALP '12)*, pp. 1–12.

[51] D. Achlioptas, R. Menchaca-Mendez
Exponential lower bounds for DPLL algorithms on satisfiable random 3-CNF formulas
In *39th Int. Conf. on Satisfiability Testing (SAT '12)*, pp. 327–340.

[52] D. Achlioptas, A. Coja-Oghlan
Algorithmic barriers from phase transitions
In *49th Ann. Symp. on Foundations of Computer Science (FOCS '08)*, pp. 793–802.
Invited to conference special issue, invitation declined.

(7c) D. Achlioptas, F. Ricci-Tersenghi
      On the solution-space geometry of random constraint satisfaction problems
      In *38th Ann. Symp. on Theory of Computing (STOC '06)*, pp. 130–139.

[53] D. Achlioptas, F. McSherry
      On spectral learning of mixtures of distributions
      In *18th Ann. Conf. on Computational Learning Theory (COLT '05)*, pp. 458–469.

(8c) D. Achlioptas, A. Clauset, C. Moore, D. Kempe
      On the bias of traceroute sampling
      In *37th Ann. Symp. on Theory of Computing (STOC '05)*, pp. 694–703.

[54] D. Achlioptas
      Random matrices in data analysis.
      In Proc. of *15th European Conf. on Machine Learing (ECML '04)*, pp. 1–8.
      Invited Article.

[55] D. Achlioptas, C. Moore
      The chromatic number of random regular graphs
      In Proc. of *8th Int. Workshop on Random. and Approx. Tech. (RANDOM '04)*, pp. 219–228.

(18c) D. Achlioptas, C. Moore, H. Jia
       Hiding satisfying assignments: two are better than one
       In Proc. of *21st National Conf. on Artificial Intelligence (AAAI '04)*, pp. 131–136.

(16c) D. Achlioptas, A. Naor
       The two possible values of the chromatic number of a random graph
       In Proc. of *36th Ann. Symp. on Theory of Computing (STOC '04)*, pp. 587–593.

(17c) D. Achlioptas, M. Molloy, C. Moore, F. Van Bussel
       Sampling grid colorings with fewer colors
       In Proc. of *6th Latin American Theoretical Informatics Symposium (LATIN '04)*, pp. 80–89.

[56] D. Achlioptas, P. Beame, M. Molloy
      Exponential lower bounds for DPLL below the satisfiability threshold
      In Proc. of *15th Ann. Symp. on Discrete Algorithms (SODA '04)*, pp. 132–133.

(13c) D. Achlioptas, A. Naor, Y. Peres
       On the maximum satisfiability of random formulas
       In Proc. of *44th Ann. Symp. on Foundations of Computer Science (FOCS '03)*, pp. 362–370.

(19c) D. Achlioptas, Y. Peres
       The threshold for random k-SAT is $2^k \ln 2 - O(k)$
       In Proc. of *35th Ann. Symp. on Theory of Computing (STOC '03)*, pp. 223–231.

(14c) D. Achlioptas, C. Moore
       The asymptotic order of the random k-SAT threshold
       In Proc. of *43th Ann. Symp. on Foundations of Computer Science (FOCS '02)*, pp. 779-788.

[57] D. Achlioptas, C. Moore
On the 2-colorability of random hypergraphs
In Proc. of *6th Int. Workshop on Random. and Approx. Tech. (RANDOM '02)*, pp. 78–90.

(22c) D. Achlioptas, C. Moore
Almost all graphs with degree 4 are 3-colorable
In Proc. of *34th Ann. Symp. on Theory of Computing (STOC '02)*, pp. 199–208.

[58] D. Achlioptas, F. McSherry, B. Schölkopf
Sampling techniques for kernel methods
In *Advances in Neural Information Processing Systems (NIPS '01)*, **14**, MIT Press, 2002.

[59] D. Achlioptas, A. Fiat, A. Karlin, F. McSherry
Web search via hub synthesis
In Proc. of *42nd Ann. Symp. on Foundations of Computer Science (FOCS '01)*, pp. 500–509.

(12c) D. Achlioptas, F. McSherry
Fast Computation of Low Rank Matrix Approximations
In Proc. of *33rd Ann. Symp. on Theory of Computing (STOC '01)*, pp. 611–618.

(21c) D. Achlioptas, P. Beame, M. Molloy
A sharp threshold in proof complexity
In Proc. of *33rd Ann. Symp. on Theory of Computing (STOC '01)*, pp. 337–346.

