RYAN O'DONNELL

Curriculum vitae

February, 2021

CONTACT: odonnell@cs.cmu.edu, @BooleanAnalysis,
https://www.youtube.com/ryanodonnellteaching

CURRENT POSITION:
Professor
Computer Science Department, School of Computer Science
Carnegie Mellon University

CITIZENSHIP: Canadian, US permanent resident

RESEARCH INTERESTS:
Quantum computation and information theory
Approximability of optimization problems
Spectral graph theory
Analysis of Boolean functions
Probability
Learning theory
Complexity theory and algorithms

EDUCATION:
Ph.D., Massachusetts Institute of Technology, 1999 – 2003
Department of Applied Mathematics
Thesis: *Computational applications of noise sensitivity*
Advisor: Madhu Sudan
B.Sc., University of Toronto, 1995 – 1999
Joint Specialist degree in Mathematics and Computer Science

PROFESSIONAL EXPERIENCE:
Sabbatical visitor, University of British Columbia Comp. Sci. Dept., 2019
Professor, Carnegie Mellon Comp. Sci. Dept., 2017–present
Assoc. Professor with Tenure, Carnegie Mellon Comp. Sci. Dept., 2014–2017
Visiting Professor, Boğaziçi University Comp. Eng. Dept., 2014
Associate Professor, Carnegie Mellon Comp. Sci. Dept., 2011–2014
Member, Sch. of Mathematics, Institute for Advanced Study, 2010–2011
Assistant Professor, Carnegie Mellon Comp. Sci. Dept., 2006–2011
Lecturer (unofficial), University of Washington, fall 2005
Postdoctoral researcher, Microsoft Theory Group, 2004–2006
Postdoctoral researcher, Institute for Advanced Study, 2003–2004

PH.D. STUDENTS SUPERVISED:	Karl Wimmer:	graduated 2009	(now Duquesne University)
	Yi Wu:	graduated 2010	(now Google)
	Eric Blais	graduated 2012	(now University of Waterloo)
	Yuan Zhou:	graduated 2014	(joint w/ V. Guruswami, now UIUC)
	Aaron Roth:	2006 – 2008	(joint w/ A. Blum, now Penn)
	Ali Kemal Sinop:	2008 – 2011	(w/ V. Guruswami, now Nazarbayev)
	John Wright:	graduated 2016	(now UT Austin)
	David Witmer:	graduated 2017	(joint w/ A. Gupta, now at seminary)
	Srivatsan Narayanan:	2013	
	Sarah Allen:	2013 – 2017	(obtained Master's; now Google)
	Yu Zhao:	2014 – present	
	Costin Bădescu	2016 – present	
	Pedro Paredes	2017 – present	
	Kevin Pratt	2017 – present	
	Xinyu Wu	2019 – present	

MS THESIS STUDENTS SUPERVISED:	Corwin de Boor	2018–19
	Xinyu Wu	2018–19
	Amulya Musipatla	2020–21

BS SENIOR THESIS STUDENTS SUPERVISED:	Yongshan Ding:	2016–17 (now U. Chicago PhD program)
	Christopher Jones:	2016–17 (now U. Chicago PhD program)
	Calvin Beideman:	2017–18 (now UIUC PhD program)
	Yeongwoo Hwang:	2017–18 (w/ A. Ada, now Austin PhD prog.)
	Sidhanth Mohanty:	2017–18 (now Berkeley PhD program)
	Ramgopal Venkateswaran	2020–21

PH.D. THESIS COMMITTEES:	R. Ryan Williams:	August 2007, Carnegie Mellon University
	Per Austrin:	November 2008, Royal Inst. Tech., Sweden
	Andrew Wan	April 2010, Columbia University
	Daniel Kane	June 2011, Harvard University (Math Dept)
	Ali K. Sinop	July 2012, Carnegie Mellon University
	Dvir Falik	August 2012, Hebrew University
	Pranjal Awasthi	July 2013, Carnegie Mellon University
	Amit Weinstein	November 2013, Tel Aviv University
	Li-Yang Tan	May 2014, Columbia University
	Chenggang Wu	June 2014, Tsinghua University
	Carol Wang	August 2015, Carnegie Mellon University
	Girish Varma	December 2015, Tata Inst. of Fundamental Research

Ziling Jiang	April 2016, Carnegie Mellon University (Math Dept)
Misha Lavrov	April 2017, Carnegie Mellon University (Math Dept)
Ross Berkowitz	April 2017, Rutgers University (Math Dept)
Euiwoong Lee	May 2017, Carnegie Mellon University
Nicolas Resch	May 2020, Carnegie Mellon University
Vikesh Siddhu	July 2020, Carnegie Mellon Univ. (Physics Dept)

TEACHING:

