

# CURRICULUM VITAE

## Tien-Yien Li

### University Distinguished Professor Department of Mathematics

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### Personal Data

B.S. National Tsing Hua University, Taiwan, June 1968  
Ph.D. University of Maryland, August 1974

### Experience in Higher Education

1974 - 1976	Instructor	University of Utah
1976 - 1978	Assistant Professor	Michigan State University
1978 - 1979	Visiting Associate Professor	Mathematics Research Center University of Wisconsin
1979 - 1983	Associate Professor	Michigan State University
1983 - present	Professor	Michigan State University
1987 - 1988	Invited Guest Professor	Research Institute for Mathematical Sciences, Kyoto University, JAPAN
1998 (Fall)	Visiting Professor	Mathematical Sciences Research Institute, Berkeley, California
2000 (Fall)	Visiting Professor	City University of Hong Kong
1998 -	University Distinguished Professor	Michigan State University

### Honors

Guggenheim Fellow 1995 - 1996  
Distinguished Faculty Award 1995, Michigan State University  
J. S. Frame Award for Excellence in Teaching 1996, Michigan State University  
University Distinguished Professor 1998 - , Michigan State University  
Distinguished Alumni Award 2002, College of Sciences, National Tsing Hua  
University, Taiwan  
Outstanding Academic Advisor 2006, College of Natural Science,  
Michigan State University

Honorary Chair Professor 2006 - 2008, National Tsing Hua University, Taiwan  
Honorary Guest Professor, Tsing Hua University (Beijing), Jilin University (China)

### Professional Organizations

American Mathematical Society  
Society for Industrial and Applied Mathematics

### Invited Conference and Colloquium Talks:

- 11/26/84, Operations Research Society of America Meeting, Dallas, Texas
- 11/26/84, Southern Methodist University, Dallas, Texas
- 11/28/84, Rice University, Houston, Texas
- 4/26/85, University of Alabama, University, Alabama
- 4/30/85, University of North Carolina at Charlotte Charlotte, North Carolina
- 6/6/85, AIT-CNNAA Joint Differential Equation Seminar, Taiwan
- 6/11/85 Invited touring lectures at 12 institutions in the People's  
-7/22/85, Republic of China
- 2/6/86, University of Chicago, Chicago, Illinois
- 2/7/86, Fermi Lab., Chicago, Illinois
- 2/25/86, North Carolina State University, Raleigh, North Carolina
- 2/28/86, George Mason University, Fairfax, Virginia
- 3/6/86, University of Maryland, College Park, Maryland
- 4/7/86, Ohio University, Athens, Ohio
- 4/14/86, Operations Research Society of America Meeting,  
Los Angeles, California
- 4/15/86, University of California, San Diego, California
- 8/12/86, ISFE 24 (International Symposium on Functional Equations 24),  
Mount Holyoke College, South Hadley, Massachusetts
- 10/1/86, University of Michigan, Ann Arbor, Michigan
- 10/8/86, University of Utah, Salt Lake City, Utah
- 10/11/86, AMS 828<sup>th</sup> meeting, Logan, Utah
- 11/1/86, AMS 830<sup>th</sup> meeting, Denton, Texas
- 2/5/87, Central Michigan University, Mt. Pleasant, Michigan
- 7/12/87 Invited by the State Commission of Education of China  
-8/16/87, to give a series of lectures in the 4<sup>th</sup> Program  
of the Summer School for the Postgraduate of Mathematics,  
Jilin University, China
- 10/3/87, Japan Mathematical Society 1987 Annual meeting Kyoto, Japan
- 1/1/88 Invited by a number of universities in Japan to give  
-6/30/88, colloquium talks. The list of the universities includes

University of Tokyo, Kyoto University, University of Tsakuba, Kyushu University, Osaka University, Nagoya University, Kobe University, Ehie University, and Mie University