(23c) D. Achlioptas
Database-friendly random projections.
In Proc. of *20th Ann. Symp. on Principles of Database Systems (PODS '01)*, pp. 274–281.

[60] H. Kautz, Y. Ruan, D. Achlioptas, C. Gomes, B. Selman, M. Stickel
Balance and filtering in structured satisfiable problems
In Proc. of *17th Int. Joint Conf. on Artificial Intelligence (IJCAI '01)*, pp. 351–358.

[61] D. Achlioptas, A. Chtcherba, G. Istrate, and C. Moore
The Phase Transition in NAESAT and 1-in-k SAT
In Proc. of *12th Ann. Symp. on Discrete Algorithms (SODA '01)*, pp. 721–722.

[62] D. Achlioptas, C. Gomes, H. Kautz, and B. Selman
Generating Satisfiable Problem Instances
In Proc. of *17th National Conf. on Artificial Intelligence (AAAI '00)*, pp. 256–261.

[63] D. Achlioptas, G.B. Sorkin
Optimal myopic algorithms for random 3-SAT
In Proc. of *41st Ann. Symp. on Foundations of Computer Science (FOCS '00)*, pp. 590–600.

(24c) D. Achlioptas, J.H. Kim, M. Krivelevich, P. Tetali
Two-coloring random hypergraphs
In Proc. of *4th Int. Work. on Rand. and Approx. Tech. (RANDOM '00)*, pp. 85–96.

[64] D. Achlioptas
Setting two variables at a time yields a new lower bound for random 3-SAT.
In Proc. of *32nd Ann. Symp. on Theory of Computing (STOC '00)*, pp. 28–37.

[65] D. Achlioptas, M. Molloy
      The analysis of a list-coloring algorithm on a random graph
      In Proc. of *38th Ann. Symp. on Foundations of Computer Science (FOCS '97)*, pp. 204–212.

(27c) D. Achlioptas, L. Kirousis, E. Kranakis, D. Krizanc, M. Molloy, Y. Stamatiou
       Random constraint satisfaction: a more accurate picture
       In Proc. of *3rd Int. Conf. on Princ. of Constr. Prog. (CP '97)*, pp. 107–120.

(28c) D. Achlioptas, M. Chrobak and J. Noga
       Competitive analysis of randomized paging algorithms
       In Proc. of *4th European Symp. on Algorithms (ESA '96)*, pp. 419–430.

Issued Patents (US Patent Office)

9,367,850 D. Achlioptas   June 2016
           Smart button

9,158,774 D. Achlioptas   October 2015
           Interpersonal spacetime interaction system

8,244,240 D. Achlioptas, J. Krumm, E. Horvitz   August 2012
           Queries as data for revising and extending a sensor-based location service

7,693,071 D. Achlioptas, E. Tribble, M. Pearson, L. Warman   April 2010
           System and method for routing messages within a messaging system

7,693,050 D. Achlioptas, S. House   April 2010
           Stateless, affinity-preserving load balancing

7,668,957 D. Achlioptas, F. McSherry   February 2010
           Partitioning social networks

7,529,683 E. Horvitz, D. Achlioptas   May 2009
           Principals and methods for balancing the timeliness of communications and
           information delivery with the expected cost of interruption via deferral policies

7,472,110 D. Achlioptas   December 2008
           System and method for employing social networks for information discovery

7,464,075 F. McSherry, D. Achlioptas   December 2008
           Personalization of web page search rankings

7,337,443 G. Hunt, R. Welland, D. Achlioptas   February 2008
           Method and Apparatus for Processing Program Threads

7,260,611 L. Lamport, D. Achlioptas, A. Hydrie   August 2007
           Multi-Leader Distributed System

7,200,675 Y.M. Wang, L. Qiu, C.E. Verbowski, D. Achlioptas, G. Das, P.A. Larson   April 2007
           Summary-based routing for content-based event distribution networks

7,043,514 D. Achlioptas   May 2006
           System and method adapted to facilitate dimensional transform

6,996,805 D. Achlioptas, C. Borgs, J. Chayes, H. Robinson, J. Tierney   February 2006
           Methods and systems of testing software, and methods and systems of modeling user behavior

6,807,536 D. Achlioptas, F. McSherry   October 2004
           Methods and systems for computing singular value decompositions of matrices and low rank
           approximations of matrices

6,735,589 P. Bradley, D. Achlioptas, C. Faloutsos, U. Fayyad   May 2004
           Method of reducing dimensionality of a set of attributes used to characterize a sparse data set

OUTSIDE PROFESSIONAL ACTIVITY

Invited Talks at Conferences

• Invited Lecture Series: *Random Graphs and Probabilistic Methods*, Fields Institute,
Toronto, Canada, June 5– June 9, 2017.