F21:	15-459: Undergraduate Quantum Computing (5.0/4.96)
S20:	15-751: A Theorist's Toolkit (4.84/4.88)
F19:	15-455: Undergraduate Complexity Theory (4.8/4.66)
F18:	15-859BB: Quantum Computation and Information (4.96/4.75)
S18:	15-455: Undergraduate Complexity Theory (4.43/4.13)
F17:	15-855: Graduate Computational Complexity Theory (4.96/4.86)
S17:	15-455: Undergraduate Complexity Theory (4.98/4.74)
S17:	15-252: More Great ideas in Theoretical Computer Sci. (4.93/4.93)
F16:	15-859T: A Theorist's Toolkit (4.86/4.67)
S16:	15-251: Great Theoretical Ideas in Computer Sci. (4.75/4.65)
F15:	15-859BB: Quantum Computation and Information (4.85/4.77)
S15:	15-251: Great Theoretical Ideas in Computer Science (4.58/4.34)
F14:	CmpE 587: A Theorist's Toolkit (Bogaziçi University)
F13:	15-859T: A Theorist's Toolkit (4.92/4.75)
S13:	15-251: Great Theoretical Ideas in Computer Science (4.82/4.34)
F12:	15-859S / 21-801A: Analysis of Boolean Functions (4.9/4.9)
S12:	15-251: Great Theoretical Ideas in Computer Science (4.26/3.77)
F11:	15-859E: Linear and Semidefinite Programming (5.0/5.0)
S10:	15-859U: Theoretical Computer Science's Greatest Hits (4.85/4.77)
F09:	15-359: Probability and Computing (4.67/4.67)
S09:	15-855: Intensive Intro to Complexity (4.5/4.71)
F08:	15-359: Probability and Computing (4.74/4.63)
S08:	15-854B: Advanced Approximation Algorithms (4.8/4.9)
F07:	15-359: Probability and Computing (4.72/4.67)
S07:	15-859S: Analysis of Boolean Functions (4.83)
F05:	CSE 533: The PCP Theorem (University of Washington) (5.0/4.8)

GRANTS, AWARDS, AND HONORS:

US ARO Grant, Quantum Characterization of Intermed. Scale Systems
2021 – 2024, for "Scalable and Efficient Characterization of Noise for Fault-Tolerant Quantum Computation" ($400,000)

NSF Grant in Foundations of Emerging Technologies, 2019 – 2022
for "Foundations of Quantum State Learning & Testing" ($470,000)

NSF Grant in Algorithmic Foundations, 2017 – 2020
for "The Complexity of Random CSPs" ($450,000)

Herbert A. Simon Award for Teaching Excellence in Computer Science
School of Computer Science, Carnegie Mellon University, 2016
NSF Grant in Algorithmic Foundations, 2016 – 2019
for "Harmonic Analysis for Quantum Complexity" ($450,000)
EU Marie Curie International Incoming Fellowship, 2014 ($119,886)
NSF Grant in Algorithmic Foundations, 2013 – 2016
for "CSPs – Approximability versus Time" ($426,376)
BSF US-Israel Grant, 2013 – 2017, with Guy Kindler
for "Influence of Fuzzy Boolean Functions" ($97,600)
Microsoft Research–CMU Computational Thinking Grant, 2012 – 2013
for "Proof Complexity and Optimization" ($81,081)
NSF Grant in Algorithmic Foundations, 2011 – 2014
for "Analysis of Boolean Functions" ($476,388)
Microsoft Research–CMU Computational Thinking Grant, 2011 – 2012
for "Constraint Satisfaction Problems: Trichotomies" ($65,263)
Microsoft Research–CMU Computational Thinking Grant, 2010 – 2011
for "The Dichotomy Conjecture" ($62,292)
Von Neumann Fellowship (IAS School of Mathematics, 2010 – 2011)
NSF Grant in Algorithmic Foundations, 2009 – 2012, with Rocco Servedio
for "The Polynomial Method in Learning" ($299,452)
Alfred P. Sloan Research Fellowship, 2009 ($50,000)
Pazy Memorial Award, 2009 (best BSF math/CS grant) ($5000)
BSF US-Israel Grant, 2008 – 2012, with Guy Kindler
for "Fourier-Analytic Methods for Boolean Functions" ($34,000)
CyLab Grant for "Fault-Tolerant Voting", 2008 – 2009 ($75,000)
Okawa Foundation Research Grant, 2008 ($10,000)
NSF Faculty Early Career Development (CAREER) Award, 2008 – 2013
for "Optimal Approximability" ($450,313)
Best Paper Award, Conference on Computational Complexity, 2003
for the paper *Extremal properties of polynomial threshold functions*
Best Student Paper Award, Conf. on Computational Complexity, 2002
and **Best Student Paper Award, MIT Mathematics Department**, 2003
for the paper *Hardness amplification within NP*
NSERC ("Canadian NSF") Graduate Fellowship, 1999 – 2001
Rosenblith Fellowship, MIT Mathematics Department, 1999 – 2000

SERVICE AND EDITORIAL WORK:

