

May, 2009

## CURRICULUM VITAE

Harvey Thomas Banks  
Distinguished University Professor  
and  
Drexel Professor of Mathematics  
Center for Research in Scientific Computation  
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**Born**                   October 30, 1940  
Hickory, North Carolina

**Home Address**   202 Birkhaven Dr.  
Cary, NC 27518

**Education**           1963 B.S. Applied Mathematics, North Carolina State  
University  
1965 M.S. Applied Mathematics, Purdue University  
1967 PhD Applied Mathematics, Purdue University

### **Faculty Research Interests**

Optimization and control theory, including deterministic and statistical methods for identification and control of partial and functional differential equations, applications to problems in electromagnetics, elasticity, acoustics, smart materials and structures.

Mathematical models in biology, including physiologically based pharmacokinetic (PBPK) models; diffusion and transport phenomena in membranes, tissue, population dispersal and growth, size structured populations, infectious diseases.

Scientific computing, including parallel architectures, vector and array processors; architecture/software/approximation method interface in control and estimation techniques; uncertainty and probabilistic methods

## Professional Appointments

1967-68	Research Associate, Division of Applied Mathematics, Brown University, Providence, RI
1968-72	Assistant Professor, Division of Applied Mathematics, Brown University, Providence, RI
1972 May-June	Visiting Scientist, IRIA (Institut de Recherche d'Informatique et d'Automatique) Rocquencourt, France
1972-76	Associate Professor, Division of Applied Mathematics, Brown University, Providence, RI
1975-76	Visiting Associate Professor, Department of Mathematics, University of Colorado
1977-91	Professor, Division of Applied Mathematics, Brown University, Providence, RI
1977-82	Professor Visiteur (Adjunct Professor), Universite de Technologie de Compiegne, Compiegne, France
1978-	July, Visiting Professor, Universitat Graz. Graz. Austria
7/79-6/80	Associate Director, Lefschetz Center for Dynamical Systems, Brown University
6/80-8/80	Director, Lefschetz Center for Dynamical Systems, Brown University
6/80-12/03	Scientific Consultant, Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research Center, Hampton, VA
3/85-9/93	Associate Member, ICASE
7/81-8/81	Visiting Professor, University of Utah, Salt Lake City, Utah
9/81-12/81	Acting Director, Lefschetz Center for Dynamical Systems, Brown University, Providence, RI

- 9/82-6/84 Visiting Professor, Southern Methodist University,  
Dallas, TX
- 9/82-3/84 Scientific Consultant, Mobile Oil Co.,  
Dallas, TX
- 1/87-8/89 Director, Center for Control Sciences,  
Brown University
- 6/88 Professeur, Universite de Paris, IX (Dauphine)
- 9/89-8/92 Professor of Mathematics and Founding Director  
Center for Applied Mathematical Sciences  
University of Southern California
- 1/92- University Professor and Drexel Professor of Mathematics  
Director, Center for Research in Scientific Computation  
N.C. State University
- 3/94, 5/94 Professeur Visiteur, Universite de Pierre et Marie Curie,  
Paris VI, and College de France
- 5/96 Professeur Visiteur, Universite de Frenche Compte, Bescanson, France
- 3/98 Professeur Invité, Centre Émile Borel, Institut Henri Poincaré,  
Paris, France
- 5/00- Alumni Distinguished Graduate Professor, N.C. State University
- 3/01, 4/01 Professeur Visiteur, Universite de Pierre et Marie Curie,  
Paris VI, Paris, France
- 6/00-6/05 Member of Founding Directorate, Statistical and Applied  
Mathematical Sciences Institute (SAMSI), Research Triangle Park, NC
- 6/02-6/05 Associate Director for Education and Outreach, Statistical and Applied  
Mathematical Sciences Institute (SAMSI), Research Triangle Park, NC
- 2/04-3/04 Professeur Invité, Universite de Pierre et Marie Curie,  
Paris VI, Paris, France

1/07– Distinguished University Professor, N.C. State University

10/07– Co-Director, Center for Quantitative Sciences in Biomedicine,  
N.C. State University

## Books written and edited by H.T. Banks

1. H.T. Banks, *Modeling and Control in the Biomedical Sciences*, Lecture Notes in Biomathematics, **6** Heidelberg, Springer, 1975.
2. H.T. Banks and K. Kunisch, *Estimation Techniques for Distributed Parameter Systems*, Boston:Birkhäuser, 1989, 320pp.
3. H.T. Banks, ed. *Control and Estimation in Distributed Parameter Systems*, (Frontiers in Applied Mathematics **11**), Philadelphia, SIAM, 1992.
4. H.T. Banks, R.H. Fabiano and K. Ito, eds. *Identification and Control in Systems Governed by Partial Differential Equations*, Philadelphia, SIAM, 1993.
5. H.T. Banks, R.C. Smith and Y. Wang, *Smart Material Structures: Modeling, Estimation and Control*, Masson Series on Research in Applied Math, Masson/J. Wiley, 1996.
6. H.T. Banks, M.W. Buksas and T. Lin, *Electromagnetic Material Interrogation Using Conductive Interfaces and Acoustic Wavefronts*, (Frontiers in Applied Mathematics **21**), Philadelphia, SIAM, 2000.
7. H.T. Banks and C. Castillo-Chavez, eds. *Bioterrorism, Mathematical Modeling Applications in Homeland Security*. (Frontiers in Applied Mathematics **28**), Philadelphia, SIAM, 2003.
8. H.T. Banks and H.T. Tran, *Mathematical and Experimental Modeling of Physical and Biological Processes*, CRC Press, Boca Raton, FL, July, 2008, 308pp. Published, January, 2009.

## Publications

1. Necessary conditions for control problems with variable time lags, SIAM J. Control, 6 (1968), 9-47.
2. Variational problems involving functional differential equations, SIAM J. Control, 7 (1969), 1-17.
3. Representations for solutions of linear functional differential equations, J. Differential Equations, 5 (1969), 399-409.
4. A maximum principle for optimal control problems with functional differential systems, Bull. Amer. Math. Soc., 75 (1969), 158-161.
5. Invariance in linear systems (with J.K. Aggarwal, Univ. of Texas, and N.H. McClamroch, Univ. of Michigan), Biannual Electrical Research, 8 (1968), Electronics Research Center, Univ. of Texas, Austin, Texas. Also appeared in J. Math. Anal. Appl., 29 (1970), 498-506.
6. Optimal control of linear time delay systems (with J.K. Aggarwal and D.H. Eller), IEEE Trans. Automatic Control, AC-14 (1969), 678-687.
7. A differential calculus for multifunctions (with M.Q. Jacobs), J. Math. Anal. Appl., 29 (1970), 246-272.
8. The optimization of trajectories of linear functional differential equations (with M.Q. Jacobs), SIAM J. Control, 8 (1970), 461-488.
9. Optimal control and linear functional differential equations (with M.Q. Jacobs), in *Proc. of the Conf. on Differential Equations and Dynamical Systems*, Univ. of Maryland, August 1969: Springer-Verlag Lecture Notes in Mathematics, 144 (1970), 5-15.
10. The synthesis of time-optimal controls for linear problems with retarded controls (with M.Q. Jacobs and M.R. Latina), J. Optimization Theory Appl., 8(1971), 319-366.
11. Control of functional differential equations of retarded and neutral type to target sets in function space (with G.A. Kent), SIAM J. Control, 10 (1972), 567-593.
12. Convergence theorems for parameter estimation by quasilinearization (with G.M. Groome, Jr.), J. Math. Anal. Appl., 42 (1973), 91-109.
13. An attainable sets approach to optimal control of functional differential equations with function space terminal conditions (with M.Q. Jacobs), J. Differential Equations, 13 (1973), 127-149.

