

Mark Tygert

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Date of birth: November 19, 1979

Education

B.A., MATHEMATICS, PRINCETON
September 1997 – June 2001

PH.D., APPLIED MATHEMATICS, YALE
September 2001 – June 2004

Employment

POSTDOCTORAL RESEARCHER
Yale University, Math Dept.
July 2004 – June 2008

VISITING ASSISTANT PROFESSOR
UCLA, Math Dept.
July 2008 – June 2009

ASSISTANT PROFESSOR
NYU Courant Institute, Math Dept.
September 2009 –

Honors

DARPA Young Faculty Award

The 2010 U.S. National Academy of Sciences Award for Initiatives in Research

Sloan Research Fellowship

U.S. National Defense Science and Engineering Graduate Fellowship

Barry Goldwater, Robert Byrd, and National Merit Scholarships

Brown and Covington Prizes, the top awards to a junior and to a senior majoring in math at Princeton

Graduated summa cum laude and “with highest honors” from Princeton

2 Princeton President’s Awards for Academic Achievement

Current research interests

Statistics; computational science and engineering, particularly numerical analysis

Membership in and support of professional societies

SIAM and AWM

Publications

16. AN ALGORITHM FOR THE PRINCIPAL COMPONENT ANALYSIS OF LARGE DATA SETS, *SIAM Journal on Scientific Computing*, 33 (5): 2580–2594, 2011 (with Nathan Halko, Per-Gunnar Martinsson, and Yoel Shkolnisky).
15. COMPUTING THE CONFIDENCE LEVELS FOR A ROOT-MEAN-SQUARE TEST OF GOODNESS-OF-FIT, *Applied Mathematics and Computation*, 217 (22): 9072–9084, 2011 (with William Perkins and Rachel Ward).
14. A FAST RANDOMIZED ALGORITHM FOR ORTHOGONAL PROJECTION, *SIAM Journal on Scientific Computing*, 33 (2): 849–868, 2011 (with Edouard Coakley and Vladimir Rokhlin).
13. A RANDOMIZED ALGORITHM FOR THE DECOMPOSITION OF MATRICES, *Applied and Computational Harmonic Analysis*, 30 (1): 47–68, 2011 (with Per-Gunnar Martinsson and Vladimir Rokhlin).
12. STATISTICAL TESTS FOR WHETHER A GIVEN SET OF INDEPENDENT, IDENTICALLY DISTRIBUTED DRAWS COMES FROM A SPECIFIED PROBABILITY DENSITY, *Proceedings of the National Academy of Sciences (USA)*, 107 (38): 16471–16476, 2010.
11. FAST ALGORITHMS FOR SPHERICAL HARMONIC EXPANSIONS, III, *Journal of Computational Physics*, 229 (18): 6181–6192, 2010.
10. RECURRENCE RELATIONS AND FAST ALGORITHMS, *Applied and Computational Harmonic Analysis*, 28 (1): 121–128, 2010.
9. A RANDOMIZED ALGORITHM FOR PRINCIPAL COMPONENT ANALYSIS, *SIAM Journal on Matrix Analysis and Applications*, 31 (3): 1100–1124, 2009 (with Vladimir Rokhlin and Arthur Szlam).
8. FAST ALGORITHMS FOR SPHERICAL HARMONIC EXPANSIONS, II, *Journal of Computational Physics*, 227 (8): 4260–4279, 2008.
7. A FAST RANDOMIZED ALGORITHM FOR OVERDETERMINED LINEAR LEAST-SQUARES REGRESSION, *Proceedings of the National Academy of Sciences (USA)*, 105 (36): 13212–13217, 2008 (with Vladimir Rokhlin).
6. A FAST RANDOMIZED ALGORITHM FOR THE APPROXIMATION OF MATRICES, *Applied and Computational Harmonic Analysis*, 25 (3): 335–366, 2008 (with Franco Woolfe, Edo Liberty, and Vladimir Rokhlin).
5. RANDOMIZED ALGORITHMS FOR THE LOW-RANK APPROXIMATION OF MATRICES, *Proceedings of the National Academy of Sciences (USA)*, 104 (51): 20167–20172, 2007 (with Edo Liberty, Franco Woolfe, Per-Gunnar Martinsson, and Vladimir Rokhlin).
4. APPROXIMATION OF BANDLIMITED FUNCTIONS, *Applied and Computational Harmonic Analysis*, 21 (3): 413–420, 2006 (with Yoel Shkolnisky and Vladimir Rokhlin).
3. ON INTERPOLATION AND INTEGRATION IN FINITE-DIMENSIONAL SPACES OF BOUNDED FUNCTIONS, *Communications in Applied Mathematics and Computational Science*, 1: 133–142, 2006 (with Per-Gunnar Martinsson and Vladimir Rokhlin).
2. FAST ALGORITHMS FOR SPHERICAL HARMONIC EXPANSIONS, *SIAM Journal on Scientific Computing*, 27 (6): 1903–1928, 2006 (with Vladimir Rokhlin).
1. A FAST ALGORITHM FOR THE INVERSION OF GENERAL TOEPLITZ MATRICES, *Computers and Mathematics with Applications*, 50 (5–6): 741–752, 2005 (with Per-Gunnar Martinsson and Vladimir Rokhlin).

Courses taught

BASIC ANALYSIS IN FUNCTION SPACES
Yale undergraduate MATH 260b
Spring 2005

MULTILEVEL COMPRESSION OF LINEAR OPERATORS
Yale graduate AMTH 510a
Fall 2005

DIFFERENTIAL CALCULUS
Yale undergraduate MATH 112a
Fall 2006

MULTILEVEL COMPRESSION OF LINEAR OPERATORS
Yale graduate AMTH 510a
Fall 2006

INTRO. TO FUNCTIONS OF SEVERAL VARIABLES
Yale undergraduate MATH 118a
Fall 2007

EFFICIENT MATRIX COMPUTATIONS
Yale graduate AMTH/CPSC 951a
Fall 2007

OPTIMIZATION
UCLA undergraduate MATH 164
Winter 2009

COMPUTATIONAL LINEAR ALGEBRA
UCLA graduate MATH 270C
Spring 2009

COMPRESSION OF LINEAR OPERATORS
NYU graduate MATH-GA-2011.1/CSCI-GA-2945.1
Fall 2009

NUMERICAL METHODS WITH PROBABILITY
NYU graduate MATH-GA-2012.2/CSCI-GA-2945.2
Spring 2010

REAL VARIABLES
NYU graduate MATH-GA-2430.1
Fall 2010

MATHEMATICAL STATISTICS
NYU undergraduate MATH-UA-0234
Spring 2011

FAST MULTIPOLE METHODS
NYU graduate MATH-GA-2011.1/CSCI-GA-2945.2
Fall 2011

MATHEMATICAL STATISTICS
NYU undergraduate MATH-UA-0234
Spring 2012

MATHEMATICAL STATISTICS
NYU graduate MATH-GA-2962.001
Spring 2012