ACM Transactions on Computation Theory,
Editor-in-Chief, 2019 – present
STOC 2020 Keynotes and Tutorials committee organizer
MSRI Scientific Advisory Board, 2018 – 2022
Computational Complexity Conference (CCC)
Board of Trustees, budget chair, 2016 – 2019

SIGACT Committee for the Advancement of Theoretical Comp. Sci., member, 2015 – present
Theory of Computing, editor, 2006 – 2019
SIAM Journal on Discrete Mathematics, editor, 2012 – 2017
Electronic Colloquium on Computational Complexity, scientific board 2009 – present
SIAM Journal of Computing, special issue editor 2005, 2010

CONFERENCE COMMITTEES:

CCC 2021, **STOC** 2021, **RANDOM** 2020, **FOCS** 2018, **CCC PC Chair** 2017, **RANDOM** 2016, **ICML** 2016, **ITCS** 2015, **CCC** 2013, **RANDOM** 2012, **SODA** 2012, **FOCS** 2010, **COLT** 2010, **CCC** 2009, **ICALP** 2008, **NeurIPS** 2008, **STOC** 2007, **STOC** 2005, **CCC** 2005

CONFERENCE ORGANIZATION:

Park City Mathematics Institute (PCMI). Co-organizer, 2023 summer graduate school on quantum computation.
Casa Matematica Oaxaca (BIRS). Co-organizer, 2021 workshop on analytic techniques in theoretical computer science.
Simons Institute. Co-organizer, 2020 workshop on Computational Phase Transitions:
Casa Matematica Oaxaca (BIRS). Co-organizer, 2018 workshop on analytic techniques in theoretical computer science.
Harvard. Co-organizer, 2017 workshop on additive combinatorics.
Simons Symposium. Co-organizer, 2016 symposium on Analysis of Boolean Functions: new directions and applications.
2015 Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), program committee member
Banff International Research Station. Co-organizer, 2014 workshop on approximation algorithms and the hardness of approximation
Simons Symposium. Co-organizer, 2014 symposium on Analysis of Boolean Functions: new directions and applications.
Simons Symposium. Co-organizer, 2012 symposium on Analysis of Boolean Functions: new directions and applications.
Banff International Research Station. Co-organizer, 2011 workshop on approximation algorithms and the hardness of approximation
Centre Emile Borel (Institute Henri Poincaré). Co-organizer, 2011 special semester on metric geometry, algorithms, groups
Center for Computational Intractability. Co-organizer, 2010 workshop on analysis and geometry of threshold functions.

REFEREEING: Annales de l'Institut Henri Poincaré; Annals of Mathematics; Annals of Probability; Combinatorica; Combinatorics, Probability and Computing; Computational Complexity; Discrete Applied Mathematics; Encyclopedia of Algorithms; European Congress of Mathematics, Information Processing Letters; Journal of the ACM; Journal of the AMS; Journal of Computer and System Sciences; Journal of Global Optimization; Journal of Machine Learning Research; Journal of Physics A: Mathematical and Theoretical; Journal of Theoretical Computer Science; Mathematics of Operations Research; SIAM Journal of Computing; SIAM Journal of Discrete Mathematics; Theory of Computing; Transactions on Information Theory. Conferences: FOCS, STOC, SODA, CCC, ICALP, COLT, NeurIPS, ICML, ITCS, RANDOM, STACS, LATIN, MFCS

GRANT REFEREEING: National Science Foundation
Israel Science Foundation
European Research Council
Swiss National Science Foundation
Natural Sciences and Engineering Research Council (NSERC Canada)

INVITED SYMPOSIUM TALKS:

Harvard/MIT Current Developments in Mathematics seminar
Invite speaker, 2021

MIT Foundations of Data Science: 2020 workshop on
Learning Under Complex Structure

TCS+: invited speaker, 2019

Simons Foundation: 2019 conference on High-Dimensional Expanders

Banff International Research Station (BIRS): 2019 workshop on
Algebraic Techniques in Computational Complexity

Simons Institute: 2018 workshop on Beyond Randomized Rounding
& The Probabilistic Method, invited speaker

Clay Mathematics Institute 20th Anniversary Conference:
invited speaker, 2018 Harmonic Analysis & Probability workshop

Clay Mathematics Institute: invited speaker,
Complexity Theory workshop, 2018

FOCS 2017 invited speaker: workshop on Frontiers in Distribution Testing

Simons Institute: invited speaker at 2017 workshop on Hierarchies,
Extended Formulations, and Matrix-Analytic Techniques

American Institute for Mathematics (AIM) Research workshop
on Random Constraint Satisfaction Problems, summer 2017

67th Midwest Theory Day: invited speaker, 2017

Schloss-Dagstuhl Seminar:
fall 2016 seminar on Algebraic Methods in Comp. Complexity

St. Petersburg Low-Depth Complexity Workshop:
invited tutorial speaker, invited speaker, 2016