- 8/30/88, The 13<sup>th</sup> International Symposium on Mathematical Programming, Tokyo, Japan
- 11/17/88, Adrian College, Adrian, Michigan
- 12/14/88, University of Maryland, College Park, Maryland
- 12/19/88, Courant Institute of Mathematical Science, New York University, New York, New York
- 1/17/89, Argonne National Laboratory, Argonne, Illinois
- 1/29/90, Clemson University, Clemson, South Carolina
- 1/30/90, North Carolina State University, Raleigh, North Carolina
- 2/1/90, George Mason University, Fairfax, Virginia
- 2/8/90, University of Maryland, College Park, Maryland
- 4/2/90, Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado
- 5/8/90, Operations Research Society of America National Meeting, Las Vegas, Nevada
- 5/17/90, Interface 90's, Kellogg Center, E. Lansing, Michigan
- 5/23/90, Nonlinear Science: The Next Decade, Los Alamos, New Mexico
- 6/17/90 -6/23/90, Third Czechoslovak Summer School on Dynamical Systems, Stará Turá, Czechoslovakia
- 1/9/91, University of Toledo, Toledo, Ohio
- 5/22/91 -6/11/91, Invited by Nankai Institute of Mathematics, Tianjin, China to give a series of lectures for the Program in Dynamical System, along with colloquium talks at several institutions. The list of the institutions includes Peking University, Tsing Hua University, Fuzhou University and the Institute of Systems Sciences, Academia Sinica
- 10/11/91, Western Michigan University, Kalamazoo, Michigan
- 2/13/92, IMA University of Minnesota, Minneapolis, Minnesota
- 7/16/92 International Workshop on Mathematics Mechanization, Beijing, China
- 7/18/92, -7/18/92, World Congress of Nonlinear Analysts, Melbourne, Florida
- 8/19/92 -8/26/92, Florida
- 12/3/92, Central Michigan University, Mt. Pleasant, Michigan
- 7/5/93 International Workshop on Linear & Nonlinear Iterative Method, Matsuyama, Japan
- 7/9/93, -7/9/93, Japan
- 10/4/93 International Workshop on Continuous Algorithms

- 10/6/93, and Complexity, Barcelona, Spain
- 5/11/94, Instituto De Matematica Pura E Aplicada, Rio de Janeiro, Brazil
- 6/12/94 AMS 1994 Summer Research Conference, Mount Holyoke College, South Hadley, Massachusetts
- -6/16/94, College, South Hadley, Massachusetts
- 11/9/94, IBM Watson Research Center, York Town Heights, New York
- 3/7/95, University of Southern Mississippi, Hattisburg, Mississippi
- 3/10/95 West Florida University, Pensacola, Florida
- 3/29/95, The 26th Annual Iranian Mathematics Conference, Kerman, IRAN
- 8/1/95, The 25th AMS-SIAM Summer Seminar in Applied Mathematics, Park City, Utah
- 11/6/95, Seminar on Real Computation and Complexity, Schloß Dagstuhl, Germany
- 11/14/95, International Workshop on System of Algebraic Equations, CIRM Marseilles, France
- 5/7/96, Katholieke Universiteit Leuven, Leuven, Belgium
- 6/17/96, '96 Beijing Dynamical Systems Conference, Beijing, China
- 6/19/96, Tsing Hua University, Beijing, China
- 6/26/96, Peking University, Beijing, China
- 7/26/96, Academia Sinica, Taipei, Taiwan
- 1/11/97, Foundations of Computational Mathematics Conference, Rio de Janeiro, Brazil
- 3/7/97, Stanford University, Stanford, California
- 3/10/97, Caltech, Pasadena, California
- 3/11/97, UCLA, Los Angels, California
- 4/10/97, University of Maryland, College Park, Maryland
- 4/11/97, George Mason University, Fairfax, Virginia
- 7/16/97, Institute of System Sciences, Academia Sinica, Beijing, China
- 8/12/97, Peking University, Beijing, China
- 12/12/97, University of Central Arkansas, Conway, Arkansas
- 4/4/98, AMS 933rd Meeting, Philadelphia, Pennsylvania
- 8/17/98 Delivered 4 talks in Introductory Workshop on Foundation of Computational Mathematics and Symbolic Computation in Geometry and Analysis, MSRI, Berkeley, California
- -8/26/98, MSRI, Berkeley, California
- 9/15/98, Workshop on Solving Systems of Equations, MSRI, Berkeley, California
- 3/31/99, University of Notre Dame, Notre Dame, Indiana
- 8/2/99, Foundation of Computational Mathematics Conference, Oxford, England
- 1/10/00 Distinguished Lecture Series(3 talks), National Tsing-Hua University, Taiwan
- -1/12/00, Taiwan
- 2/14/00 Lecture series (4 hrs talks), Caltech, Pasadena, California
- -2/18/00, California
- 7/5/00, Tokyo Institute of Technology, Tokyo, Japan