14. Control of functional differential equations with function space boundary conditions, in *Delay and Functional Differential Equations and their Applications*, K. Skittle, Ed., Academic Press, New York, (1972), 1-16.
15. IRIA lectures in *Seminaires IRIA: Analyse et Controle de Systemes*, Rocquencourt, France, 1972. a. Glucose homeostasis I. Physiological background and a survey of some previous mathematical models, 15-20. b. Glucose homeostasis II. A new mathematical model, 21-31. c. On identification problems arising in biomedical modeling, 33-37. d. A survey of results on control of systems with delays, 39-44.
16. Mathematical modeling of the glucose homeostatis system in humans (with C.A. Carter), LCDS Lecture Notes 72-1, Brown University, July 1972.
17. Projection series for retarded functional differential equations with applications to optimal control problems (with A. Manitius), *J. Differential Equations*, 18 (1975), 296-332.
18. Function space controllability for linear functional differential equations (with M.Q. Jacobs and C. Langenhop), in *Differential Games and Control Theory*, R. Sternberg Ed., Marcel Dekker, New York (1974), 81-98.
19. Characterization of controlled states in  $W_2^{(1)}$  of linear hereditary systems (with M.Q. Jacobs and C. Langenhop), *SIAM J. Control*, 13 (1975), 611-649.
20. Modeling and control of dynamical systems in the life sciences, LCDS Lecture Notes 73-1, Brown University, November 1973 (also appeared in *Proc. 14th Biennial Seminar of the Canadian Math. Congress*, London, Ontario, August, 1973).
21. Application of the Fredholm alternative to controllability of functional differential equations (with M.Q. Jacobs and C. Langenhop), *Proc. 14th Biennial Seminar of the Canadian Math. Congress*, (1973).
22. Application of abstract variational theory to hereditary systems - a survey (with A. Manitius), Univ. of Minnesota Report TR-73-11, October, 1973; *IEEE Trans. Automatic Control*, AC-19 (1974), 524-533.
23. A mathematical model for enzyme cascades (with R. Miech), *Proc. 1973 Intl. Conf. on Cybernetics and Society*, Boston, MA, (1973), 236-239.
24. Projection methods for retarded functional differential equations (with A. Manitius) in *Mathematical Control Theory*, (S. Dolecki C. Olech, and J. Jabczyk, Eds.), Banach Center Publications, 1, Warsaw (1976), 9-15.
25. Kinetics of a cyclic-AMP initiated recycling cascade for the activation of phosphorylase (with R. Miech), to appear.

26. Mathematical models for enzyme cascades (with R. Miech), *Seminares IRIA: Analyse et controle de Systemes*, Rocquencourt, France (1974), 5-13.
27. Nonlinear systems in models for enzyme cascades (with R. Miech and D. Zinberg) in *Variable Structure Systems with Application to Economics and Biology*, (A. Ruberti and R. Mohler, Eds), *Lecture Notes in Econ. and Math. Systems*, 111 Springer (1975), 265-277.
28. Projection methods for hereditary systems (with J. Burns), in *International Symposium on Dynamical Systems* (L. Cesari, J. Hale, J. LaSalle, Eds.), Academic Press (1975), 287-190.
29. An abstract framework for approximate solutions to optimal control problems governed by hereditary systems (with J. Burns), *International Conference on Differential Equations* (H. Antosiewicz, Ed.), Academic Press (1975), 10-25.
30. Eigenmanifold decomposition for retarded functional differential equations in Hilbert space (with J. Burns), *Tech. Rep. No. TR-1*, Math. Dept. VPISU, Blacksburg, November 1974.
31. A theoretical and computational method for determining optimal treatment schedules in fractionated radiation therapy (with K. Almquist), *Math. Biosci.*, 29 (1976), 159-179.
32. *Mathematical Modeling in the Biological Sciences* (with P.J. Palatt), LCDS Lecture Notes 75-1, July 1975.
33. *Modeling and Control in the Biomedical Sciences*, *Lecture Notes in Biomathematics*, 6 Springer, Heidelberg, 1975.
34. Numerical solutions of hereditary control problems via an approximation technique (with J. Burns, E. Cliff, and P. Thrift), LCDS Technical Report #75-6, October, 1975. Also appeared in *Proc. Intl. Symp. Simulation Software and Numerical Methods for Differential Equations*, March, 1977.
35. Hereditary control problems: numerical methods based on averaging approximations (with J. Burns), *SIAM J. Control & Opt.*, 16 (1978), 169-208.
36. Approximation methods for optimal control problems with delay-differential systems, *Seminares IRIA: Analyse et Controle de Systemes*, (1976), 5-19.
37. Delay systems in biological models: approximation techniques, *Nonlinear Systems and Applications* (V. Lakshmikantham, ed.), Academic Press (1977), 21-38.
38. Approximation of nonlinear functional differential equation control systems, *J. Opt. Theory Appl.*, 29 (1979), 383-408.

39. Approximation techniques for control systems with delays (with J. Burns), *Proc. Intl. Conf. on Math, Programming, Zakopane, Poland, September, 1977*.
40. Global asymptotic stability of certain models for protein synthesis and repression (with J. Mahaffy), *Quart. Applied Math.*, 36 (1978), 209-221.
41. Stability of cyclic gene models for systems involving repression (with J. Mahaffy), *J. Theoretical Biology*, 74 (1978), 323-334.
42. Optimal control of diffusion-reaction systems (with Duban and Kernevez), *Applied Nonlinear Analysis* (V. Lakshmikantham, Ed.), Academic Press (1979), 47-59.
43. Approximation of delay systems with applications to control and identification, *Proc. Intl. Conf. on FDE and Approximation of Fixed Points*, Springer-Verlag Lecture Notes in Math., No. 730 (1979), 65-76.
44. Spline Approximations for functional differential equations (with F. Kappel), *J. Differential Equations*, 34 (1979), 496-522.
45. Spline based approximation methods for control and identification of hereditary systems (with J. Burns and E. Cliff), *Int. Symp. on Systems Opt. and Analysis* (A. Bensoussan and J.L. Lions, Eds.), Lecture Notes in Control and Info. Sciences, 14 Springer, Heidelberg (1979), 314-320.
46. Mathematical models for protein synthesis (with J. Mahaffy), LCDS Technical Report #79-4, August, 1979.
47. A comparison of numerical methods for identification and optimization problems involving control systems with delays (with J. Burns and E. Cliff), LCDS Technical Report #79-7, November, 1979.
48. Parameter estimation and identification for systems with delays (with J. Burns and E. Cliff), *SIAM J. Control & Opt.*, 19 (1981), 791-828.
49. A comparison of mathematical models for a recycling cascade in glycogenolysis (with R.P. Miech and S.L. Olson), *J. Math. Modeling*, 1 (1980), 13-26.
50. Computational difficulties in the identification and optimization of control systems (T. Vincent, Ed.), Lecture Notes in Biomath, 40, Springer-Verlag (1981), 79-94.
51. Nonlinear differential equation models in enzyme regulated pathways, *Proc. Conf. on Math. Biol.* (T. Burton, Ed.), Pergamon Press, to appear.
52. Identification of nonlinear delay systems using spline methods, *Proc. Intl. Conf. on Nonlinear Phenomena in Math. Sciences* (V. Lakshmikantham, Ed.), Academic Press (1982), 47-55.