• Keynote Speaker: *International Conference on Theory and Applications of Satisfiability Testing (SAT '15)*,
Austin, Texas, September 20–24, 2015.

• Invited Speaker: *EPSRC Symposium on Statistical Mechanics: Phase transitions in discrete structures
and computational problems*, Warwick, United Kingdom, May 5-9 2014.

• Plenary Speaker: *Foundations of Software Technology and Theoretical Computer Science (FSTTCS '12)*,
Hyderabad, India, December 10-14, 2012.

• Plenary Speaker: *Computational Learning Theory (COLT '12)*, Edinburgh, UK, June 25-27, 2012.

• Invited Speaker: Conference on Algebraic and Probabilistic Aspects of Combinatorics and Computing,
International Congress of Mathematicians (ICM'10), Bangalore, India, August 30-September 3, 2010.

• Invited Speaker: Meeting on Statistical Physics and Computer Science,
International Conference on Statistical Physics (STATPHYS 24), Beijing, China, July 7-11, 2010.

• Plenary Speaker: *Graph Theoretic Concepts in Comp. Sci. (WG 2010)*, Zaros, Greece, June 28-30, 2010.

• Tutorial Speaker: *Information Theory and Applications (ITA)*, San Diego, January 31-February 5, 2010.

• Invited Speaker: *Athens Colloquium on Algorithms and Complexity*, Athens, Greece, August 25-26, 2008.

• Invited Speaker: *Joint US-Japan Nat. Acad. of Sciences Meeting*, Tokyo, Japan, November 29–30, 2007.

• Invited Speaker: *Random Structures & Algorithms (RSA 2007)*, Tel Aviv, Israel, May 28–30, 2007.

• Invited Speaker: *Int. Conf. on Statistical Physics (STATPHYS 23)*, Genova, Italy, July 9–13, 2007.

• Invited Speaker: *British Colloquium for Theoretical Computer Science*, Oxford, UK, April 2–5, 2007.

• Invited Speaker: Section on Probability and Statistical Physics, *American Mathematical Society Meeting*,
San Francisco, April 29–30, 2006.

• Invited Lecturer: *American Mathematical Society Meeting*, Atlanta, Georgia, January 5–8, 2005.

• Keynote Speaker: *European Conference on Machine Learning*, Pisa, Italy, September 20–24, 2004.

• Invited Lecture Series: *Int. Machine Learning Summer School*, Berder, France, September 13-17, 2004.

• Invited Speaker: Conference on Glassy States of Matter and Nonequilibrium Quantum Dynamics,
Kavli Institute for Theoretical Physics, Santa Barbara, May 19–23, 2003.

Invited Presentations at Workshops

- Coding Theory for Inference, Learning and Optimization
Schloss Dagstuhl, Germany, March 11–16, 2018.

- Probabilistic Methods in the Design and Analysis of Algorithms
Schloss Dagstuhl, Germany, April 2–7, 2017.

- Information Theory and Applications (ITA)
UC San Diego, San Diego, CA, February 12–17, 2017.

- Statistical Mechanics & Machine Learning
UC Berkeley, Berkeley, CA, January 12–13, 2017.

- Uncertainty in Computation
Simons Institute for Theoretical Computer Science, Berkeley, CA, October 4–7, 2016.

- Phase transitions in discrete structures
Johann Wolfgang Goethe University, Frankfurt, Germany, July 25-29, 2016.

- Algorithms for Modern Massive Data Sets (MMDS)
UC Berkeley, Berkeley, CA, June 21-24, 2016.

- Random Instances and Phase Transitions
Simons Institute for Theoretical Computer Science, Berkeley, CA, May 2-6, 2016.

- Information Theory and Applications (ITA)
UC San Diego, San Diego, CA, Januray 31-February 5, 2016.

- Connections Between Algorithm Design and Complexity Theory
Simons Institute for Theoretical Computer Science, Berkeley, CA, September 28–October 1, 2015.

- Strategic Behavior And Phase Transitions In Random And Complex Combinatorial Structures
Centre de Recerca Matemática (CRM), Barcelona, Spain, June 8-12, 2015.

- Graphical Models, Statistical Inference, and Algorithms
Institute for Mathematics and its Applications (IMA), Minneapolis, MN, May 18-22, 2015.

- Theory and Practice of SAT Solving
Schloss Dagstuhl, Germany, April 19–24, 2015.