- 7/17/00, International Conference on Foundation of Computational Mathematics in honor of Professor Steve Smale's 70<sup>th</sup> Birthday, Hong Kong
- 10/9/00, International Workshop on Chaos & Nonlinear Dynamics, Asuka, Japan
- 10/27/00, Sino-Japan Joint Optimization Meeting, Hong Kong
- 1/4/01, Pacific Rim Conference on Mathematics, Taipei, Taiwan
- 1/8/01, National Taiwan University, Taipei, Taiwan
- 4/28/01, Tsing Hua University, Beijing, China
- 10/26/01, University of Michigan, Ann Arbor, Michigan
- 12/21/01, ICCM 2001, Taipei, Taiwan
- 4/30/02, Tamkang University, Taipei, Taiwan
- 5/1/02, National Tsing Hua University, Taiwan
- 5/20/02, CBMS "Solving Polynomial System", Texas A&M University, College Station, Texas
- 8/14/02, Foundation of Computational Mathematics Conference, University of Minnesota, Minneapolis, Minnesota
- 4/24/03, University of Kentucky, Lexington, Kentucky
- 5/13/03, Center for Advanced Study, Oslo, Norway
- 8/18/03, "Shub Fest" (in honor of Professor Mike Shub's 60th birthday), University of California, Berkeley
- 10/15/03, University of Illinois at Chicago Circle, Chicago, Illinois
- 11/18/03, University of Notre Dame, Notre Dame, Indiana
- 10/23/04, AMS meeting #1001, Evanston, Illinois
- 3/4/05, University of Missouri, Kansas City, Missouri
- 3/9/05, University of Southern Mississippi, Hattisburg, Mississippi
- 3/10/05, University of Southern Alabama, Mobile, Alabama
- 3/11/05, West Florida University, Pensacola, Florida
- 4/7/05, Brigham Young University, Provo, Utah
- 8/9/05, Workshop on Geometry and Symmetry in Numerical Computation, Colorado State University, Fort Collins, Colorado
- 10/10/05, Midwest Algebra, Geometry and their Interactions Conference (MAGIC 05), University of Notre Dame, Notre Dame, Indiana
- 12/5/05  
-12/26/05, Lecture Series(8 talks), National Center for Theoretical Sciences, National Tsing-Hua University, Taiwan
- 12/22/05, National University of Kaohsiung, Kaohsiung, Taiwan
- 4/3/06, Georgia Tech, Atlanta, Georgia
- 4/8/06, AMS meeting #1016, Notre Dame, Indiana
- 6/5/06, The International Conference on Nonlinear and Stochastic Dynamics, Chengdu, China
- 6/12/06, East China Normal University, Shanghai, China
- 9/21/06, Algorithms in Algebraic Geometry Workshop, IMA, University of Minnesota, Minneapolis, Minnesota
- 2/16/07, Texas A&M University, College Station, Texas