53. Parameter estimation techniques for nonlinear distributed parameter systems (with K. Kunisch), *Nonlinear Phenomena in Math, Sciences* (V. Lakshmikantham, Ed.), Academic Press (1982), 57-67.
54. Parameter identification techniques for physiological control systems, in *Lectures in Applied Math.*, 19, American Mathematical Society, Providence, RI (1981), 361-383.
55. Approximation techniques for parameter estimation in hereditary control systems (with I.G. Rosen), *Proc. IEEE - CDC*, (1980), 741-743.
56. An approximation theory for nonlinear partial differential equations with applications to identification and control (with K. Kunisch), LCDS Technical Report #81-7, April 1981; *SIAM J. Control & Opt.*, 20 (1982), 815-849.
57. A survey of some problems and recent results for parameter estimation and optimal control in delay and distributed parameter systems, LCDS Technical Report #81-19, July 1981; *Volterra and Functional Differential Equations*, (K. Hannsgen, et al., Eds.), Lecture Notes in Pure and Applied Mathematics, 81 Dekker (1982), 3-24.
58. Parameter estimation of nonlinear nonautonomous distributed systems (with P.L. Daniel), *Proc. 20th IEEE Conf. Dec. and Control*, San Diego, CA, December 1981, 228-232.
59. Spline approximations for linear nonautonomous delay systems (with I.G. Rosen), ICASE Rep. No. 81-33, NASA Langley Res. Center, Oct., 1981; *J. Math. Anal. Appl.*, 96 (1983), 226-268.
60. Parameter estimation for distributed systems arising in elasticity (with J.M. Crowley), LCDS Report 81-24, Nov. 1981. *Proc. Symposium on Engineering Sciences and Mechanics* (National Cheng Kung University), Tainan, Taiwan, December, 1981, 158-177.
61. Cubic spline approximation techniques for parameter estimation in distributed systems (with J.M. Crowley and K. Kunisch), LCDS Report #81-25, Nov. 1981; *IEEE Trans. Auto. Control*, AC-28 (1983), 773-786.
62. Estimation of delays with other parameters in nonlinear functional differential equations (with P.L. Daniel), LCDS Report #82-2, Dec. 1981; *SIAM J. Control & Opt.*, 21 (1983), 895-915.
63. Distributed system optimal control and parameter estimation: computational techniques using spline approximations, LCDS Report #82-6, Apr. 1982; in *Proc. 3rd IFAC Symposium on Control of Distributed Parameter Systems*, Toulouse, France, June 29-July 2, 1982.

64. Parameter estimation in Timoshenko beam models (with J.M. Crowley), LCDS Report #82-14, June 1982; *J. Astronautical Sciences*, 31 (1983), 381-397.
65. Parameter estimation techniques for transport equations with application to population dispersal and tissue bulk flow models (with P. Kareiva), LCDS Report #82-13, July 1982; *J. Math. Biol.*, 17 (1983), 253-273.
66. Algorithms for estimation in distributed models with applications to large space structures, *Proc. Workshop on Applications of Distributed System Theory to the Control of Large Space Structures*, JPL - California Institute of Technology, July, 1982, Pasadena, CA.
67. A spline based technique for computing Riccati operators and feedback controls in regulator problems for delay equations (with I.G. Rosen and K. Ito), ICASE Report #82-31, NASA Langley Research Center, 1982; *SIAM J. Scientific and Statistical Computing*, 5 (1984), 830-855.
68. Parameter estimation for static models of the Maypole Hoop/Column Antenna surface (with P.L. Daniel and E.S. Armstrong), *Proc. IEEE Intl. Large Scale Systems Symposium*, October, 1982, Virginia Beach, VA; ICASE Report #82-26.
69. Estimation of variable coefficients in parabolic distributed systems (with P.L. Daniel), LCDS Technical Report; #82-22, September 1982; *IEEE Trans. Auto. Control*, 30 (1985), 386-398.
70. Inverse problems for hyperbolic systems with unknown boundary conditions, (with K.A. Murphy), LCDS Technical Report #82-30, November 1982; *Proc. Conf. on Control Theory for Distributed Systems*; Springer Lecture Notes on Info. Sci., 54, (1983), 35-44.
71. Parameter identification in continuum models (with J.M. Crowley), LCDS Technical Report #83-1, March 1983; *J. Astronautical Sciences*, 33 (1985), 85-94.
72. Modeling of flexible surfaces: a preliminary study (with G. Majda), LCDS Technical Report #83-18, May 1983; *Int. J. Math. Modeling*, 5 (1984), 103-115.
73. The linear regulator problem for parabolic systems (with K. Kunisch), LCDS Technical Report #83-18, May 1983; *SIAM J. Control & Opt.*, 22 (1984), 684-698.
74. Computational methods for estimation of parameters in hyperbolic systems (with K. Ito and K.A. Murphy), *Proc. Conf. Inverse Scattering: Theory and Applications*, University of Tulsa, May, 1983, SIAM, Philadelphia, PA, 181-193.
75. Estimation of temporally and spatially varying coefficients in models for insect dispersal (with P.K. Daniel Lamm and P.M. Kareiva), LCDS Technical Report #83-14, June, 1983.

76. Spline-based estimation techniques for parameters in elliptic distributed systems (with P.L. Daniel and E.S. Armstrong), LCDS Technical Report #83-22, June, 1983. To appear, *Proc. for VPISU/AIAA Symposium on Dynamical Systems and Control of Large Structures*, Blacksburg, VA, June, 1983.
77. A spline-based parameter and state estimation technique for static models of elastic surfaces (with P.L. Daniel and E.S. Armstrong), ICASE Report #83-25, June, 1983; condensed version in *Proc. NASA/ACC Workshop on Identification and Control of Flexible Space Structures*, June, 1984, San Diego, CA, JPL, 3 (1985), 263-282.
78. Estimation techniques for transport equations (with P.L. Daniel and P.M. Kareiva), LCDS Technical Report #83-23, July, 1983; *Proc. Conf. on Mathematics in Biology and Medicine*, Lecture Notes in Biomathematics, Springer-Verlag (1985), 428-438.
79. Approximation of feedback controls for parabolic systems (with K. Kunisch), *Proc. 1983 Conf. on Dec. and Control*, December, 1983, San Antonio, TX, 247-251.
80. Estimation of coefficients and boundary parameters in hyperbolic systems (with K.A. Murphy), LCDS Technical Report #84-5, February 1984; *SIAM J. Control & Opt.*, 24 (1986), 926-950.
81. Fully discrete approximation methods for the estimation of parabolic systems and boundary parameters (with I.G. Rosen), LCDS Technical Report #84-19, May 1984; *Acta Applicandae Mathematicae*, 7 (1986), 1-34.
82. Approximation techniques for parameter estimation and feedback control for distributed models of large flexible structures (with I.G. Rosen), ICASE Report #84-26, June 1984; *Proc. NASA/ACC Workshop on Identification and Control of Flexible Space Structures*, June, 1984, San Diego, JPL, 2 (1985), 145-156.
83. Estimation of material parameters in elastic systems (with J.M. Crowley), LCDS Technical Report #84-20, June 1984.
84. A Galerkin method for the estimation of parameters in hybrid systems governing the vibration of flexible beams with tip bodies (with I.G. Rosen), CSDL Report R-1724, June 1984, Charles Stark Draper Laboratories, Cambridge, MA.
85. Estimation of parameters in nonlinear distributed systems (with K. Murphy), *Proc. 23rd IEEE Conf. on Dec. and Control*, December, 1984, Las Vegas, NV, 257-261.

