Omri Weinstein **Curriculum Vitæ**

CONTACT INFORMATION

Columbia University
Department of Computer Science
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PERSONAL DATA

Citizenship: Israel

PRESENT APPOINTMENT

Assistant Professor *Spring 2017 -*
Department of Computer Science, Columbia University.

AREA OF SPECIALIZATION

Computational Complexity, Communication and Information Theory, Data Structures.

EDUCATION

Courant Institute *September 2015 to December 2016*
Simons Society Junior Fellow Postdoc.
Host: Oded Regev

Princeton University *September 2010 to May 2015*
PhD in theoretical computer science
Advisor: Mark Braverman

Tel Aviv University
B.Sc in Mathematics and
Computer Science, Cum Laude *September 2006 to Febuary 2010*

FELLOWSHIPS AND AWARDS

NSF CAREER Award.

- 1844887 CAREER: Information Theoretic Methods in Data Structures. Awarded December 2018.

Columbia University's final nominee for the Packard Fellowship, 2019

The Simons Society Junior Fellowship.
https://www.simonsfoundation.org/simons-society-of-fellows/junior-fellows/

- Postdoctoral fellowship awarded for a period of 3 years starting Summer 2015 (only theoretical computer scientist out of nine awardees).

Siebel Scholarship.
http://www.siebelscholars.com/about

- Scholar of the class of 2015.

Simons-Berkeley Research Fellowship.
http://simons.berkeley.edu/

- Fellowship awarded for Spring semester 2015.

Simons Award for Graduate Students in Theoretical Computer Science.
`https://simonsfoundation.org`

- Fellowship awarded in 2013.

CSR'13 Best Paper Award

- Moscow, 2013 (Yandex award).

The Foundations of Computing graduate program Fellowship at Tel Aviv University (Awarded annually to two students).
`http://tq.cs.tau.ac.il/openings.php`

- Fellowship awarded in 2010.

Recent Preprints

- A. Golovnev, G. Posobin, O. Regev, O.Weinstein. *Polynomial Data Structure Lower Bounds in The Group Model.* (submitted). `https://eccc.weizmann.ac.il/report/2020/057/` (First super-logarithmic arithmetic data structure LB since the model was introduced in 1982.).

- S.Jiang, Z.Song, O.Weinstein, H.Zhang. *Faster Dynamic Matrix Inverse for Faster LPs.* (submitted) Arxiv: `https://arxiv.org/abs/2004.07470`. (A polynomial improvement to fastest known general LP solvers).

- Y. Kun-Ko, O.Weinstein. *An Adaptive Step Toward the Multiphase Conjecture.* (submitted) Arxiv: `https://arxiv.org/abs/1910.13543`.

- V. Lecomte, O.Weinstein. *Settling the Relationship of Wilber's Bounds for Dynamic Optimality.* (submitted) Arxiv: `https://arxiv.org/abs/1912.02858`.

Publications

- K.G. Larsen, T.Malkin, O.Weinstein, K. Yeo. *Oblivious Lower Bounds for Near Neighbor Search.* SODA'20.

- E.Viola, O.Weinstein, H.Yu. *How to Store a Random Walk.* SODA'20.

- Z.Dvir, A.Golovnev, O.Weinstein. *Data Structure Lower Bounds Imply Rigidity.* STOC'19.
(Invited extended talk at Simons Lower Bounds semester, Berkeley 2018).

- S.Shinha ,O.Weinstein. *Local Decobability of the Burrows-Wheeler Transform.* STOC'19. (Invited to Dagstuhl workshop *"25 Years of BWT"*).

- S. Assadi, X.Sun, O. Weinstein. *Massively Parallel Algorithms for Finding Well-Connected Components in Sparse Graphs.* PODC'19.

- K. Green-Larsen ,O.Weinstein, H.Yu. *Crossing the Logarithmic Barrier for Dynamic Boolean Data Structure Lower Bounds.* STOC'18
(**Invited and accepted to SICOMP special issue**)
(Invited TCS+ Talk, April 2017).

- M. Braverman, Y. Kun Ko, A.Rubinstein, O.Weinstein. *ETH Hardness for the Densest-k-Subgraph Problem with Perfect Completeness.* In SODA'17.
- A. Golovnev, O. Regev, O. Weinstein. *The Minrank of Random Graphs.* IEEE Transactions on Information Theory (Prelim. version RANDOM '17).
- T. Roughgarden, O.Weinstein. *On the Communication Complexity of Approximate Fixed Points.* FOCS'16.
- O.Weinstein, H.Yu. *Amortized Dynamic Cell Probe Lower Bounds from Four-Party Communication.* FOCS'16.
- M. Feldman, M. Tennenholtz, O.Weinstein. *Distributed Signaling Games.* Accepted for publication in ACM Journal on Economics and Computation (TEAC 2019). Preliminary version at ESA'16.
- O. Ordentlich, O. Shayevitz, O.Weinstein. *An Improved Upper Bound on the Most Informative Boolean Function Conjecture.* ISIT'16.
- N. Alon, N. Nisan, R. Raz, O.Weinstein. *Welfare Maximization with Limited Interaction.* In Proceedings of FOCS'15.
- D. Woodruff, O.Weinstein. *The Simultaneous Communication of Disjointness with Applications to Data Streams.* ICALP'15.
- O. Weinstein. *Information Complexity and the Quest for Interactive Compression.* SIGACT News Complexity Column, June 2015 issue.
- M. Braverman, O.Weinstein. *An Interactive Information Odometer with Applications.* STOC'15.
- S. Dobzinski, M.Feldman, I.Talgam-Cohen, O.Weinstein. *Welfare and Revenue Guarantees for Competitive Bundling Equilibrium.* WINE'15.
- M. Braverman, Y. Kun Ko, O.Weinstein. *Approximating the Best Nash Equilibrium in $n^{o(log n)}$-Time Breaks the Exponential Time Hypothesis.* SODA'15. (Invited TCS+ Talk, March 2014).
- D.Gavinsky, O.Meir, O. Weinstein, A.Wigderson. *Toward Better Formula Lower Bounds: An Information Complexity Approach to the KRW Composition Conjecture.* STOC'14
  (**Invited to Algorithmica special issue**, regretfully declined).
- M. Braverman, A. Rao, O. Weinstein, A. Yehudayoff. *Direct product in Communication Complexity.* FOCS'13. (Invited TCS+ Talk, February 2013.)
- M.Braverman, A.Garg, D.Pankratov, O.Weinstein. *From information to exact communication.* STOC'13.
- M. Braverman, A. Rao, O. Weinstein, A. Yehudayoff. *Direct product via round-preserving compression..* ICALP'13.
- M.Braverman, O.Weinstein. *A discrepancy lower bound for information complexity.* In proceedings of RANDOM'12 (accepted to Algorithmic, 2015).