- 4/20/07, Workshop on Advances in Optimization, Tokyo, Japan
- 7/31/07, Hunan Normal University, Changsha, Hunan, China
- 8/6/07 Lecture Series (8 talks), Dalian University of Technology,  
-8/22/07, Dalian, China
- 8/29/07, National Tsing-Hua University, Taiwan
- 8/30/07, Academia Sinica, Taipei, Taiwan
- 10/6/07, AMS meeting #1030, DePaul University, Chicago, Illinois
- 11/7/07, University of Toronto, Toronto, Ontario, Canada
- 5/23/08, Interactions of Classical & Numerical Algebraic Geometry,  
Notre Dame, Indiana
- 8/26/08, National Tsing-Hua University, Taiwan
- 8/29/08, The 4th Sino-Japanese Joint Optimization Meeting, Tainan, Taiwan
- 3/13/09, Purdue University, West Lafayette, Indiana
- 5/12/09, Interdisciplinary Conference on Applied Analysis and Mathematics,  
Hsinchu, Taiwan
- 9/29/09, Fields Institute, University of Toronto, Toronto, Ontario, Canada
- 10/9/09, Maplesoft, Waterloo, Ontario, Canada

### **Theses Directed**

Moody Chu, Ph.D., 1982

Dissertation: A nonlinear multistep method for solving stiff initial value problems

Mahmoud Mohseni, Ph.D., 1984

Dissertation: Homotopy continuation method for nonlinear equations

Henry Gee, Ph.D., 1985

Dissertation: A model for the correction of the geometric distortion  
of multispectral scanner data

Noah Rhee, Ph.D., 1987

Dissertation: The homotopy method for the symmetric eigenvalue problems

Hong Zhang Sun, Ph.D., 1989

Dissertation: On the Galerkin method with vector basis functions

Jiu Ding, Ph.D., 1990

Dissertation: Finite approximations of the Frobenius-Perron operator

Xiaoshen Wang, Ph.D., 1990

Dissertation: Homotopy methods for solving deficient polynomial systems

Kuiyuan Li, Ph.D., 1991

Dissertation: Homotopy methods and algorithms for real symmetric eigenproblems

Zhonggang Zeng, Ph.D., 1991

- Dissertation: Homotopy-determinant method for matrix eigenvalue problems and its parallelization
- Liang Jiao Huang, Ph.D., 1992  
Dissertation: Parallel homotopy algorithm for large sparse symmetric eigenproblems
- Ming Jin, Ph.D., 1995  
Dissertation: Quasi-Laguerre iteration and its application in solving symmetric tridiagonal eigenvalue problems
- Xiulin Zou, Ph.D., 1995  
Dissertation: Quasi-Laguerre's method and its parallel implementation in solving symmetric tridiagonal eigenvalue problems
- Xiaozhuo Yang, Ph.D., 1996  
Dissertation: A scalable algorithm for non-symmetric eigenvalue problems
- Yingjie Zhang, Ph.D., 1996  
Dissertation: Hausdorff dimension of invariant sets for expanding and hyperbolic systems
- Qingchuan Yao, Ph.D., 1998  
Dissertation: Convergence of several iterative methods
- Hwee Hoon Chung, Ph.D., 1998  
Dissertation: Polyhedral homotopy and its applications to polynomial system solving
- Tangan Gao, Ph.D., 1999  
Dissertation: Finding all isolated roots of polynomial systems in  $C^n$  via stable mixed volume
- Tianjun Wang, Ph.D., 1999  
Dissertation: Determining the Jordan normal form of a matrix
- Xing Li, Ph.D., 2000  
Dissertation: Solving polynomial systems in  $C^n$  by polyhedral homotopies
- Mengnien Wu, Ph.D., 2000  
Dissertation: Balancing lifting values to improve numerical stability of polyhedral homotopy methods
- Tsung-Lin Lee, Ph.D., 2007  
Dissertation: A rank-revealing method for low rank matrices with updating, downdating, and applications
- Chih-Hsiung Tsai, Ph.D., 2008  
Dissertation: Algorithms for solving polynomial systems by homotopy continuation method, and its parallelization
- Ying Zhang, Ph.D., 2008  
Dissertation: Total degree and mixed volume