86. Modeling insect dispersal and estimating parameters when mark-release techniques may cause initial disturbances (with P.M. Kareiva and P.K. Lamm), *J. Math. Biol.*, 22 (1985), 259-277.
87. On a variational approach to some parameter estimation problems, LCDS Technical Report #85-14, May 1985; in *Distributed Parameter Systems* (F. Kappel, et.al.) Springer Lecture Notes in Control and Info. Sci., 75 (1985), 1-23.
88. Numerical schemes for the estimation of functional parameters in distributed models for mixing mechanisms in lake and sea sediment cores (with I.G. Rosen), LCDS Technical Report #85-27, October, 1985; *J. Inverse Problems* 3 (1987), 1-23.
89. Approximation methods for the solution of inverse problems in lake and sea sediment core analysis (with I.G. Rosen), *Proc. 24th IEEE Conf. on Dec. and Control*, December, 1985, Ft. Lauderdale, FL.
90. Modeling Holocene changes of the location and abundance of Beech populations in eastern North America (with F. Dexter and T. Webb III), LCDS Technical Report #86-36, Brown University, Sept. 1986; *Review of Palaeobotany and Palynology* 50 (1987), 273-292.
91. Quantitative modeling of growth and dispersal in population models (with K.A. Murphy), LCDS Report #86-4, January 1986; *Proc. Intl. Symposium on Mathematical Biology*, November, 1985, Kyoto, Japan; Springer LN in Biomath 71 (1987), 98-109.
92. A comparison of stability and convergence properties of techniques for inverse problems (with D. Iles), LCDS Report #86-3, January 1986.
93. Estimation of stiffness and damping in cantilevered Euler-Bernoulli beams with tip bodies (with I.G. Rosen, and C. Wang), *Proc. IFAC Symposium on Control of D.P.S.*, Los Angeles (1986).
94. Methods for the identification of material parameters in distributed models for flexible structures (with J.M. Crowley and I.G. Rosen) ICASE Report #84-66, NASA Langley Res. Ctr., Hampton VA 1986; *Mat. Aplicada e Computational*, 5 (1986), 139-168.
95. Computational methods for the identification of spatially varying stiffness and damping in beams (with I.G. Rosen), LCDS Report. 86-39, Brown University, August, 1986; *Control: Theory and Advanced Technology*, 3(1987), 1-32.
96. On compactness of admissible parameter sets: convergence and stability in inverse problems for distributed parameter systems (with D.W. Iles), ICASE Report #86-38, NASA Langley Res. Ctr., Hampton VA 1986; *Proc. Conf. on Control Systems*

- Governed by PDE's*, February, 1986, Gainesville, FL, Springer Lecture Notes in Control & Inf. Science, 97 (1987), 130-142.
97. Parameter estimation techniques for interaction and redistribution models of species interactions: a predator-prey example, (with P.M. Kareiva and K.A. Murphy), LCDS Technical Report #86-29, May 1986; *Oecologia*, 74 (1987), 356-362.
  98. The identification of a distributed parameter model for a flexible structure, (with S. Gates, G. Rosen & Y. Wang), ICASE Report 86-71, NASA Langley Res. Center, Hampton, VA, Sept. 1986; *SIAM Journal on Control & Opt.*, 26 (1988), 743-762.
  99. Analyzing field studies of insect dispersal using two-dimensional transport equations, (with P. Kareiva & L. Zia), LCDS/CCS Rep. 86-48, Nov, 1986; *Environmental Entomology*, 17 (1988), 815-820.
  100. A numerical algorithm for optimal feedback gains in high dimensional LQR problems, (with K.Ito), ICASE Rep. 86-76, October, 1986; *SIAM Journal on Control & Opt.*, 29 (1991), 499-515.
  101. Spline-based distributed system identification with application to large space antennas, (with P.K. Lamm, & E.S. Armstrong), *Journal of Guidance, Control, and Dynamics*, 9 (1986), 304-311.
  102. Inverse problems in the modeling of vibrations of flexible beams (with R. Powers and I.G. Rosen), in *Distributed Parameter Systems* (F. Kappel, et.al.), Springer Lecture Notes in Control and Info. Science, 102 (1987), 1-22.
  103. A theoretical framework for convergence and continuous dependence of estimates in inverse problems for distributed parameter systems (with K. Ito), LCDS/CCS Rep. 87-20, March, 1987, Brown Univ.; *Applied Math. Lett.* Vol. 0, No. 1, June (1987), 31-35.
  104. Modeling and estimation in size structured population models (with L.W. Botsford, F. Kappel and C. Wang), LCDS/CCS Rep. 87-13, March, 1987, Brown Univ.; *Proc. 2nd Course on Math. Ecology* (Trieste, December, 1986), World Scientific Press, Singapore (1988), 521-541.
  105. Estimation of nonlinearities in parabolic models for growth, predation and dispersal of populations (with K.A. Murphy), LCDS/CCS Rep. 87-36, August, 1987, Brown Univ.; *J. Math. Anal. Appl.*, 141 (1989), 580-602.
  106. Computational techniques for inverse problems in size-structured stochastic population models, *Proc. IFIP Conf. on Optimal Control of Systems Governed by PDE* (Santiago de Compostela, July, 1987), Springer LN in Control and Info. Sciences, 114, 3-10.

107. Computational techniques for estimation and control of distributed parameter systems, *Proc. IMACS/IFAC Intl. Symp. on Modeling and Simulation of DPS*, (Y. Sunahara, et. al., eds.), Hiroshima, Japan, October, 1987, 19-22.
108. Filtering problems for the stochastic vibration of flexible beams with tip bodies (with F. Kojima), *Proc. IMACS/IFAC Intl. Symp. on Modeling and Simulation of DPS*, (Y. Sunahara, et. al., eds.), Hiroshima, Japan, October, 1987, 515-522.
109. Parameter identification techniques for the estimation of damping in flexible structure experiments (with Y. Wang, D.J. Inman and H. Cudney), *Proc. 26th IEEE Conf. on Dec. and Control*, December, 1987, Los Angeles, 1392-1395.
110. Approximation techniques for domain identification in two dimensional parabolic systems under boundary observations (with F. Kojima), *Proc. 26th IEEE Conf. on Dec. and Control*, December, 1987, Los Angeles, 1411-1416.
111. A unified framework for approximation and inverse problems for distributed parameter systems (with K. Ito), *Control-Theory and Adv. Tech.*, 4 (1988), 73-90.
112. Boundary shape identification problems in two dimensional domains related to thermal testing of materials (with F. Kojima), LCDS/CCS Rep. 88-6, April, 1988; *Quart. Applied Math.*, Vol. 47 (1989), 273-293.
113. An approximation theory for the identification of nonlinear distributed parameter systems (with S. Reich and I.G. Rosen), LCDS/CCS Rep. 88-8, April, 1988; *SIAM Journal on Control & Opt.*, 28 (1990), 552-569.
114. Estimation of Boltzmann damping coefficients in beam models (with R. Fabiano and Y. Wang), LCDS/CCS Rep. 88-13, July, 1988; *COMCON Conf. on Stabilization of Flexible Structures*, (Montpellier, December, 1987), Optimization Software, Inc., New York, 1988, 13-35.
115. Galerkin approximation for inverse problems for nonautonomous nonlinear distributed systems (with S. Reich and I.G. Rosen), LCDS/CCS Rep. 88-15, July, 1988; *Appl. Math. Opt.*, 24 (1991), 233-256.
116. Inverse problems for distributed systems: statistical tests and ANOVA (with B. Fitzpatrick), LCDS/CCS Rep. 88-16, July, 1988; *Proc. International Symposium on Math. Approaches to Envir. and Ecol. Problems*, Springer Lecture Note in Biomath., 81 (1989), 262-273.
117. Transformation semigroups and  $L^1$  approximation for size structured population models (with F. Kappel), LCDS/CCS Rep. 88-20, July, 1988; *Semigroup Forum* 38 (1989), 141-155.

118. Parameter estimation in nonlinear distributed systems - approximation theory and convergence results (with S. Reich and I.G. Rosen), *Applied Math. Letters* **1**, (1988), 211-216.
119. Boundary identification for 2-D parabolic systems arising in thermal testing materials (with F. Kojima), *Proc. 27th IEEE Conf. on Dec. and Control*, Austin, TX, December, 1988, 1678-1683.
120. Spatial versus time hysteresis in damping mechanisms (with R. Fabiano, Y. Wang, D. Inman and H. Cudney), *Proc. 27th IEEE Conf. on Dec. and Control*, Austin, TX, December, 1988, 1674-1677.
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356. Model fitting and prediction with HIV treatment interruption data (with B. M. Adams, M. Davidian, and E. S. Rosenberg) CRSC-TR05-40, October, 2005; *Bulletin of Math. Biology*, **69** (2007), 563–584.
357. Sensitivity to noise variance in a social network dynamics model (with A. F. Karr, H. K. Nguyen and J. R. Samuels, Jr.), CRSC-TR05-41, November, 2005; *Quarterly Applied Math*, **66** (2008), 233–247.

