CURRICULUM VITAE

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EDUCATION

Massachusetts Institute of Technology	Ph.D. (Mathematics)	1978
University of California, Berkeley	A.B. (Mathematics)	1973

Research interests: Computational complexity, quantum computation, algorithms, mathematical logic

TEACHING AND RESEARCH POSITIONS

9/92 - present	Computer Science Department Professor (Chairman 1986-1990, and 1993) Assistant Prof. 1982-1986, Associate Prof. 1986-1992 Boston University Boston, MA
1/08 - 7/08	Visiting Scholar Computer Science Department Harvard University Cambridge, MA
8/96 - 1/97	Visiting Professor Mathematical Institute Oxford University Oxford, England
9/88 - 8/89	Guest Professor and Fulbright Fellow Mathematical Institute Heidelberg University Heidelberg, West Germany
9/79 - 1/80	Visiting Scholar Department of Mathematics M.I.T. Cambridge, Massachusetts
9/78 - 6/82	Assistant Professor Department of Mathematical Sciences DePaul University Chicago, Illinois

PUBLICATIONS

1. Two Splitting Theorems for Beta-Recursion Theory, Annals of Mathematical Logic (18) 1980, pp. 137-151.

2. Degrees of Non-Alpha-Speedable Sets, (with Barry Jacobs), Zeitschrifft fur Mathematische Logik und Grundlagen der Mathematik, (27) 1981, pp. 539-548.
   Also appeared as, Computer Science Technical Report #668, University of Maryland, 1979.

3. Some Properties of the Lattice of NP Sets, In Workshop on Recursion-Theoretic Aspects of Computer Science, Purdue University, 1981, pp. 18-22.

4. Admissible Recursion Theory, in , Ligouri Editori, 1981, pp. 7-30.

5. Quadratic Automata, (with Jerry Goldman), Journal of Computer and Systems Sciences, (24) 1982, pp. 180-196.

6. Inverting the 1/2-Jump, (with Gerald Sacks), Transactions of the AMS, (278) 1983, pp. 317-331.

7. Intermediate β-R.E. Degrees and the 1/2-Jump, Journal of Symbolic Logic, (48) 1983, pp. 790-796.

8. Oracle Dependent Properties of the Lattice of NP Sets, (with W. Maass), Theoretical Computer Science (24) 1983, pp. 279-289.

9. Relativizations Comparing NP and Exponential Time, (with William Gasarch), Information and Control (58) 1983, pp. 88-100.

10. On Creative Sets in NP, B.U. Tech Report # TR-2-83, 1983.

11. Minimal Degrees for Honest Polynomial Reducibilities, 20th IEEE Symposium on Foundations of Computer Science, 1984, pp. 300-308.

12. Doubly Periodic Sequences and Double Recurrence Relations, (with Jerry Goldman), SIAM Journal of Discrete and Algebraic Methods, (6), 1985, pp. 360-370.

13. Minimal Polynomial Degrees of Nonrecursive Sets, in "Recursion Theory Week at Oberwolfach," April 1984, Springer Lecture Notes #1141, 1985, pp. 193-202.

14. The Complexity of Provable Properties of First-Order Theories, (with John Reif), Information and Control (69), 1986, pp. 1-11.
   Also appeared as, Harvard University Technical Report, TR-21-80.

15. On Simple and Creative Sets in NP, Theoretical Computer Science, 47 (1986), pp. 169-180.
   Also appeared as, Boston University Technical Report, 84/002.

16. Recursion-Theoretic Properties of Minimal Honest Polynomial Degrees, (with W. Gasarch), Boston University Tech Report #87-005.

17. Minimal Degrees for Polynomial Reducibilities, Journal of the Association for Computing Machinery, (34), 1987, pp. 480-491.

18. Honest Polynomial Degrees and P =? NP, (with T. Long), Theoretical Computer Science (51), 1987, pages 265-280.

19. Quadratic Queries and Statistical Database Security, (with Jerry Goldman), Boston University Tech Report #88-010.

20. Absolute Results Concerning One-Way Functions and Their Applications, (with J. Wang), Mathematical Systems Theory (22), 1989, pp. 21-35.
   Also appeared as, Boston University Technical Report 87-006.

21. Complete Problems and Strong Polynomial Reducibilities, (with K. Ganesan), SIAM Journal on Computing (31), 1992, pp. 733-742.

1989, pp. 240-250.

22. Oracles for Structural Properties: The Isomorphism Conjecture and Public-Key Cryptography (with Alan Selman), Journal of Computer and Systems Sciences, (44), 1992, pp. 287-301.
Also appeared in, Fourth Structure in Complexity Theory Conference, Eugene, Oregon, 1989, pp. 3-14.

23. On Honest Polynomial Reductions, Relativizations, and P=NP, (with R. Downey, W.I. Gasarch and M. Moses), Fourth Structure in Complexity Theory Conference, Eugene, Oregon, 1989, pp. 196-207.

24. Doubly-Periodic Sequences and a Class of Two-Dimensional Cyclic Codes, (with Jerry Goldman), Advances in Applied Mathematics, (13), 1992, pp. 48-61.

25. The Isomorphism Conjecture and Its Generalizations, in Logic and Computer Science, Springer Lecture Notes in Mathematics #1429, 1990, pp. 1-11.