### Research Grant Awards:

- NSF MPS 74-24310 Qualitative behavior for generalized dynamical processes  
(7/1/75 – 12/31/76)
- NSF MCS 76-24432 Chaotic behavior of dynamical systems  
(7/1/76 – 12/31/78)
- NSF MCS 78-18221 Generalized dynamical processes  
(7/15/78 – 11/30/80)
- NSF MCS 80-02994 Numerical solutions of systems of nonlinear equations  
(7/1/80 – 12/31/82)
- NSF MCS 83-01408 Numerical solutions of nonlinear equations by the  
continuation method – (7/1/83 – 12/31/85)
- NSF DMS 84-16503 Statistical stability of dynamical system  
(7/1/85 – 12/31/87)
- NSF DMS 87-01349 Numerical solutions of polynomial systems  
(8/1/87 – 1/31/90)
- NSF DMS 89-02663 Homotopy continuation methods for deficient  
polynomial systems – (7/1/89 – 12/31/91)
- NSF CCR 90-24840 A continuation approach to eigenvalue problems  
(8/1/91 – 1/31/95)
- NSF DMS 95-04953 Homotopy algorithms for solving sparse polynomial  
systems – (7/15/95 – 6/30/98)
- NSF DMS 98-04846 Solving sparse polynomial systems by polyhedral  
homotopies – (7/15/98 – 6/30/01)
- NSF DMS 01-04009 Solving polynomial systems by polyhedral homotopies  
(8/1/01 – 7/31/04)
- NSF DMS 04-11165 Solving polynomial systems by polyhedral homotopies  
(10/1/04 – 9/30/07)
- NSF DMS 08-11172 Solving polynomial systems by polyhedral homotopies  
(7/1/08 – 6/30/11)

## Publication

- “Existence of solutions for ordinary differential equation in Banach spaces,” *J. Differential Equations*, Vol. 18, (1975), No. 1, pp. 29-40.
- “Bounds for the periods of periodic solutions of differential delay equations,” *J. Math. Anal. Appl.*, Vol. 49, (1975), pp. 124-129.
- “Period three implies chaos” (with J.A. Yorke), *Amer. Math. Monthly*, Vol. 82, (1975), No. 10, pp. 985-992.
- “The simplest dynamical system” (with J.A. Yorke), *Dynamical Systems*, Academic Press, New York (1976), pp. 203-206.
- “Finite approximation for the Frobenius-Perron operator — A solution to Ulam’s conjecture,” *J. Approximation Theory*, 17 (1976), pp. 177-186.
- “A constructive proof of the Brouwer fixed point theorem and computational results” (with R. B. Kellogg and J.A. Yorke), *SIAM J. Numer. Anal.*, 13 (1976), pp. 473-483.
- “The numerical solution of Hilbert problem” (with Y. Ikebe and F. Stenger), *Theory of Approximation with Applications*, Academic Press, New York (1976), pp. 338-358.
- “Computing the Brouwer fixed point by following the continuation curve,” *Fixed Point Theory and Its Applications*, Academic Press, New York (1976), pp. 131-135.
- “A method of continuation for calculating a Brouwer fixed point” (with R. B. Kellogg and J.A. Yorke), *Fixed points, algorithms and applications*, S. Kararmardien ed., Academic Press, New York (1977), pp. 133-147.
- “Ergodic transformations from an interval into itself,” *Trans. Amer. Math. Soc.*, Vol. 235 (1978), pp. 183-192.
- “Ergodic maps on  $[0, 1]$  and nonlinear pseudo-random number generators” (with J.A. Yorke), *J. of Nonlinear Analysis*, Vol. 2, No. 4 (1978), pp. 473-481.
- “The generalized Boole’s transformation is ergodic” (with F. Schweiger), *Manuscripta Mathematica*, 25 (1978), pp. 161-167.
- “The elliptic porous slider — A homotopy method” (with L. Watson and C.Y. Wang), *J. of Applied Mechanics*, Vol. 45, No. 2 (1978), pp. 435-436.