358. A dynamic model for induced reactivation of latent virus (with G.M. Kepler, H.K. Nguyen and J. Webster-Cyriaque), CRSC-TR05-44, December, 2005; *J. Theoretical Biology*, **244** (2007), 451–462.
359. Shrimp biomass and viral infection for production of biological countermeasures (with V. A. Bokil, S. Hu, F.C.T. Allnutt, R. Bullis, A. K. Dhar and C. L. Browdy), CRSC-TR05-45 December, 2005; *Math. Biosci. and Engr.*, **3** (2006), 635–660.
360. Void detection in foam with knit lines using THz pulse interrogation (with N.L. Gibson), CRSC-TR06-05 February, 2006; *Mathematical and Computer Modeling*, **44** (2006), pp. 807–815.
361. Modeling of viscoelastic shear: A nonlinear stick-slip formulation (with N.G Medhin and G.A. Pinter), CRSC-TR06-07, February, 2006; *Dynamic Systems and Applications*, to appear.
362. Monotone approximation for a nonlinear size and class age structured epidemic model (with V. A. Bokil and Shuhua Hu), CRSC-TR06-09, February, 2006; *Non-linear Analysis: Real World Applications*, **8** (2007), 834–852.
363. Standard errors and confidence intervals in inverse problems: Sensitivity and associated pitfalls (with Stacey L. Ernstberger and Sarah L. Grove), CRSC-TR06-10, March, 2006; *J. Inverse and Ill-posed Problems*, **15** (2007), 1–18.
364. Development of structured treatment interruption strategies for HIV infection (with E. S. Rosenberg and M. Davidian), CRSC-TR06-12, April, 2006; *Drug and Alcohol Dependence*, **88S** (2007), S41–S51.
365. Time delay systems with distribution dependent dynamics (with S. Dediú and H.K. Nguyen), CRSC-TR06-15, May, 2006; *IFAC Annual Reviews in Control*, **31** (2007), 17–26.
366. Static two-player evasion-interrogation games with uncertainty (with S.L. Grove, K. Ito and J.A. Toivanen), CRSC-TR06-16, June, 2006; *Comp. and Applied Math*, **25** (2006), 289–306.
367. Inverse problems and model validation: An example from latent virus reactivation (with G.M. Kepler, H.K. Nguyen and J. Webster-Cyriaque), CRSC-TR06-18, August, 2006; *J. Inverse and Ill-posed Problems*, **15** (2007), 19–35.
368. Parameter estimation versus homogenization techniques in time-domain characterization of composite dielectrics (with V.A. Bokil and N.L. Gibson), CRSC-TR06-20, August, 2006; *J. Inverse and Ill-posed Problems*, **15** (2007), 117–135.
369. Analysis of stability and dispersion in a finite element method for Debye and Lorentz dispersive media (with V.A. Bokil and N. L. Gibson), CRSC-TR06-21, August, 2006; *Numerical Methods for Partial Differential Equations*, to appear.

370. Pulsed THz interrogation of SOFI with knit lines in 2D (with N.L. Gibson and W.P. Winfree), CRSC-TR06-22, September, 2006; *Proc. QNDE*, to appear.
371. Sensitivity of dynamical systems to parameters in a convex subset of a topological vector space (with S. Dediu and H.K. Nguyen), CRSC-TR06-25, September, 2006; *Math. Biosci. and Engr.*, **4** (2007), 403–430.
372. A stick-slip/Rouse hybrid model for viscoelasticity in polymers (with J. B. Hood, N. G. Medhin, and J. R. Samuels, Jr.), CRSC-TR06-26, November, 2006; *Nonlinear Analysis: Real World Applications*, to appear (doi:10.1016/j.nonrwa.2007.06.015).
373. Simulations of propagating shear waves in biotissue employing an internal variable approach to dissipation (with N. S. Luke), CRSC-TR06-28, December, 2006; *Communications in Computational Physics*, **3** (2008), 603–640.
374. Viscoelasticity in polymers: Phenomenological to molecular mathematical modelling (with N. S. Luke, and J. R. Samuels, Jr.), CRSC-TR06-29, December, 2006; *Numerical Methods for Partial Differential Equations*, **23** (2007), 817–831.
375. Stochastic and deterministic models for agricultural production networks, (with P. Bai, S. Dediu, A. Y. Govan, M. Last, A. Loyd, H. K. Nguyen, M. S. Olufsen, G. Rempala, and B. D. Slenning), CRSC-TR07-06, February, 2007; *Math. Biosci. and Engr.*, **4** (2007), 373–402.
376. Analysis of viscoelastic wall properties in Ovine arteries, (with D. Valdez-Jasso, M.A. Haider, D.Bia Santana, Y. Zocalo German, R. Armentano, and M.S. Olufsen), CRSC-TR07-08, March, 2007; *IEEE Transactions on Biomedical Engineering*, **56**, (2009), 210–219.
377. Modeling HIV immune response and validation with clinical data, (with Marie Davidian, Shuhua Hu, Grace M Kepler, E. S. Rosenberg), CRSC-TR07-09, March, 2007; *J. Biological Dynamics*, **2** (2008), 357–385.
378. Time-varying vital rates in ecotoxicology: selective pesticides and aphid population dynamics, (with J.E. Banks, L.K. Dick and J.D. Stark), *Ecological Modelling*, **210** (2008), 155–160.
379. Sensitivity functions and their uses in inverse problems (with S. Dediu and S.E. Ernstberger), CRSC-TR07-12, July, 2007; *J. Inverse and Ill-posed Problems*, **15** (2007), 683–708.
380. An inverse problem statistical methodology summary (with M Davidian and J.R. Samuels, Jr.), CRSC-TR07-14, August, 2007;
381. Estimation of invasive pneumococcal disease dynamics parameters and the impact of conjugate vaccination in Australia (with K. L. Sutton and C. Castillo-Chavez), CRSC-TR07-15, August, 2007; *Math. Biosci. and Engr.*, **5** (2008), 175–204.

382. Dynamic models for insect mortality due to exposure to insecticides (with J.E. Banks, S. L. Joyner and J.D. Stark), CRSC-TR07-17, September, 2007; *Mathematical and Computer Modelling*, **48** (2008), 316–332.
383. Sensitivity equations for a size-structured population model (with S.L. Ernstberger and Shuhua Hu), CRSC-TR07-18, September, 2007; *Quarterly of Applied Mathematics*, to appear.
384. Quantifying uncertainty in the estimation of probability distributions (with J.L. Davis), CRSC-TR07-21, December, 2007; *Math. Biosci. Engr.*, **5** (2008), 647–667.
385. An Inverse Problem Statistical Methodology Summary, (with M. Davidian, J.R. Samuels, Jr. and Karyn L.Sutton), CRSC-TR08-01, January, 2008; Chapter 11 in *Statistical Estimation Approaches in Epidemiology*, (edited by Gerardo Chowell, Mac Hyman, Nick Hengartner, Luis M.A Bettencourt and Carlos Castillo-Chavez), Springer, Berlin Heidelberg New York, 2009, pp. 249–302.
386. A brief review of some approaches to hysteresis in viscoelastic polymers, CRSC-TR08-02, January, 2008; *Nonlinear Analysis: Theory, Methods and Applications*, **69** (2008), 807–815.
387. Comparison of probabilistic and stochastic formulations in modeling growth uncertainty and variability, (with J.L. Davis, S.L. Ernstberger, Shuhua Hu, E. Artimovich, A.K. Dhar and C.L. Browdy), CRSC-TR08-03, February, 2008; *J. Biological Dynamics*, **3** (2009), 130–148.
388. A model for HCMV infection in immunosuppressed patients, (with G.L. Kepler, M. Davidian and E. S. Rosenberg), CRSC-TR08-06, April, 2008; *Mathematical and Computer Modelling*, **49** (2009), 1653–1663.
389. HIV model analysis under optimal control based treatment strategies, (with J. David and H.T. Tran), CRSC-TR08-07, April, 2008; *Bulletin of Math. Biology*, submitted.
390. The estimation of the effective reproductive number from disease outbreak data, (with A. Cintron-Arias, C. Castillo-Chavez, L.M.A. Bettencourt and A.L. Lloyd), CRSC-TR08-08, April, 2008; *Math. Biosci. Engr.*, **6** (2009), 261–283.
391. Void detection in complex geometries, (with N.L. Gibson and W.P. Winfree), CRSC-TR08-09, May, 2008.
392. *Mathematical and Experimental Modeling of Physical and Biological Processes*, (with H.T. Tran), CRC Press, Boca Raton, FL, July, 2008, 308pp. published, January 2, 2009.