NUS Workshop on Semidefinite and Matrix Methods for Optimization: invited speaker, 2016
TCS+: invited speaker, 2015
Charles River Lectures on Probability: invited speaker, 2015
Random Structures & Algorithms: invited speaker, 2015
Santa Fe Institute workshop on Algebra, Geometry, Pseudorandomness, and Complexity 2015
Magic 77 (Manuel Blum Birthday Conference): invited speaker, 2015
International Congress of Mathematicians (ICM): 2014 invited section lecturer
Swedish Summer School in Computer Science 2014**:** lecturer
Bertinoro Workshop on Sublinear Algorithms 2014
Simons Institute: 2013 workshop on real analysis in testing, learning, and inapproximability
ELC Tokyo Complexity Workshop 2013
Bellairs Institute (Barbados) Workshop on Computational Complexity: 2012's invited speaker (10 lectures)
Mathematical Sciences Research Institute (MSRI): fall 2011 workshop on Quantitative Geometry in Computer Science
4th Ann. Eastern Great Lakes (EaGL) Theory of Computation Workshop
Fields Institute: summer 2011 workshop on Approximability of CSPs
Isaac Newton Institute for Mathematical Sciences: spring 2011 semester on discrete analysis
Centre Emile Borel (Institute Henri Poincaré): spring 2011 trimester on approximation algorithms (4 lectures)
14th Semiannual New York Area Theory Day: fall 2010
China Theory Week 2010: Keynote talk
Institute for Advanced Study: 2010 workshop on Pseudorandomness in Mathematical Structures
Toyota Technological Institute – Chicago (TTI-C): spring 2009 workshop on Approximation Algorithms and their Limitations
Mathematical Sciences Research Institute (MSRI): fall 2008 workshop on Discrete Rigidity Phenomena in Additive Combinatorics
Banff International Research Station (BIRS): summer 2008 workshop on Analytic Tools in Computational Complexity
STOC 2008: Invited tutorial speaker
Cornell Workshop on Probability Theory and Computer Science: spring 2008 workshop on discrete harmonic analysis and its applications

American Institute for Mathematics (AIM) Research Workshop:
fall 2007 seminar on Algorithmic Convex Geometry
Schloss-Dagstuhl Seminar:
fall 2007 seminar on Algebraic Methods in Comp. Complexity
International Center for Mathematical Sciences (ICMS):
spring 2007 workshop on Geometry and Algorithms
Banff International Research Station (BIRS):
summer 2006 workshop on Recent Advances in Computational Complexity
American Mathematical Society (AMS) Central Section Meeting:
fall 2005 special session on Randomness in Computation
2nd Annual Pacific Northwest Theory Day: spring 2005
Mathematical Sciences Research Institute (MSRI):
spring 2005 workshop on Phase Transitions in Computation and Reconstruction
Yale Workshop on Discrete Mathematics and Theoretical Computer Sci.:
fall 2004 workshop on Harmonic Analysis of Boolean Functions
Schloss-Dagstuhl Seminar:
fall 2004 seminar on Algebraic Methods in Comp. Complexity

INVITED ACADEMIC TALKS:

Amazon Research: Seminar 2020
Microsoft Quantum: Seminar 2020
University of Texas, Austin: Quantum seminar 2020
Texas A&M: Mathematics seminar 2020
MIT: Theory seminar 2020
University of Texas, Austin: Theory seminar 2019
University of British Columbia: Probability seminar 2019
University of British Columbia: Algorithms seminar 2019
Institute for Advanced Study: Theory seminar 2018
Princeton University: Theory seminar 2018
Carnegie Mellon: Theory seminar 2017
Center for Quantum Technologies, NUS: Colloquium 2016
Harvard University: Theory seminar 2015
Harvard University: Theory seminar 2015 (again)
Columbia University: Theory seminar 2015
Kent State: Mathematics seminar 2015
Microsoft New England Research: Theory Colloquium 2013
Microsoft New England Research: Theory Colloquium 2013 (again)
Cornell University: Probability seminar 2013
Purdue University: CS Theory seminar 2012
Istanbul Center for Mathematical Sciences (IMBM): Math seminar 2011
Microsoft Redmond Theory Group: CS Theory seminar 2011
Institute for Advanced Study: Discrete mathematics seminar 2011