26. Almost Everywhere Complexity Hierarchies for Nondeterministic Time, (with E. Allender, R. Beigel and U. Hertrampf), Theoretical Computer Science, 115, 1993, pp. 225-241.
Preliminary version in, Symposium on Theoretical Aspects of Computer Science, Rouen, France, 1990, pp. 1-11.

27. Minimal Pairs and Complete Problems, (with K. Ambos-Spies and R. Soare), I. Theoretical Computer Science, 132, 1994, pp. 229-241.
Preliminary version in, Symposium on Theoretical Aspects of Computer Science, Rouen, France, 1990, pp. 24-36.

28. Honest Polynomial Reductions and Exptally Sets, (with K. Ambos-Spies and D.P. Yang), Proceedings of the 1989 Oberwolfach Recursion Theory Week, Springer Lecture Notes in Mathematics #1432, 1990, pp. 1-22.

29. Complexity Theory,(with Alan Selman), encyclopedia article in The Encyclopedia of Computer Science and Technology, 1992, M. Dekker Press, pp. 77-100.

30. Completeness for Nondeterministic Complexity Classes, (with H. Buhrman and L. Torenvliet), Math. Systems Theory 24, (1991), pp. 179-200.

31. Structural Properties of Nondeterministic Complete Sets, Fifth Structure in Complexity Theory Conference, Barcelona, Spain, July 1990, pp. 3-10.

32. On Reductions of NP Sets to Sparse Sets, (with Luc Longpre), Siam Journal on Computing, 1994, pp. 324 - 336.
Also appeared in 6th Annual Proc. Structure in Complexity Theory Conference (1991) Chicago, Illinois, July 1991, pp. 79-88.

33. Immunity of Complete Problems, (with J. Wang), Information and Computation 110, (1994), pages 119-130.

34. Superpolynomial Circuits, Almost Sparse Oracles and the Exponential Hierarchy, (with H. Buhrman), 12th Conf. on Foundations of Software Technology and Theoretical Computer Science, New Delhi, India, December 1992, pages 116-127.
Also appeared as Boston University Technical Report #91-005, 1991.

35. Scalability and Density in P, (with Judy Goldsmith), Information Processing Letters 57, 1996, pages 137-143.
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36. On 1-Truth-Table-Hard Languages, (with Stuart Kurtz and James Royer),
Theoretical Computer Science, 155, (1993), pp. 383-389.

37. On Using Oracles That Compute Values, (with Stephen Fenner, Mitsunori Ogiwara and Alan Selman), SIAM J. on Computing 26 (4), 1997, pp. 1043-1065.
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38. On the Performance of Polynomial-Time CLIQUE-Approximation Algorithms on very large Graphs, (with Marcus Peinado), In Cliques, Coloring and Satisfiability: Second DIMACS Implementation Challenge 1993, David Johnson and Michael Trick, editors, AMS Press, DIMACS Series 26, 1996, pages 147-168.

39. Learning Counting Functions With Queries, (with Zhixiang Chen), Theoretical Computer Science 180, 1997, pages 155-168. Also in Proceedings of the 1994 Conference on Learning Theory, pp. 218-227.

40. Complexity Theory: Current Research, (edited with Klaus Ambos-Spies and Uwe Schoening), Cambridge University Press, 1993.

41. A Highly Parallel Algorithm to Approximate MaxCut on Distributed Memory Architectures, (with Marcus Peinado), Proceedings of the 9th International Parallel Process Symposium, April 1995, pp. 113-118.

42. On the Learnability of Z_N-DNF Formulas, (with Nader Bshouty, Zhixiang Chen and Scott Decatur), in Proceeding of the 1995 Conference on Learning Theory, July 1995.

43. Learning Discretized Geometric Concepts, (with Zhixiang Chen and Nader Bshouty), Annual Conferences on Foundation of Computer Science, 1994, pages 54-63.

44. Exponential Time Lower Bounds for Non-Uniform Complexity Classes, (with Sarah Mocas), 20th International Symposium on the Mathematical Foundations of Computer Science, Lecture Notes in Computer Science 969, 1995, pages 159 - 168

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46. The Bounded Injury Priority Method and \ the Learnability of Unions of Rectangles, (with Zhixiang Chen), Annals of Pure and Applied Logic 77, 1996, pages 143-168.

47. Finding a Hidden Code by Asking Questions, (with Zhixiang Chen and Carlos Cunha), Proceedings of the Second International COCOON Conference, 1996 Springer Lecture Notes #1090, pages 50 - 56.

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51. Design and Performance of Parallel and Distributed Approximation Algorithms for Maxcut (with Marcus Peinado), Journal of Parallel and Distributed Computing 46, 48-61, 1997.

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64. Some properties of sets in the plane closed under linear extrapolation by a fixed parameter, (with Stephen Fenner, Fred Green and Rohit Gurjar), Arxiv, no. 1212.2889, December 12, 2012.

65. Turing and the development of computational complexity, (with Alan Selman), In the volume Turing's Legacy, Lecture Notes in Logic, edited by Rod Downey, Association for Symbolic Logic and Cambridge University Press, 2014, pages 299-328. Earlier version appeared as The University at Buffalo technical report 2011-06, 2011

66. Storing Computation, (with Jonathan Appavoo and Amos Waterland), Proc. of IEEE Issue on "Memories in the Future of Information Processing," in preparation.