393. Well-posedness of inverse problems for systems with time dependent parameters, (with M. Pedersen), CRSC-TR08-10, August, 2008; *Arabian Journal of Science and Engineering: Mathematics*, **1** (2009), 39–58.
394. Thermal interrogation of porous materials, (with B. Boudreaux, K. Foster, C. Uttal, T. Vogel, A.K. Criner, and W.P. Winfree), CRSC-TR08-11, September, 2008; short version: Thermal Based Damage Detection in Porous Materials, *Inverse Problems in Science and Engr.*, submitted.
395. A new approach to optimal design problems, (with Sava Dediu, Stacey L. Ernstberger and Franz Kappel), CRSC-TR08-12, September, 2008; *Inverse Problems*, submitted.
396. Public vaccination policy using an age-structured model of pneumococcal infection dynamics, (with Karyn L. Sutton and Carlos Castillo-Chávez), CRSC-TR08-13, September, 2008; *J. Biol. Dynamics*, submitted.
397. Estimation in time-delay modeling of insecticide-induced mortality, (with J.E. Banks and S. L. Joyner), CRSC-TR08-15, October, 2008; *J. Inverse and Ill-posed Problems*, to appear.
398. Inverse problem methods as a public health tool in Pneumococcal vaccination, (with K.L. Sutton and C. Castillo-Chavez), CRSC-TR08-19, November, 2008; *J. Math. Biology*, submitted.
399. Experimental design and estimation of growth rate distributions in size-structured shrimp populations, (with J.L. Davis, S.L. Ernstberger, S. Hu, E. Artimovich, and A.K. Dhar), CRSC-TR08-20, November, 2008; *Inverse Problems*, submitted.
400. Detection of cardiac occlusions using viscoelastic wave propagation, (with J.R. Samuels, Jr.), CRSC-TR08-23, December, 2008; *Advances in Applied Mathematics and Mechanics*, **1** (2009), 1–28.
401. Viscoelastic models for passive arterial wall dynamics, (with D. Valdez-Jasso, M.A. Haider, D. Bia, Y. Zocalo, R.L. Armentano, and M.S. Olufsen), CRSC-TR08-24, December, 2008; *Advances in Applied Mathematics and Mechanics*, **1** (2009), 151–165.
402. A mathematical model for the first-pass dynamics of antibiotics acting on the cardiovascular system, (with Kathleen Holm, Nathan C. Wanner, Ariel Cintrón-Arias, Grace M. Kepler, Jeffrey D. Wetherington), CRSC-TR08-25, December, 2008; *Mathematical and Computer Modeling*, to appear.
403. A sensitivity matrix based methodology for inverse problem formulation, (with A. Cintron-Arias, A. Capaldi and A. L. Lloyd), CRSC-TR09-09, April, 2009; *J. Inverse and Ill-posed Problems*, submitted.

404. Conversion of dynamic social network stochastic differential equation model to Fokker-Planck model, (with K.L. Rehm and K.L. Sutton), CRSC-TR09-10, April, 2009;
405. Dynamic social network models incorporating stochasticity and delays, (with K.L. Rehm and K.L. Sutton), CRSC-TR09-11, May, 2009;

## Invited Lectures

Lectures at numerous universities in the U.S. and Europe plus:

1. Conference on Calculus of Variations and Control Theory, University of Michigan, November 30, 1969.
2. SIAM 1971 National Meeting, Seattle, Washington, June 1971.
3. Symposium on Ordinary Differential Equations, University of Utah, Salt Lake City, Utah, March 7-11, 1972.
4. Institut de Recherche d'Informatique et d'Automatique, Rocquencourt, France, May and June 1972.
5. Symposium on Mathematical Biology, University of Missouri, Columbia, Missouri, April 5-6, 1973.
6. 1973 Joint Automatic control Conference (JACC), Columbus, Ohio, June 1973.
7. Canadian Math. Congress, 14th Biennial Seminar, London, Ontario, August 12-24, 1973.
8. 1973 IEEE-SMC International Conference on Cybernetics and Society, Boston, Massachusetts, November 5-7, 1973.
9. International Conference on Optimal Control Theory, Stefan Banach International Mathematics Center, Institute of Mathematics, Polish National Academy of Sciences, Warsaw, Poland, January 1974.
10. Italy-U.S. Seminar on Variable Structure Systems with Emphasis on Biology and Economics, Portland, Oregon, May 26-31, 1974.
11. International Conference on Differential Equations, University of Southern California, Los Angeles, September 3-7, 1974.
12. NSF-AAAS Chautauqua Lectures: Mathematical Modeling in the Life Sciences; Western Circuit (Harvey Mudd, U. Texas, Oregon Graduate Center, Stanford); November 1975 and March 1976; Central Circuit (U. Wisconsin, U. Missouri, Kansas City, Miami U., L.S.U.) October 1976 and March 1977; Eastern Circuit (U. Hartford, U. Georgia), November 1977 and March 1978.
13. 1976 John W. Hurst Invited Lectures in Analysis, Montana State University, May 5-6, 1976.
14. IRIA and Universite de Technologie de Compiegne, France, May 12-29, 1976.

15. International Conference on Nonlinear Systems and Applications, University of Texas - Arlington, July 19-23, 1976.
16. American Mathematical Society Meeting, New York, April 14-15, 1977.
17. International Conference on Methods of Mathematical Programming, Zakopane, Poland, September, 1977.
18. International Conference on Nonlinear Methods, Arlington, Texas, April 1978.
19. SIAM Southeastern Regional Meeting, Columbia, S.C., April 7-8, 1978.
20. Principal Lecturer (10 lectures) NSF-CBMS Regional Conference, "Modeling and Differential Equations in Biology", Southern Illinois University, Carbondale, June 5-9, 1978.
21. International Conference on Functional Differential Equations and Approximation of Fixed Points, Universitat Bonn, July 17-22, 1978.
22. American Math. Society short course "Introduction to Systems and Control Theory", Providence, RI, August 6-7, 1978.
23. International Symposium on Systems Optimization and Analysis, IRIA, Rocquencourt, France, December 11-13, 1978.
24. Optimization Days 1979, McGill University, Montreal, May 23-25, 1979.
25. Canadian Math. Society Summer Seminar (5 lectures), University of Toronto, July 30-August 3, 1979.
26. Workshop on Applied Control Theory to Renewable Resource Management and Ecology, University of Canterbury, Christchurch, New Zealand, January 7-11, 1980.
27. Symposium on Biomathematics, Pisa, Italy, April 1-2, 1980.
28. Conference on Math. Biology, Southern Illinois University, Carbondale, IL, May 27-28, 1980.
29. International Conference on Nonlinear Phenomena in the Math. Sciences, University of Texas - Arlington, June 16-20, 1980.
30. A.M.S. Summer Seminar on Math. Aspects of Physiology, University of Utah, June 15-27, 1980.
31. AAAS-NSF Chautaugua Short Courses for Faculty; University of Texas - Austin; New York Polytechnic - Westchester; November 1980 and March 1981.