- “Path following approaches for solving nonlinear equations: homotopy, continuous Newton and projection” (with J.A. Yorke), *Functional differential equations and approximation of fixed points*, (1978) pp. 257-261.
- “On the number of solutions to polynomial systems of equations” (with C.B. Garcia), *SIAM J. Numer. Anal.*, Vol. 17 (1980), pp. 540-546.
- “A simple reliable numerical algorithm for following homotopy paths” (with J.A. Yorke), *Analysis and Computation of Fixed Points*, Academic Press (1980), pp. 73-91.
- “On a path following method for systems of equations” (with C.B. Garcia), *Bull. Inst. Math. Acad. Sinica*, Vol. 9, No. 2 (1981), pp. 249-259.
- “Odd chaos” (with M. Misiurewicz, G. Pianigiani and J.A. Yorke), *Physics Letter A*, vol. 87A, No. 6 (1982), pp. 271-273.
- “No division implies chaos” (with M. Misiurewicz, G. Pianigiani and J.A. Yorke), *Trans. Amer. Math. Soc.*, Vol. 273 (1982), pp. 191-199.
- “Piecewise smooth continuation” (with J.C. Alexander and J.A. Yorke), *Homotopy methods and global convergence*, Plenum Pub. Co. (1983), pp. 1-14.
- “Iterating piecewise expanding maps: Asymptotic dynamics of probability densities” (with J.A. Yorke).
- “On locating all the zeros of an analytic function within a bounded domain by a revised Relves/Lyness method,” *SIAM J. Numer. Anal.*, Vol. 20, No. 4 (1983), pp. 865-871.
- “On Chow, Mallet-Paret and Yorke homotopy for solving system of polynomials,” *Bull. Inst. Math. Acad. Sinica*, Vol. 11, No. 3, (1983), pp. 433-437.
- “Asymptotic periodicity of the iterates of Markov operators,” *Trans. Amer. Math. Soc.*, Vol. 186, No. 2 (1984), pp. 751-764.
- “Regularity results for real analytic homotopies” (with J. Mallet-Paret and J.A. Yorke), *Numer. Math.*, 46, (1985), pp. 43-50.
- “Regularity results for solving systems of polynomials by homotopy method” (with T. Sauer), *Numer. Math.*, 50, (1987), pp. 283-289.
- “Numerical solution of a class of deficient polynomial systems” (with T. Sauer and J.A. Yorke), *SIAM J. Numer. Anal.*, Vol. 24, No. 2 (1987), pp. 435-451.
- “Homotopy method for generalized eigenvalue problems  $Ax = \lambda Bx$ ” (with T. Sauer), *Linear Alg. Appl.*, Vol. 91 (1987), pp. 65-74.