- Probability, Combinatorics And Geometry
McGill University's Bellairs Institute, Holetown, Barbados, April 3-10, 2015.

- Information Theory and Applications (ITA)
UC San Diego, San Diego, CA, February 2-6, 2015.

- Discrete Random Geometry
Chalmers University, Varbergs, Sweden, August 18-22, 2013.

- Modeling Intractability
Tel-Aviv University, Mitzpe Ramon, Israel, February 9-12, 2013.

- Graphical Models and Message-Passing Algorithms
Institute For Pure and Applied Mathematics (IPAM), Los Angeles, CA January 23-27, 2012.

- Pseudorandomness in Mathematical Structures
Institute for Advanced Studies, Princeton, June 14-18, 2010.

- Probabilistic Techniques in Computer Science
Centre de Recerca Matemàtica (CRM), Barcelona, Spain, September 14-18, 2009.

- Complexity and Cryptography: Status of Impagliazzo's Worlds
Institute for Advanced Studies, Princeton, June 3-5, 2009.

- Combinatorics, Randomization, Algorithms and Probability
Centre de Recherches Mathématiques (CRM), Montreal, Canada, May 4-8, 2009.

- Message-Passing Algorithms
DIMACS, Piscataway, New Jersey, October 13–17, 2008.

- Phase Transitions, Hard Comb. Problems and Message Passing Algorithms
Banff International Research Station, Banff, Canada, June 8–13, 2008.

- Design and Analysis of Algorithms on Problems in Discrete Probability
Schloss Dagstuhl, Germany, May 11–16, 2008.

- Maryland Workshop on Satisfiability
Department of Defense, Baltimore, March 3-4, 2008.

- New Directions in Complex Systems
Istanbul Technical University, Istanbul, Turkey, September 3–8, 2006.

- Algorithms for Modern Massive Data Sets (MMDS)
Stanford University, Palo Alto, June 21–24, 2006.

- Mathematical Aspects of Quantum Adiabatic Approximation
Perimeter Institute, Waterloo, Ontario, Canada, February 9 – 11, 2006.

- Phase Transitions in Computation and Reconstruction
Mathematical Sciences Research Institute, Berkeley, March 7–11, 2005.

- Problems in Discrete Probability
Banff International Research Station, Banff, Canada, July 12–26, 2003.

- Random(ized) Graphs and Algorithms
Random Graphs 2003, Bertinoro, Italy, June 15–20, 2003.

- Data Analysis and Optimization
Institute for Mathematics and its Applications, Minneapolis, Minnesota, May 6-9, 2003.

• Phase Transitions and Algorithmic Complexity
Institute for Pure and Applied Mathematics, Los Angeles, California, June 3–5, 2002.

• Computational Complexity and Statistical Physics,
Santa Fe Institute, Santa Fe, New Mexico, September 4–6, 2001.

• Intractability in Combinatorial Optimization and Counting
Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, June 5–7, 2000.

• Probabilistic Graph Theory
Fields Institute, Toronto, Canada, February 14–19, 2000.

• Probabilistic Analysis of Algorithms for Hard Problems
DIMACS, Piscataway, New Jersey, November 1–3, 1999.

Recent Colloquia and Invited Seminars

2016
Massachusetts Institute of Technology, Theory of Computation Colloquium, March 29, 2016.

2015
Institute for Advanced Studies, Princeton, Discrete Mathematics Seminar, March 23, 2015.
Institute for Advanced Studies, Princeton, Computer Science Seminar, March 24, 2015.
Stanford University, Theory Seminar, January 21, 2015.

2014
UC Berkeley, Computer Science Theory Lunch Seminar, April 30th, 2014.
Princeton University, Operations Research & Financial Engineering Colloquium, March 24, 2014.

2013
Cornell University, Special joint Algorithms and Probability Seminar, August 28, 2013.
Yahoo! Research, Seminar Series, New York, August 26, 2013.

2012
École Polytechnique Fédérale de Lausanne, Algorithms Seminar, Laussane, Switzerland, Dec. 5, 2012.
Facebook, Seminar Series Speaker, Palo Alto, June 7, 2012.

Consulting

Xevo Inc., Consulting Researcher, June 2017 – Present.

Ebay Research Labs, Consulting Researcher, October 2013 – January 2015.

Symform Inc., Technical Advisory Board, October 2011 – August 2013.

Editorial Boards

Letters of Computer Society, IEEE. 2018 – present
Computer Science Review, Elsevier. 2006 – present
Journal on Boolean Modeling, Reasoning and Computation, Elsevier. 2005 – Present.