32. International Congress on Applied Systems Research and Cybernetics, Acapulco, Mexico, December 12-16, 1980.
33. SIAM Regional (Oklahoma-Texas) Meeting, Austin, Texas, March 13-14, 1981.
34. Conference on Volterra and Functional Differential Equations, VPI & SU, Blacksburg, Virginia, June 10-13, 1981.
35. Math. Assoc. of America (Ohio Section), Lorain, Ohio, October 23-24, 1981.
36. IEEE Conference on Decision and Control, San Diego, December 16-18, 1981.
37. Symposium on Engineering Sciences and Mechanics, National Cheng Kung University, Tainan, Taiwan, December 28-31, 1981.
38. IFAC Symposium on Control of Distributed Systems, Toulouse, France, June 29 - July 2, 1982 (invited lecture and served as Vice president of Congress).
39. Workshop on Control of Distributed Parameter Systems, Voral, Austria, July 12-14, 1982.
40. Workshop on Distributed Systems in Large Space Structures, Jet Propulsion Laboratory, Pasadena, California, July 14-16, 1982.
41. International Large Scale Systems Symposium, Virginia Beach, Virginia, October 11-13, 1982.
42. Conference on Inverse Scattering, University of Tulsa, Tulsa, Oklahoma, May 16-18, 1983.
43. SIAM National Meeting, Denver, Colorado, June 6-8, 1983.
44. American Control Conference, San Francisco, California, June 22-24, 1983.
45. Intl. Conf. on Mathematics in Biology and Medicine, Bari, Italy, July 18-22, 1983.
46. Conf. on Decision and Control, San Antonio, Texas, December 14-16, 1983.
47. 8th Annual Lecture Series in Math. Sciences (Principal Lecturer), Estimation and Control of Distributed Systems, University of Arkansas, Fayetteville, Arkansas, April 12-14, 1984.
48. Brazil, April and May, 1984 (Lecture tour including Regional Meeting, Sociedade Brasileira de Matematica Aplicada e Computacional; Rio Grande do Sul Fed. Univ., Porto Alegre; Lab. de Computacao Cientifica, Rio de Janeiro).

49. NASA/ACC Workshop on Identification and Control of Flexible Space Structures, San Diego, California, June 4-6, 1984.
50. Conference on Optimal Control in Distributed Systems with Applications, Vorau, Austria, July 9-13, 1984.
51. Conference on Decision and Control, Las Vegas, California, December 12-14, 1984.
52. SEG/SIAM/SPE Conference on Mathematical and Computational Methods in Seismic Exploration and Reservoir Modeling, Houston, Texas, January 21-24, 1985.
53. Workshop on Flexible Structures and Distributed Parameter Systems, Tampa, Florida, March 4-8, 1985.
54. SIAM Minisymposium on Gradient and Finite Element Techniques in Optimal Control, Pittsburgh, June 4-8, 1985.
55. International Symposium on Variational Methods in Geosciences, Norman, Oklahoma, October 15-17, 1985.
56. Japan, November 7-21, 1985: Lectures at International Symposium on Math. Biology, Kyoto; Kyoto Institute of Technology; Osaka University.
57. Conference on Decision and Control, Fl. Lauderdale, Florida, December 11-13, 1985.
58. IFIP-TC7 Conference on Control Problems for Systems Described by Partial Differential Equations, University of Florida, Gainesville, Florida, February 3-6, 1986.
59. Principal Lecturer (short course), Workshop on Mathematical Models in Biology and Medicine, Inst. Numerical Analysis of the C.N.R., Pavia, Italy, June 23-27, 1986.
60. International Conference on Control and Identification of Distributed Systems, Vorau, Austria, July 6-12, 1986.
61. 2nd Workshop on Control of Systems Governed by Partial Differential Equations, Val David, Quebec, October 5-9, 1986.
62. 2nd Autumn Course on Mathematical Ecology, Trieste, Italy, December 8-12, 1986.
63. Eli Lilly Applied Mathematics Lectures, Rose Hulman Institute of Technology, Terre Haute, Sept. 5,6; Nov. 21, 22, 1986; April 3, 4, 1987.

64. Balomenos Lectures in Applied Mathematics, Un. New Hampshire, Durham, April 10, 1987.
65. Workshop on Applications and Algorithms for Optimal Control and Parameter Identification, Universitat Trier, West Germany, June 24-27, 1987.
66. IFIP Conference on Optimal Control of Systems Governed by Partial Differential Equations, Univ. Santiago, Santiago de Compostela, Spain, July 6-9, 1987.
67. Sixth Intl. Conference on Math. Modeling, St. Louis, Mo., August 4-7, 1987.
68. Japan: Sept. 23 - Oct. 10, 1987: Lectures at Institute of Biophysics, Kyoto University; Kyoto Institute of Technology; Osaka University and Principal Lecturer at Intl. Symp. on Modeling and Simulation of Distributed Parameter Systems, Hiroshima Inst. Tech., Hiroshima, Oct. 6-9, 1987.
69. Intl. Symp. on Math. Approaches to Environmental and Ecological Problems, Cornell University, Oct. 28-30, 1987.
70. Conference on Decision and Control, Los Angeles, Dec. 9-11, 1987.
71. COMCON Conf. on Stabilization of Flexible Structures, Montpellier, France, Dec. 11-15, 1987.
72. Workshop on Experiments and Computation in Structures, University of Wisconsin, Madison, May 15-28, 1988.
73. IFIP Conf. on Shape Optimization and Stabilization, Clermont-Ferrand, France, June 20-22, 1988.
74. INRIA, Rocquencourt, France, June 23, 28, 1988.
75. 4th Intl. Conf. on Control of Distributed Parameter Systems, Voral, Austria, July 11-15, 1988.
76. Intl. Symposium on Numerical Solutions of PDE, VPISU, Blacksburg, VA, September 24-27, 1988.
77. Midwestern Conference on Differential Equations, Iowa State University, Ames, IA, October 28-29, 1988.
78. IEEE Conf. on Decision and Control, Austin, TX, December 7-9, 1988.
79. AMS/MAA Joint Math Meetings, Phoenix, January 9-14, 1989.
80. Distinguished Lecturer Series in Applied Mathematics, Emory University, March 20-23, 1989.

81. SIAM Conf. on Control in the 90's, San Francisco, May 17-19, 1989.
82. Intl. Conf. on Differential Equations and Applications, Retzhof, Austria, June 19-23, 1989.
83. Plenary Lecture, 5th IFAC Symp. on Control of DPS, Perpignan, France, June 26-29, 1989.
84. AMS/SIAM Summer Conf. on Inverse Problems for PDE, Arcata, CA, July 30-Aug. 4, 1989.
85. Intl. Conf. on Population Structure, University of California - Davis, September 20-22, 1989.
86. Workshop on Computational Techniques in ID and Control of Flexible Flight Structures, Lake Arrowhead, CA, November 2-4, 1989.
87. Ninth S.W. Symposium on Systems Theory, Texas Tech. University, December 9-12, 1989.
88. 28th IEEE Conf. on Decision and Control, Tampa, December 13-15, 1989.
89. Amer. Math. Society, Session on Control and Differential Equations, Louisville, KY, January 17-20, 1990.
90. Intl. Conf. on Optimization and Nonlinear Analysis, Haifa, Israel, March 21-27, 1990.
91. Distinguished Lecturer Series, Clemson University, April 2-6, 1990.
92. Los Alamos - UNM Distinguished Lecture Series, Albuquerque, NM, April 23-27, 1990.
93. Plenary Lecture, IFIP Intl. Conf. on Control of DPS, Fudan University, Shanghai, China, May 6-10, 1990.
94. Intl. Conf. on DPS Control and Applications, Voral, Austria, July 9-13, 1990.
95. Plenary Lecture, 2nd Conf. on Computation and Control, Bozeman, MT, August 1-7, 1990.
96. Plenary Lecture, Intl. Symp. on Inverse Problems in Engineering and Science, Osaka Institute of Technology, Osaka, Japan, August 18-21, 1990.
97. Invited Lecture Series - Japan, (Kobe University, Tokyo University, National Aerospace Laboratories), August 23-29, 1990.