Institute for Advanced Study: Discrete mathematics seminar 2010
Microsoft Redmond Theory Group: CS Theory seminar 2010
University of Washington: Probability seminar 2010
Microsoft Silicon Valley Theory Group: CS Theory seminar 2009
Institute for Advanced Study (IAS): CS Theory seminar 2009
Microsoft New England Theory Group: CS Theory seminar 2009
MIT: CS Theory colloquium 2009
SUNY Buffalo: CS Theory seminar 2008
University of Toronto: CS Theory seminar 2008
MIT: CS Theory colloquium 2007
Carnegie Mellon: ACO seminar 2007
Penn State: CS Theory seminar 2007
Carnegie Mellon: CS Theory seminar 2006
Carnegie Mellon: CS Theory seminar 2006 (again)
UT Austin: CS Theory seminar 2006
MIT: Applied Mathematics seminar 2006
University of Pennsylvania: CS Theory seminar 2006
University of Chicago: CS Theory seminar 2006
Georgia Tech: CS Theory seminar 2006
Georgia Tech: CS Theory seminar 2006 (again)
Dartmouth College: Mathematics seminar 2006
University of British Columbia: Math Colloquium 2006
University of British Columbia: Discrete Math seminar 2006
UC Berkeley: CS Theory seminar 2005
UC Berkeley: CS Theory seminar 2005 (again)
Simon Fraser University: CS Theory seminar 2005
University of Washington: Probability seminar 2005
UC Berkeley: CS Theory seminar 2004
University of Washington: CS Theory seminar 2004
University of Washington: CS Theory seminar 2004 (again)
Microsoft Redmond Theory Group: CS Theory seminar 2004
Columbia University: CS Theory seminar, 2004
Yale University: CS Theory seminar 2004
Institute for Advanced Study (IAS): CS Theory seminar 2004
Institute for Advanced Study (IAS): CS Theory seminar 2003
Institute for Advanced Study (IAS): CS Theory seminar 2003 (again)
University of Washington: CS Theory seminar 2002
Microsoft Redmond Theory Group: CS Theory seminar 2002
University of Toronto: CS Theory seminar 2002

CONFERENCE TALKS: ITCS 2017, FSTTCS 2014, ICALP 2009, STOC 2008, FOCS 2006, LATIN 2006, FOCS 2005, STOC 2005, FOCS 2003, CCC 2003, STOC 2003, FOCS 2002, STOC 2002, Mathematics and Computer Science II 2003, SODA 2002.

JOURNAL ARTICLES:

1. R. O'Donnell, J. Wright.
   Efficient quantum tomography.
   Journal of the ACM, to appear. Previously in STOC *2016, QIP 2016*.
2. S. Mohanty, R. O'Donnell, P. Paredes.
   Explicit near-Ramanujan graphs of every degree.
   SIAM Journal of Computing, special issue for *STOC* 2020.
3. R. O'Donnell, T.Schramm.
   Sherali-Adams strikes back.
   Theory of Computing, to appear.
   Previously in *CCC 2019*.
4. A. De, R. O'Donnell, R. Servedio.
   Sharp bounds for population recovery.
   Theory of Computing 16(6), pp. 1-20 (2020).
5. A. De, R. O'Donnell, R. Servedio.
   Optimal mean-based algorithms for trace reconstruction.
   Annals of Applied Probability 29(2) pp. 851-874 (2019).
   Previously in *STOC* 2017.
6. R. O'Donnell, A. C. C. Say
   The weakness of CTC qubits and the power of approximate counting.
   ACM Transactions on Computation Theory 10(2), no. 5 (2018).
7. R. O'Donnell, J. Wright.
   A new point of NP-hardness for Unique Games.
   Journal of the ACM, to appear.
   Previously in *STOC* 2012.
8. G. Kindler, N. Kirshner, R. O'Donnell.
   Gaussian noise sensitivity and Fourier tails.
   Israel Journal of Mathematics 225(1), pp. 71-109 (2018).
   Previously in *CCC* 2012.
9. I. Benjamini, S.-O. Chan, R. O'Donnell, O. Tamuz, L.-Y. Tan.
   Convergence, unanimity and disagreement in majority dynamics on unimodular graphs and random graphs.
   Stochastic Processes and their Applications 126(9), pp. 2719-2733 (2016).
10. M. Kauers, R. O'Donnell, L.-Y. Tan, Y. Zhou.
    Hypercontractive inequalities via SOS, and the Frankl-Rödl graph.
    Discrete Analysis 4 (2016).
    Previously in *SODA* 2014.
11. P. Austrin, R. O'Donnell, L.-Y. Tan, J. Wright.
    New NP-hardness results for 3-Coloring and 2-to-1 Label Cover.
    Transactions on Computation Theory 6(1), pp. 2:1-20 (2014).
    Previously in *APPROX* 2012 under the title
    "A new point of NP-hardness for 2-to-1 Label Cover"

