

Curriculum Vitae - Avishay Tal (2017)

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|----------------------------|---|---------------------------|
| RESEARCH INTERESTS | Computational Complexity, Analysis of Boolean Functions, Circuit Complexity, Formula Complexity, Decision Tree Complexity, Pseudorandomness, Learning, and the Connections between Algorithms and Lower Bounds. | |
| EDUCATION | Ph.D. in Computer Science <i>The Weizmann Institute of Science, Rehovot, Israel</i> Dissertation title: Analysis of Boolean Functions in Theoretical Computer Science. Advisor: Prof. Ran Raz | 2012-2015 |
| | M.Sc. (summa cum laude) in Computer Science <i>The Technion, Haifa, Israel</i> Thesis: On the Minimal Fourier Degree of Symmetric Boolean Functions Advisor: Prof. Amir Shpilka | 2007-2012 |
| | B.Sc. (summa cum laude) in Software Engineering B.A. (summa cum laude) in Mathematics <i>The Technion, Haifa, Israel</i> | 2001-2005 2001-2007 |
| EXPERIENCE | Motwani Postdoctoral Fellow <i>Stanford University, Stanford, CA.</i> <i>Hosted by Prof. Omer Reingold.</i> | 2017-current |
| | Postdoctoral Researcher <i>Institute for Advanced Study, Princeton, NJ.</i> <i>Simons Collaboration on Algorithms and Geometry.</i> | 2015-2017 |
| | Algorithmic Research Officer & Team Leader <i>IDF</i> | 2005-2012 |
| | Teaching Assistant for <i>Digital Systems</i> <i>The Technion, Haifa, Israel.</i> | 2005 |
| | Teaching Assistant for <i>Introduction to Computer Science</i> <i>The Technion, Haifa, Israel.</i> | 2003-2004 |
| AWARDS & HONORS | Postdoctoral Awards and Honors <ul style="list-style-type: none">Rothschild Postdoctoral Fellowship (withdrew) | 2015 |
| | Ph.D. Awards and Honors <ul style="list-style-type: none">Dimitris N. Chorafas PrizeThalheimer Scholarship for graduate students by the <i>Wolf Foundation</i>Adams Fellowship by the <i>Israeli Academy of Sciences and Humanities</i> | 2016 2014 2013-2015 |

- **ITCS Best Student Paper** 2013
for “*Properties and Applications of Boolean Function Composition*”

Undergraduate Awards and Honors

- Special Excellence Award from The Israeli Knesset (Parliament) 2005
- 2 SAMBA Scholarships for excellent undergraduate students in the Computer Science Department at The Technion 2003-2005
- 7 Technion President’s Excellence Awards 2001-2005

SERVICE

Conference Refereeing: STOC 2014, FOCS 2015, STACS 2015, STOC 2016, CCC 2016, ICALP 2016, SODA 2017, ITCS 2017, STOC 2017, CCC 2017, FOCS 2017

Journal Refereeing: Theory of Computing, SIAM Journal on Computing, ACM Transactions on Algorithms, and Computational Complexity

Grant Reviewing: Israel Science Foundation.

ACCEPTED / PUBLISHED PAPERS

1. **On the Minimal Fourier Degree of Symmetric Boolean Functions**
Amir Shpilka and Avishay Tal
IEEE Conference on Computational Complexity (CCC), 2011
Combinatorica, June, 2014.
2. **On the Degree of Univariate Polynomials over The Integers**
Gil Cohen, Amir Shpilka and Avishay Tal
Innovations in Theoretical Computer Science (ITCS) conference, 2012
Combinatorica, June, 2017.
3. **Properties and Applications of Boolean Function Composition**
Avishay Tal
Innovations in Theoretical Computer Science (ITCS) conference, 2013
Best Student Paper Award
4. **Improved Average-Case Lower Bounds for DeMorgan Formula Size**
Ilan Komargodski, Ran Raz and Avishay Tal
IEEE Symposium on Foundations of Computer Science (FOCS), 2013
SIAM Journal on Computing, 2017.
5. **On the Structure of Boolean Functions with Small Spectral Norm**
Amir Shpilka, Avishay Tal and Ben Lee Volk
Innovations in Theoretical Computer Science (ITCS) conference, 2014
Computational Complexity journal, 2017.
6. **Shrinkage of De Morgan Formulae by Spectral Techniques**
Avishay Tal
IEEE Symposium on Foundations of Computer Science (FOCS), 2014
7. **Two Structural Results for Low Degree Polynomials and Applications**
Gil Cohen and Avishay Tal
The 19th International Workshop on Randomization and Computation (RANDOM), 2015
8. **Matrix Rigidity of Random Toeplitz Matrices**
Oded Goldreich and Avishay Tal
The 48th Annual Symposium on the Theory of Computing (STOC), 2016
Computational Complexity journal, 2016.

9. **On Fractional Block Sensitivity**
Raghav Kulkarni and Avishay Tal
Chicago Journal of Theoretical Computer Science (CJTCS), 2016
10. **On The Sensitivity Conjecture**
Avishay Tal
The 43rd International Colloquium on Automata, Languages, and Programming (ICALP), 2016
11. **Low-Sensitivity Functions from Unambiguous Certificates**
Shalev Ben-David, Pooya Hatami and Avishay Tal
Innovations in Theoretical Computer Science (ITCS) conference, 2017
12. **Time-Space Hardness of Learning Sparse Parities**
Gillat Kol, Ran Raz and Avishay Tal
The 49th Annual Symposium on the Theory of Computing (STOC), 2017
13. **Formula Lower Bounds via the Quantum Method**
Avishay Tal
The 49th Annual Symposium on the Theory of Computing (STOC), 2017
Merge of Computing Requires Larger Formulas than Approximating and The Bipartite Formula Complexity of Inner-Product is Quadratic
(both available on ECCC).
14. **Tight Bounds on The Fourier Spectrum of AC^0**
Avishay Tal
The 32nd Computational Complexity Conference (CCC), 2017
15. **Lower Bounds for 2-Query LCCs over Large Alphabet**
Arnab Bhattacharyya, Sivakanth Gopi and Avishay Tal
The 21st International Workshop on Randomization and Computation (RANDOM), 2017

SUBMITTED PAPERS

16. **#SAT Algorithms from Shrinkage**
Avishay Tal
Available on ECCC (2015)
17. **Degree and Sensitivity: Tails of Two Distributions**
Parikshit Gopalan, Rocco A. Servedio, Avishay Tal and Avi Wigderson
Available on ECCC/Arxiv (2016)
18. **Robust Sensitivity**
Shachar Lovett, Avishay Tal and Jiapeng Zhang
Available on ECCC (2016)
19. **Pseudorandom Generators for Low-Sensitivity Functions**
Pooya Hatami and Avishay Tal
Available on ECCC (2017)
20. **Extractor-Based Time-Space Lower Bounds for Learning**
Sumegha Garg, Ran Raz and Avishay Tal
Available on ECCC/Arxiv (2017)

REFERENCES

- **Professor Irit Dinur**, Weizmann Institute
- **Professor Oded Goldreich**, Weizmann Institute
- **Professor Ran Raz**, Weizmann Institute, Princeton University
- **Professor Amir Shpilka**, Tel Aviv University
- **Professor Avi Wigderson**, Institute for Advanced Study