

## Short Vita: Michael Todd

Leon C. Welch Professor,  
School of Operations Research and Information Engineering,  
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### Education:

B.A., Mathematics, Cambridge University, England, 1968.  
Ph.D., Administrative Sciences, Yale University, 1972.

### Professional Experience:

1973-present, Assistant, Associate, and Full Professor, OR&IE,  
Cornell University.  
1971-1973, Lecturer and Assistant Professor,  
Operations Research and Planning, University of Ottawa.

### Honors:

Guggenheim Fellowship, John Simon Guggenheim Memorial Foundation, 1980-81.  
Sloan Research Fellowship, Alfred P. Sloan Foundation, 1981-85.  
George B. Dantzig Prize, Mathematical Programming Society and SIAM, 1988.  
John von Neumann Theory Prize, Institute for Operations Research and the  
Management Sciences, 2003.  
INFORMS Fellow, Institute for Operations Research and the Management Sciences, 2004.  
SIAM Fellow, Society for Industrial and Applied Mathematics, 2008.

### Special Appointments:

Fields Institute for Research in Mathematical Sciences, Toronto.  
Department of Mathematical Sciences, Carnegie-Mellon University.  
Cowles Foundation for Research in Economics, Yale University.  
OR Center, MIT.  
Department of Mathematics, University of Washington.  
BellCore.  
Department of Applied Mathematics and Theoretical Physics, Cambridge University.  
CORE, Leuven, Belgium.

### Editorial Positions:

Co-Editor, Editor-in-Chief, Associate Editor, Senior Editor: Mathematical Programming, 1980-  
present.  
Associate Editor: Mathematics of Operations Research, 1978-2000.  
Associate Editor: Operations Research, 1982-86.  
Member of Editorial Board: SIAM Journal on Optimization, 1997-2007.  
Member of Editorial Board: Foundations of Computational Mathematics,  
2000-present, Managing Editor 2008-present.  
Member of Editorial Board: Acta Numerica, 2013-present.  
Member of Editorial Board: Foundations and Trends in Optimization, 2013-present.

Grants and Contracts:

NSF, 1974-2011.

ONR, 1987-2010.

AFOSR, 1990-1993.

Selected Publications:

(1977) Union Jack triangulations, in: Fixed Points: Algorithms and Applications (S. Karamardian, ed.), Academic Press, New York, 315-336.

(1976) On triangulations for computing fixed points, *Mathematical Programming* 10 322-346.

(1978) Efficient acceleration techniques for fixed-point algorithms (with R. Saigal), *SIAM Journal on Numerical Analysis* 15 997-1007.

(1980) Traversing large pieces of linearity in algorithms that solve equations by following piecewise-linear paths, *Mathematics of Operations Research* 5 242-257.

(1980) The monotonic bounded Hirsch conjecture is false for dimension at least four, *Mathematics of Operations Research* 5 599-601.

(1980) The ellipsoid method: a survey (with R.G. Bland and D. Goldfarb), *Operations Research* 29 1039-1091.

(1982) An introduction to piecewise-linear homotopy algorithms for solving systems of equations, in: *Topics in Numerical Analysis* (P.R. Turner, ed.), *Lecture Notes in Mathematics* 965, Springer-Verlag, Berlin-Heidelberg-New York, 149-202.

(1983) Large-scale linear programming: geometry, working bases and factorizations, *Mathematical Programming* 26 1-20.

(1985) Linear and quadratic programming in oriented matroids, *Journal of Combinatorial Theory (B)* 39 105-133.

(1985) The ellipsoid method generates dual variables (with B. Burrell), *Mathematics of Operations Research* 10 688-700.

(1986) Polynomial expected behavior of a pivoting algorithm for linear complementarity and linear programming problems, *Mathematical Programming* 35 173-192.

(1989) Linear programming (with D. Goldfarb), in: *Handbooks in Operations Research and Management Science*, vol. 1: Optimization (G.L. Nemhauser, A.H.G. Rinnooy Kan and M.J. Todd, eds.), North Holland, Amsterdam, 73-170.

(1990) A centered projective algorithm for linear programming (with Y. Ye), *Mathematics of Operations Research* 15 508-529.

(1991) Probabilistic models for linear programming, *Mathematics of Operations Research* 16 671-693.

(1993) On the complexity of approximating the maximal inscribed ellipsoid for a polytope (with L.G. Khachiyan), *Mathematical Programming* 61 137-159.

(1994) An  $O(\sqrt{n}L)$ -iteration homogeneous and self-dual linear programming algorithm (Y. Ye, M.J. Todd, and S. Mizuno), *Mathematics of Operations Research* 19 53-67.

(1996) A lower bound on the number of iterations of long-step and polynomial interior-point linear programming algorithms (with Y. Ye), *Annals of Operations Research* 62 233-252.

(1997) Self-scaled barriers and interior-point methods for convex programming (with Yu. E. Nesterov), *Mathematics of Operations Research* 22 1-42.

(1999) SDPT3 — a Matlab software package for semidefinite programming, Version 1.3 (K.C. Toh, M.J. Todd, and R.H. Tutuncu), *Optimization Methods and Software* 11 545-581.

(2001) Semidefinite optimization, *Acta Numerica* 10 515-560.

(2002) On the Riemannian geometry defined by self-concordant barriers and interior-point methods (Yu.E. Nesterov and M.J. Todd), *Foundations of Computational Mathematics* 2 333-361.

- (2007) Distance Weighted Discrimination (J.S. Marron, M.J. Todd, and J. Ahn), *Journal of the American Statistical Association* 102 1267–1271.
- (2008) Linear convergence of a modified Frank-Wolfe algorithm for computing minimum volume enclosing ellipsoids (S.D. Ahipasaoglu, P. Sun, and M.J. Todd), *Optimization Methods and Software* 23 5–19.

Books:

- (1976) *The Computation of Fixed Points and Applications*, Springer-Verlag, Berlin
- (1983) *Homotopy Methods and Global Convergence*, edited with B.C. Eaves, F.J. Gould and H.-O. Peitgen, Plenum Press, New York-London
- (1989) *Optimization*, volume 1 of *Handbooks in Operations Research and Management Science*, edited with G.L. Nemhauser and A.H.G. Rinnooy Kan, North Holland, Amsterdam
- (1990) *Mathematical Developments Arising from Linear Programming*, *Contemporary Mathematics* 114, edited with J.C. Lagarias, American Mathematical Society, Providence

Doctoral Students:

D. Strip,	1978
S.A. Awoniyi,	1980
A. Vardi,	1980
C.-M. Ip,	1985
W.D. Morris, Jr.,	1986
J.E. Mitchell,	1988
Y. Wang,	1991
A. Liao,	1991
K.A. McShane,	1992
L. Tuncel,	1993
J.S. Shahabuddin,	1996
R.H. Tutuncu,	1996
R.A. Hauser,	2000
M. Wagner,	2000
E.A. Yildirim,	2001
B.K. Rangarajan,	2004
P. Richtarik,	2007
S.D. Ahipasaoglu,	2009