- “Solving polynomial systems,” *Mathematical Intelligencer*, Vol. 9, No. 3 (1987), pp. 33-39.
- “The random product homotopy and deficient polynomial systems” (with T. Sauer and J.A. Yorke), *Numer. Math.*, 51, (1987), pp. 481-500.
- “Homotopy algorithm for symmetric eigenvalue problems” (with N. Rhee), *North-eastern Math. J.*, 3(4), (1987), pp. 379-383.
- “Homotopy method for general  $\lambda$ -matrix problems” (with M. Chu and T. Sauer), *SIAM J. Matrix Anal. and Appl.*, Vol. 9, No. 4 (1988), pp. 528-536.
- “Numerically determining solutions of systems of polynomial equations” (with T. Sauer and J.A. Yorke), *A.M.S. Bull.*, Vol. 18, No. 2 (1988), pp. 173-177.
- “Consequences of the Li-Yorke theorem on chaos,” (in Japanese) *Sugaku Seminar*, Vol. 27, No. 10 (1988), pp. 44-47.
- “Solving all the isolated zeros of polynomial systems,” (in Chinese) *Advances in Math.*, Vol. 17, No. 3 (1988), pp. 260-266.
- “The cheater’s homotopy: An efficient procedure for solving systems of polynomial equations” (with T. Sauer and J.A. Yorke), *SIAM J. Numer. Anal.*, Vol. 26, No. 5 (1989), pp. 1241-1251.
- “Homotopy algorithm for symmetric eigenvalue problems” (with N. Rhee), *Numer. Math.*, 55 (1989), pp. 265-280.
- “A simple homotopy for solving deficient polynomial systems” (with T. Sauer), *Japan J. Appl. Math.*, 6 (1989), pp. 409-419.
- “Entropy,” (in Chinese) *Advances in Math.*, Vol. 19, No. 3 (1990), pp. 301-320.
- “A homotopy for solving the kinematics of the most general six-and-five-degree of freedom manipulators” (with X. Wang), *Proc. of ASME Conference on Mechanisms*, D1 - Vol.25 (1990), pp. 249-252.
- “An algorithm based on weighted logarithmic barrier functions for linear complementarity problems” (with Jiu Ding), *Arabian J. Sci. Eng.*, Vol. 15, No. 4B (1990), pp. 679-685.
- “A polynomial-time predictor-corrector algorithm for linear complementarity problem” (with Jiu Ding), *SIAM J. Optimization*, Vol.1, No.1 (1991), pp. 83-92.
- “Parallel homotopy algorithm for symmetric tridiagonal eigenvalue problem” (with H. Zhang and X.H. Sun), *SIAM J. Sci. Stat. Comput.*, Vol. 12, No. 3 (1991), pp. 469-487.

- “Solving deficient polynomial systems with homotopies which keep the subschemes at infinity invariant” (with X. Wang), *Math. Comp.*, Vol. 56, No. 194 (1991), pp. 693-710.
- “Markov finite approximation of Frobenius-Perron operator” (with J. Ding), *J. Nonlinear Anal., Theory, Methods & Applications*, Vol. 17, No. 8 (1991), pp. 759-772.
- “Solving eigenvalue problems of real nonsymmetric matrices with real homotopies” (with Z. Zeng and L. Cong), *SIAM J. Numer. Anal.*, Vol. 29, No. 1 (1992), pp. 229-248.
- “Nonlinear homotopies for solving deficient polynomial system with parameters” (with X. Wang), *SIAM J. Numer. Anal.*, Vol. 29, No. 4 (1992), pp. 1104-1118.
- “Error estimates of the Markov finite approximation of the Frobenius-Perron operator” (with C. Chiu and Q. Du), *J. Nonlinear Anal., Theory, Methods & Applications*, Vol. 19, No. 4 (1992), pp. 291-308.
- “Homotopy-determinant algorithm for solving nonsymmetric eigenvalue problems” (with Z. Zeng), *Math. Comp.*, Vol. 59, No. 200 (1992), pp. 483-502.
- “Projection solutions of Frobenius-Perron Operator Equations” (with Jiu Ding), *International J. of Math. & Math. Sci.*, Vol. 16, No. 3 (1993), pp. 465-484.
- “An algorithm for symmetric tridiagonal eigen-problems - divide and conquer with homotopy continuation” (with K. Li), *SIAM J. Sci. Comput.*, Vol. 14, No. 3 (1993), pp. 735-751.
- “A homotopy algorithm for a symmetric generalized eigenproblem” (with K. Li), *Numerical Algorithm*, 4 (1993), pp. 167-195.
- “Solving real polynomial systems with real homotopies” (with X. Wang), *Math Comp.*, Vol. 60, No. 202 (1993), pp. 669-680.
- “High order approximation of the Frobenius-Perron operator” (with J. Ding and Q. Du), *Appl. Math. Comput.*, 53 (1993), pp. 157-171.
- “Entropy - An introduction” (with J. Ding), *Nankai Ser. Pure, Appl. Math. Theoret. Phys.*, 4, World Sci. Publishing, River Edge, NJ, (1993), pp. 26-54.
- “Solving polynomial systems by homotopy continuation methods”, *Computer Mathematics, Nankai Ser. Pure, Appl. Math, Theoret. Phys.*, 5, World Sci. Publishing, River Edge, NJ, (1993), pp. 18-35.