12. R. O'Donnell, Y. Wu, Y. Zhou.
    Optimal lower bounds for locality sensitive hashing
    (except when q is tiny).
    Transactions on Computation Theory 6(1), pp. 5:1-13 (2014).
    Previously in *ITCS* 2011.
13. R. O'Donnell, K. Wimmer.
    Sharpness of KKL on Schreier graphs.
    Electronic Communications in Probability 18(8), pp. 1-12 (2013).
14. R. O'Donnell, K. Wimmer.
    KKL, Kruskal-Katona, and monotone nets.
    SIAM Journal on Computing 42(6), pp. 2375–2399 (2013).
    Invited paper, special issue for *FOCS* 2009.
15. G. Kindler, R. O'Donnell, A. Rao, A. Wigderson.
    Spherical cubes: optimal foams from computational hardness
    amplification.
    Communications of the ACM 55(10), pp. 90-97 (2012).
    Previously in FOCS 2008 under the title
    "Spherical cubes and rounding in high dimensions"
16. Joint with "D.H.J. Polymath" (a mathematical collective,
    see http://michaelnielsen.org/polymath1/)
    A new proof of the density Hales-Jewett theorem.
    Annals of Mathematics 175(3), pp. 1283-1327 (2012).
17. R. O'Donnell, R. Servedio.
    The Chow parameters problem.
    SIAM Journal of Computing 40(1), pp. 165-199 (2011).
    Previously in *STOC* 2008.
18. P. Gopalan, R. O'Donnell, R. Servedio, A. Shpilka, K. Wimmer.
    Testing Fourier dimensionality and sparsity.
    SIAM Journal on Computing 40(4), pp. 1075–1100 (2011).
    Previously in *ICALP* 2009.
19. E. Blais, R. O'Donnell, K. Wimmer.
    Polynomial regression under arbitrary product distributions.
    Machine Learning 80(2-3), pp. 273–294 (2010).
    Invited paper, special issue for *COLT* 2008.
20. R. O'Donnell, R. Servedio.
    New degree bounds for polynomial threshold functions.
    Combinatorica 30(3), pp. 327–358 (2010).
    Previously in *STOC* 2003.
21. E. Mossel, R. O'Donnell, K. Oleszkiewicz.
    Noise stability of functions with low influences: invariance and
    optimality
    Annals of Mathematics 171(1), pp. 295–341 (2010).
    Previously in *FOCS* 2005.

22. K. Matulef, R. O'Donnell, R. Rubinfeld, R. Servedio.
Testing halfspaces.
SIAM Journal of Computing 39(3), pp. 2004–2047 (2010).
Previously in *SODA* 2009.
23. S. Khot, R. O'Donnell.
SDP gaps and UGC-hardness for Max-Cut-Gain.
Theory of Computing 5, pp. 83–117 (2009).
Previously in *FOCS* 2006.
24. J. Feldman, R. O'Donnell, R. Servedio.
Learning mixtures of product distributions over discrete domains.
SIAM Journal of Computing 37(5), pp. 1536–1564 (2008).
Previously in *FOCS* 2005.
25. B. Bollobás, G. Kindler, I. Leader, R. O'Donnell.
Eliminating cycles in the discrete torus.
Algorithmica 50(4), pp. 446–454 (2008).
Invited paper, special issue for *LATIN* 2006.
26. R. O'Donnell, R. Servedio.
Extremal properties of polynomial threshold functions.
Journal of Computer and System Sciences 74(3), pp. 298–312 (2008).
Invited paper, special issue for *CCC* 2003.
27. R. O'Donnell, R. Servedio.
Learning monotone decision trees in polynomial time.
SIAM Journal of Computing 37(3), pp. 827–844 (2007).
Previously in *CCC* 2006.
28. I. Dinur, E. Friedgut, G. Kindler, R. O'Donnell.
On the Fourier tails of bounded functions over the discrete cube.
Israel Journal of Mathematics 160(1), pp. 389–412 (2007).
Previously in *STOC* 2006.
29. S. Khot, G. Kindler, E. Mossel, R. O'Donnell.
Optimal inapproximability results for MAX-CUT and other two-variable CSPs?
SIAM Journal of Computing 37(1), pp. 319–357 (2007).
Invited paper, special issue for *FOCS* 2004.
30. E. Mossel, R. O'Donnell, O. Regev, J. Steif, B. Sudakov.
Non-interactive correlation distillation, inhomogeneous Markov chains, and the reverse Bonami-Beckner inequality.
Israel Journal of Mathematics 154(1), pp. 299–336 (2006).
31. N. Bshouty, E. Mossel, R. O'Donnell, R. Servedio.
Learning DNF from random walks.
Journal of Computer and System Sciences 71(3), pp. 250–265 (2005).
Invited paper, special issue for *FOCS* 2003.

32. E. Mossel, R. O'Donnell.
Coin flipping from a cosmic source: On error correction of truly random bits.
Random Structures & Algorithms 26(4), pp. 418–436 (2005).
33. E. Mossel, R. O'Donnell, R. Servedio.
Learning functions of k relevant variables.
Journal of Computer and System Sciences 69(3), pp. 421–434 (2004).
Invited paper, special issue for *STOC* 2003, previously titled "Learning juntas"
34. R. O'Donnell.
Hardness amplification within NP.
Journal of Computer and System Sciences 69(1) pp. 68–94 (2004).
Invited paper, special issue for *STOC* 2002.
35. A. Klivans, R. O'Donnell, R. Servedio.
Learning intersections and thresholds of halfspaces.
Journal of Computer and System Sciences 68(4), pp. 808–840 (2004).
Invited paper, special issue for *FOCS* 2002.
36. E. Mossel, R. O'Donnell.
On the noise sensitivity of monotone functions.
Random Structures & Algorithms 23(3), pp. 333–350 (2003).
37. A. Corduneanu, C. Hsia, R. O'Donnell.
A greedy algorithm for solving meeting mixing problems.
UMAP Journal 18(3), pp. 331–342 (1997).