Organizer

– Workshop on Strategic Behavior and Phase Transitions in Random and Complex Combinatorial Structures, *Centre de Recerca Matemática* (CRM), Spain, June 8-12, 2015 (with J. Díaz, L. Kirousis, and M. Serna).

– Quarter-long Research Program on Algorithmic Perspective in Economics and Physics, *Centre de Recerca Matemática* (CRM), Spain, April–June, 2015 (with J. Díaz, L. Kirousis, and M. Serna).

– Workshop on Satisfiability Solvers in Program Verification, *Federated Logic Conferences* (FLoC), August 10–11, 2006 (with B. Cook, M. Vardi).

– Minisymposium on Random Constraint Satisfaction Problems, *SIAM Conference on Discrete Mathematics* (SIAM DM), June 25-28, 2006.

– Workshop on Phase Transitions in Computation and Reconstruction, *Mathematical Sciences Research Institute* (MSRI), March 7–11, 2005 (with E. Mossel, Y. Peres).

– Workshop on Phase Transitions and Algorithmic Complexity, *Institute for Pure and Applied Mathematics* (IPAM), June 3–5, 2002 (with A. Percus, B. Bollobás, C. Borgs, J. Chayes, B. Selman).

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Conference Program Committees

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– 23rd International Conference on Randomization and Computation (RANDOM'2019)   **PC Chair**

– 50th Ann. ACM Symposium on the Theory of Computing (STOC), 2018.

– 12th Latin American Theoretical Informatics Symposium (LATIN), 2016.

– 19th Int. Work. on Randomization and Computation (RANDOM), 2015.

– 41st Int. Colloq. on Automata, Languages and Programming (ICALP), 2014.

– 1st Int. Conf. on Advances in Computing and Systems (ICACS), 2013.

– 10th Int. Workshop on Algorithms and Models for the Web Graph (WAW), 2013.

– 1st Intl. Work. on Communication Networks, Complex Systems and Statistical Physics (NETSTAT), 2013.

– 19th Int. Colloq. on Structural Information and Communication Complexity (SIROCCO), 2012.

– 15th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2012.

– 8th Int. Workshop on Algorithms and Models for the Web Graph (WAW), 2011.

– 6th Biannual European Conference on Combinatorics (EUROCOMB), 2011.

– 37th Int. Colloq. on Automata, Languages and Programming (ICALP), 2010.

– 13th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2010.

– 14th Int. Work. on Randomization and Approximation in Computer Science (RANDOM), 2010.

– 12th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2009.

– Area Chair, European Conf. on Machine Learning (ECML), 2008.

– 48th Ann. IEEE Symp. on Foundations of Computer Science (FOCS), 2007.

– 4th Sym. on Stochastic Algorithms, Foundations, and Applications (SAGA), 2007.

– 17th Ann. ACM-SIAM Symp. on Discrete Algorithms (SODA), 2006.

– 10th Int. Work. on Randomization and Approximation in Computer Science (RANDOM), 2006.

– 9th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2006.

– 2nd Int. Conf. on Combinatorial & Algorithmic Aspects of Networking and the Intenet, 2005.

– 5th Int. Conf. on Data Mining (ICDM), 2005.

– 13th Ann. European Symposium on Algorithms (ESA), 2005.

– 8th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2005.

– 45th Ann. IEEE Symp. on Foundations of Computer Science (FOCS), 2004.

– 3rd Workshop on Algorithms and Models for the Web-Graph (WAW), 2004.

– 14th Ann. ACM-SIAM Symp. on Discrete Algorithms (SODA), 2003.

– 6th Int. Work. on Randomization and Approximation in Computer Science (RANDOM), 2002.

– 5th. IEEE Int. Conf. on Data Mining (ICDM), 2002.

– 18th Nat. Conf. on Artificial Intelligence (AAAI), 2002.

– 5th Int. Symp. on the Theory and Applications of Satisfiability Testing (SAT), 2002.

– 18th. Int. Conf. on Machine Learning (ICML), 2001.

Selected Grant Reviewing

National Science Foundation (NSF)
European Research Council (ERC)
United States-Israel Binational Science Foundation (BSF)
Israel Science Foundation (ISF)
National Science and Engineering Research Council (NSERC)
Engineering and Physical Sciences Research Council (EPSRC)

Selected Journal Refereeing

Nature, Science, PNAS, Communications of the ACM, Communications in Mathematical Physics, Journal of the ACM, Journal of the AMS, SIAM Journal on Computing, Random Structures & Algorithms.