- M.Braverman, A.Garg, D.Pankratov, O.Weinstein. *Information lower bounds via self-reducibility.* CSR'13 (**Best paper award**).
- Z.Karnin, E.Liberty, S.Lovett, R.Schwartz, O.Weinstein. *Unsupervised SVMs: On the complexity of the Furthest Hyperplane problem.* In proceedings of COLT'12.
- D.Ron, R.Rubinfeld, S.Safra, O.Weinstein. *Approximating the Influence of a Monotone Boolean function in $O(\sqrt{n})$ query complexity.* In proceedings of RANDOM'11.

Professional Activity

- Editorial board member, ACM SIGACT Theory of Computing Journal (*ToC*) *Starting date: April 2019.*
- Program Committees: FOCS'17, STOC'20 .
- FOCS'19 junior panel on *"Early career mentoring" November 2019.*
- Local co-chair 2019 Conference on Web Internet and Economics (*WINE'19*), *Columbia U, December 2019.*
- ICALP'18 Summer School on Data Structure Lower Bounds, *Prague, July 2018.*
- Invited SIGACT News Complexity Column on "Information Complexity and the Quest for Interactive Compression", *June 2015 issue.*
- Committee member of the Feder Prize in Information Theory *January 2015.*

Selected Invited Talks and Tutorials

- FOCS'19 Invited Tutorial on *"Lower Bounds via the Cell-Sampling Method". Baltimore, November 2019.*
- Invited Speaker, Theory of Data Science Program, Technion/BIU *Israel, December 2019.*
- New York Area Theory Day, Invited speaker *New York, May 2019.*
- Invited workshop on Fine Grained Approximation Algorithms and Complexity (*FG-APX*, *Bertinoro, Italy June 2019*).
- Dagstuhl workshop on Computational Complexity of Discrete Problems *Germany, March 2019.*
- NYCAC'18 symposium, invited speaker *New York City, October 2018.*
- ICALP'18 Summer School on Data Structure Lower Bounds, *Prague, July 2018.*
- IAS Theory Seminar *Crossing the Barrier for Dynamic Boolean Data Structure Lower Bounds. Institute for Advanced Studies, October 2017.*

- IAS Theory Seminar *On the Communication Complexity of Approximate Fixed Points. Institute for Advanced Studies, February 2016.*
- Barbados workshop on computational complexity in game theory, *Barbados, February 2016.*
- Invited extended talk at the Simons Institute Program on Lower Bounds in Computational Complexity, *Berkeley, October 2018.* (featuring STOC'19 paper on data structures and rigidity).
- Invited keynote speaker at China Theory Week summer school (regretfully declined), *Beijing, July 2017.*
- Invited tutorial at the 2017 Banff workshop on Communication Complexity and Applications, *Banff (CA), March 2017.*
- Invited tutorial at the Institute Henri Poincare workshop on the Nexus of Information Theory, *Paris, February 2016.*
- ISIT'15 invited tutorial on communication complexity and interactive compression (co-hosted), *Hong-Kong, June 2015.*
- Invited speaker, *IEEE Allerton Conference, September 2014.*
- Interactive Information Complexity - A Survey,
  Banff Workshop on Communication Complexity, September 2014.

Teaching

Theory of Computation — *Fall '19, Columbia University*

- (COMSE 3261)

Advanced Data Structures — *Spring '19, Columbia University*

- (COMSE 6998)

Introduction to Complexity Theory — *Fall '18, Columbia University*

- (COMSE 4236)

Information Theory In TCS — *Fall '17, Columbia University*

- (COMSE 6998-008)

Data-Structure Lower Bounds Reading Group — *Columbia University*

Advising

- Gleb Posobin (PhD, Fall 2018, joint with Rocco Servedio)
- Kevin Yeo (2019-, joint with Tal Malkin)
- Victor Lecomte (MsC, Fall 2019)
- Shunhua Jiang (PhD, Fall 2019)
- Alexandr Golovnev (Postdoc, 2017-2018)

Industrial Activity	Chief Scientist at Vast Data (vastdata.com) Enterprise SSD storage systems.	*July 2017 - July 2018*
Military Experience	*The Airforce Elite squad, IDF*	*November 2001 - May 2005*

References

Michael Saks (saks@math.rutgers.edu)

Tim Roughgarden (tr@cs.columbia.edu)

Mark Braverman (mbraverm@cs.princeton.edu)

Toni Pitassi (toni@cs.toronto.edu)

Anup Rao (anuprao@cs.washington.edu)