REFEREED CONFERENCE PUBLICATIONS (NOT APPEARING ABOVE):

38. C. Bădescu, R. O'Donnell.
Improved quantum data analysis
STOC 2021.
39. M. Hastings, J. Haah, R. O'Donnell.
Fiber bundle codes: Breaking the $N^{1/2}$polylog(N) barrier for quantum LDPC codes
QIP 2021, STOC 2021.
40. R. Venkateswaran, R. O'Donnell. *(author order randomized)*
Quantum approximate counting with nonadaptive Grover iterations
STACS 2021.
41. R. O'Donnell, X. Wu. *(author order randomized)*
Explicit near-fully X-Ramanujan graphs
FOCS 2020.
42. R. O'Donnell, R. Servedio, L.-Y. Tan
Fooling Gaussian PTFs via local hyperconcentration
STOC 2020.

43. C. Bădescu, R. O'Donnell.
    Lower bounds for testing complete positivity and quantum separability.
    LATIN 2020.
44. S. Mohanty, R. O'Donnell, P. Paredes.
    The SDP value for random two-eigenvalue CSPs.
    STACS 2020.
45. S. Mohanty, R. O'Donnell.
    X-Ramanujan graphs.
    SODA 2020.
46. Y. Filmus, R. O'Donnell, X. Wu.
    A log-Sobolev inequality for the multislice, with applications.
    ITCS 2019.
47. R. O'Donnell, R. Servedio, L.-Y. Tan.
    Fooling polytopes.
    STOC 2019.
48. Y. Deshpande, A. Montanari, R. O'Donnell, T. Schramm, S. Sen.
    The threshold for SDP-refutation of random regular NAE-3SAT.
    SODA 2019.
49. P. Kothari, R. O'Donnell, T. Schramm.
    SOS lower bounds with hard constraints: think global, act local.
    ITCS 2019.
50. C. Bădescu, R. O'Donnell, J. Wright.
    Quantum state certification.
    QIP 2018, STOC 2019.
51. R. O'Donnell, Y. Zhao.
    On closeness to *k*-wise uniformity.
    RANDOM 2018.
52. J. Li, R. O'Donnell.
    Bounding laconic proof systems by solving CSPs in parallel.
    SPAA 2017.
53. G. Kindler, R. O'Donnell.
    Quantum automata cannot detect biased coins, even in the limit.
    ICALP 2017.
54. P. Kothari, R. Mori, R. O'Donnell, D. Witmer.
    Sum of squares lower bounds for refuting any CSP.
    STOC 2017.
55. R. O'Donnell, J. Wright.
    Efficient quantum tomography II
    STOC 2017.
56. R. O'Donnell.
    SOS is not obviously automatizable, even approximately.
    ITCS 2017.

57. R. O'Donnell, Y. Zhao.
Polynomial bounds for decoupling, with applications.
CCC 2016.
58. B. Barak, A. Moitra, R. O'Donnell, P. Raghavendra, O. Regev, D. Steurer, L. Trevisan, A. Vijayaraghavan, D. Witmer, J. Wright.
Beating the random assignment on constraint satisfaction problems of bounded degree.
APPROX 2015.
59. S. R. Allen, R. O'Donnell, D. Witmer.
How to refute a random CSP.
FOCS 2015.
60. C. Caferov, B. Kaya, R. O'Donnell, A.C.C. Say.
Optimal lower bounds for estimating entropy with PMF queries.
MFCS 2015.
61. R. O'Donnell, J. Wright
Quantum spectrum testing
STOC 2015, QIP 2015.
62. S. R. Allen, R. O'Donnell
Conditioning and covariance on caterpillars
ITW 2015.
63. R. O'Donnell, A. C. C. Say
One time-traveling bit is as good as logarithmically many
FSTTCS 2014.
64. J. Håstad, S. Huang, R. Manokaran, R. O'Donnell, J. Wright.
Improved NP-inapproximability for 2-variable linear equations.
APPROX 2015.
65. S. Dughmi, N. Immorlica, R. O'Donnell, L.-Y. Tan.
Algorithmic signaling of features in auction design.
SAGT 2015.
66. R. O'Donnell, X. Sun, L.-Y. Tan, J. Wright, Y. Zhao
A composition theorem for parity kill number.
CCC 2014.
67. R. O'Donnell, D. Witmer
Goldreich's PRG: Evidence for near-optimal polynomial stretch
CCC 2014.
68. R. O'Donnell, J. Wright, C. Wu, Y. Zhou
Hardness of robust graph isomorphism, Lasserre gaps, and asymmetry of random graphs.
SODA 2014.
69. P. Kothari, A. Nayyeri, R. O'Donnell, C. Wu
Testing surface area.
SODA 2014.