- “Laguerre’s iteration in solving the symmetric tridiagonal eigenproblem – Revisited” (with Z. Zeng), *SIAM J. Sci. Comput.*, Vol. 15 , No. 5 (1994), pp. 1445-1473.
- “Homotopy method for the singular symmetric tridiagonal eigenproblem” (with K. Li), *Missouri J. Math. Sci.*, Vol. 6, No. 1, (1994) pp. 34-46.
- “The spectral analysis of Frobenius-Perron operators” (with J. Ding and Q. Du), *J. Math. Anal. Appl.*, Vol. 184, No. 2, (1994) pp. 285-301.
- “Higher order turning points” (with X. Wang), *Appl. Math. & Comput.*, Vol. 64, No. 2, (1994) pp. 155-166.
- “An algorithm for the generalized symmetric tridiagonal eigenproblem” with K. Li and Z. Zeng), *Numerical Algorithm*, Vol. 8, No. 3, (1994) pp. 269-291.
- “An efficient and accurate parallel algorithm for the singular value problem of bidiagonal matrices” (with N. Rhee and Z. Zeng), *Numer. Math.*, Vol. 69, (1995) pp. 283-301.
- “A scalable eigenvalue solver for symmetric tridiagonal matrices”(with C. Trefftz, P. McKinley and Z. Zeng), *Parallel Computing*, 21 (1995) pp. 1213-1240.
- “Parallel homotopy algorithm for symmetric large sparse eigenproblems” (with L. Huang), *J. Comput. & Appl. Math.*, 60 (1995) pp. 77-100.
- “Lyapunov iterations for solving coupled algebraic Riccati equations for Nash differential games and algebraic Riccati equation of zero-sum games” (with Z. Gajic), G. J. Olsder ed., *New Trends in Dynamic Games and Applications*, Annals of the International Society of Dynamic Games, Vol. 3, Birkhauser, (1995) pp. 333-351.
- “The *BKK* root count in  $C^n$ ” (with X. Wang), *Math. Comp.* Vol. 65, No. 216, (1996) pp. 1477-1484.
- “Quasi-Laguerre iteration in solving symmetric tridiagonal eigenvalue problems”(with Q. Du, M. Jin and Z. Zeng), *SIAM J. Sci. Comput.* Vol. 17, No. 6, (1996) pp. 1347-1368.
- “Random product homotopy with minimal *BKK* bound”(with T. Wang and X. Wang), J. Renegar, M. Shub and S. Smale ed., *The Mathematics of Numerical Analysis*, A. M. S., (1996) pp. 503-512.
- “Determining the structure of the Jordan normal form of a matrix by symbolic computation”(with Z. Zhang and T. Wang), *Linear Alg. Appl.*, Vol. 252, (1997) pp. 221-259.

- “The Quasi-Laguerre iteration” (with Q. Du, M. Jin and Z. Zeng), *Math. Comp.*, Vol. 66, No. 217, (1997) pp. 345-361.
- “Numerical solution of multivariate polynomial systems by homotopy continuation methods”, *Acta Numerica* (1997), pp. 399-436.
- “A parallel method for the banded eigenvalue problem”, *AJSE*, Vol. 22, No. 2c, (1997), pp. 31 - 40.
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