70. C. Daskalakis, I. Diakonikolas, R. O'Donnell, R. Servedio, L.-Y. Tan
Learning sums of independent integer random variables.
FOCS 2013
71. R. O'Donnell, L.-Y. Tan.
A composition theorem for the Fourier Entropy-Influence conjecture.
ICALP 2013.
72. R. O'Donnell, Y. Zhou.
Approximability and proof complexity.
SODA 2013.
73. G. Kun, R. O'Donnell, S. Tamaki, Y. Yoshida, Y. Zhou.
Linear programming, width-1 CSPs, and robust satisfaction.
ITCS 2011.
74. R. O'Donnell, J. Wright, Y. Zhou.
The Fourier Entropy–Influence Conjecture for some classes of functions.
ICALP 2011.
75. R. O'Donnell, Y. Wu, Y. Zhou.
Hardness of Max-2Lin and Max-3Lin over integers, reals, and large cyclic groups.
CCC 2011.
76. A. Moitra, R. O'Donnell.
Pareto optimal solutions for smoothed analysts.
STOC 2011.
77. I. Diakonikolas, R. O'Donnell, R. Servedio, Y. Wu.
Hardness results for agnostic learning low degree polynomial threshold functions.
SODA 2011.
78. V. Guruswami, S. Khot, R. O'Donnell, P. Popat, M. Tulsiani, Y. Wu.
SDP gaps for 2-to-1 and other Label-Cover variants.
ICALP 2010.
79. P. Gopalan, R. O'Donnell, Y. Wu, D. Zuckerman.
Fooling functions of halfspaces under product distributions.
CCC 2010.
80. E. Blais, R. O'Donnell.
Lower bounds for testing function isomorphism.
CCC 2010.
81. J. Aspnes, E. Blais, M. Demirbas, R. O'Donnell, A. Rudra, S. Uurtamo.
k+ decision trees.
ALGOSENSORS 2010.
82. K. Matulef, R. O'Donnell, R. Rubinfeld, R. Servedio.
Testing {-1,1}-weight halfspaces.
RANDOM 2009.

83. R. O'Donnell, Y. Wu.
Conditional hardness for satisfiable 3-CSPs.
STOC 2009.
84. R. O'Donnell, Y. Wu.
3-Bit Dictator testing: 1 vs. 5/8.
SODA 2009.
85. A. Klivans, R. O'Donnell, R. Servedio.
Learning geometric concepts via surface area.
FOCS 2008.
86. R. O'Donnell, Y. Wu.
An optimal SDP algorithm for Max-Cut, and equally optimal Long Code tests.
STOC 2008.
87. R. O'Donnell, K. Wimmer.
Approximation by DNF: examples and counterexamples.
ICALP 2007.
88. U. Feige, G. Kindler, R. O'Donnell.
Understanding parallel repetition requires understanding foams.
CCC 2007.
89. J. Feldman, R. O'Donnell, R. Servedio.
PAC learning mixtures of Gaussians with no separation assumption.
COLT 2006.
90. R. O'Donnell, M. Saks, O. Schramm, R. Servedio.
Every decision tree has an influential variable.
FOCS 2005.
91. E. Mossel, R. O'Donnell.
On the noise sensitivity of monotone functions.
Mathematics and Computer Science II 2002.
92. L. Engebretsen, P. Indyk, R. O'Donnell.
Derandomized dimensionality reduction with applications.
SODA 2002.

MANUSCRIPTS:

93. R. O'Donnell, D. Witmer.
Markov chain methods for small-set expansion.
94. G. Kindler, R. O'Donnell, D. Witmer.
Remarks on the Most Informative Function Conjecture at fixed mean.
95. A. De, R. O'Donnell, R. Servedio.
Learning sparse mixtures of rankings from noisy information.
96. S. Chen, J. Li, R. O'Donnell.
Towards instance-optimal quantum state certification with independent measurements
97. R. O'Donnell, R. Venkateswaran.
The Quantum Union Bound made easy

98. A. Musipatla, R. O'Donnell, T. Schramm, X. Wu.
The SDP value of random 2CSPs.

INVITED PAPERS:

99. R. O'Donnell, John Wright.
A primer on the statistics of longest increasing subsequences and quantum states.
Survey invited to 2017 SIGACT News complexity theory column

100. R. O'Donnell.
Social choice, computational complexity, Gaussian geometry, and Boolean functions
Article accompanying invited ICM 2014 talk

101. R. O'Donnell.
Some topics in analysis of boolean functions.
Survey accompanying STOC 2008 tutorial

BOOKS/ LONG DOCUMENTS:

102. R. O'Donnell.
Analysis of Boolean Functions.
Cambridge University Press 2014

103. R. O'Donnell.
Computational aspects of noise sensitivity.
MIT Ph.D. Thesis 2003

PATENT:

104. M. Aiken, R. O'Donnell.
Fair share dynamic resource allocation scheme with a safety buffer.
US Patent #6625709