98. Invited Lecture - USSR Academy of Sciences; Steklov Institute, Moscow; Georgian Academy of Science, Tbilisi; September 3-8, 1990.
99. Plenary Lecture, Intl. Symp. on ID in Dynamical Systems and Inverse Problems, Suzdal, USSR, September 10-14, 1990.
100. 28th IEEE Conference on Decision and Control, Honolulu, December 5-7, 1990.
101. Distinguished Lecture Series, Center for Engineering Mathematics, University of Texas - Dallas, March 7-8, 1991.
102. International Conference on Inverse Problems: Computational Algorithms, Texas A&M University, College Station, March 10-14, 1991.
103. 11th Annual CNLS Conference: Computational Issues in Nonlinear Sciences, Center for Nonlinear Sciences, Los Alamos National Laboratories, Los Alamos, May 20-24, 1991.
104. Conference on Optimization, North Carolina State University, Raleigh, July 15-17, 1991.
105. IMACS World Congress on Applied Math and Computation, Trinity College, Dublin, Ireland, July 21-26, 1991.
106. Principal Lecturer, Workshop on Modern Computational Methods in Industrial Mathematics, Harvey Mudd College, Claremont, CA, August 15-16, 1991.
107. Tutorial Short Course, Intl. Symp. on Active Materials and Smart Structures, Alexandria, VA, November 4-7, 1991.
108. 29th IEEE Conference on Decision and Control, Brighton, England, December 11-13, 1991.
109. Fields Institute Conference on Control and Identification (June, 1992), Univ. of Waterloo.
110. AMS/SIAM Conference on Control of PDE (July, 1992), Mt. Holyoke College.
111. International Conference on Computation and Control (August, 1992), Montana State Univ.
112. International Conference on Nonlinear Analysis (August, 1992), Tampa.
113. Workshop on Flow Control, Institute of Mathematical Analysis, U. Minnesota, Nov. 16-20, 1992, Minneapolis.
114. 30th IEEE Conference on Decision and Control, Tucson, Az., Dec. 16-18, 1992.

115. SPIE Conference on Smart Materials and Structures, Albuquerque, NM, Feb. 1-4, 1993.
116. Ecole Polytechnic de Lyon, Lyon, France, March, 1993.
117. AMS Regional Meeting, Knoxville, TN, March 26-27, 1993.
118. IEEE Symp. on New Directions in Control, Chania, Crete, June 21-23, 1993.
119. Conf. on Control and Estimation of Distributed Parameter Systems: Nonlinear Phenomena, Vorau, Austria, July 18-24, 1993.
120. Intl. Symp. on Math. Theory of Networks and Systems, Regensburg, Germany, August 2-6, 1993.
121. 14th ASME Vibration and Noise Conference, Albuquerque, September 20-22, 1993.
122. Plenary Lecture, SE Atlantic Regional Conference on Diff. Eqns., UNC-W, October 15-16, 1993.
123. Ex-Students Assoc. Distinguished Scholar Lecturer, Texas Tech Univ., Lubbock, March 3-4, 1994.
124. Invited Lecture Series: Universite de Paris VI; Universite Joseph Fourier, Grenoble; Universite Versailles; March 19-31, 1994.
125. Zaborszky Distinguished Lecture Series, Washington Univ., St. Louis, April 25-27, 1994.
126. College de France and Universite de Pierre et Marie Curie, Paris VI, May 1-13, 1994; Universite de Besancon, May 6, 1994.
127. University of Manchester, England, May 9, 1994.
128. Technische Universitat Berlin, May 13-15, 1994.
129. Universitat Graz, Austria, May 15-26, 1994.
130. International Conf. on Differential Equations with Applications, Harvey Mudd College, Claremont, CA, June 1-4, 1994.
131. Japan-Russia Conference on Inverse Problems in Elasticity, Kyoto University, July 20-22, 1994.
132. Intl. Conf. on Inverse Problems in Engineering Science -94, Osaka, July 27-29, 1994.

133. Japan: Kobe University, July 25-26; Osaka Inst. Tech., July 30; Tokyo University, July 31, 1994.
134. Conf. on Computation and Control IV, Bozeman, MT, August 2-9, 1994.
135. U.S. Universities: Fall 1994; Texas Tech, Texas A&M, Drake U., Iowa State, U. Minn-Duluth, U. Washington of Seattle, HMC/Pomona/CGS, U. So. Calif.
136. IEEE Conf. on Decision and Control, Orlando, FL, Dec 13-17, 1994.
137. Spain: March 11-20, 1995; Universidad de Cantabria, March 13-14; Universidad de Oviedo (as Scientific Consultant, Program in Applied Math and Sci. Computation), March 14-18, 1995.
138. SIAM Conf. on Control and its Applications, St. Louis, April 27-29, 1995.
139. Plenary Lecturer, IEEE Mediteranean Symposium on New Directions in Control and Automation, Limassol, Cyprus, July 10-14, 1995.
140. Euromech 341 - Smart Materials and Structures, Giens, France, Sept 26-29, 1995.
141. SIAM National Meeting, Charlotte, NC, Oct 23-26, 1995.
142. ASM/TMS Materials Week '95, Cleveland, OH, Oct 31-Nov 2, 1995.
143. Institut fur Matematik, Universitat Graz, Graz, Austria, Nov 6-10, 1995.
144. Plenary Lecturer, Amer. Math Society Southeast Regional, Greensboro, NC, Nov 17-18, 1995.
145. Intl. Conf on Elasticity, Viscoelasticity and Optimal Control, Lyon, France, Dec 6-8, 1995.
146. NSF/ARPA Workshop on Thin Films, IMA, Univ. Minnesota, Feb. 1-3, 1996.
147. National Academy Sciences AFOSR Review, Washington, DC, Feb 13-14, 1996.
148. Conf. on Modeling and Computation for Applications in Science and Engineering, Northwestern University, May 3-4, 1996.
149. Université de Franche-Comte, Besancon, France, May 17-24, 1996.
150. Intl. Symp. Math Theory of Network and Systems -MTNS96 - St. Louis, MO, June 24-27, 1996.
151. 2nd World Congress on Nonlinear Analysis, Athens, Greece, July 10-14, 1996.
152. Conf. on Control of Distributed Parameter Systems, Vora, Austria, July 15-19, 1996.

153. SIAM National Meeting, Kansas City, July 22-26, 1996.
154. Conference on Computation and Control V, Montana State University, Bozeman, July 20-August 2, 1996.
155. National Research Council Chairman's Conference, Washington DC, Oct. 11-13, 1996.
156. Intl. Seminar on Parameter Estimation and Optimal Design, Osaka Inst. Tech., Osaka, Japan, Dec. 9-10, 1996.
157. IEEE Conference on Decision and Control, Kobe, Japan, Dec. 11-13, 1996.
158. ME/AE Distinguished Lecture Series, U. Maryland, Feb. 20, 1997.
159. IFIP Conf. on Optimal Control, U. Florida, Feb. 27-Mar. 1, 1997.
160. SPIE Conf. on Smart Structures and Materials, San Diego, Mar. 2-6, 1997.
161. Rencontres Mathematiques de Rouen: Homogeneisation, Solutions Renormalisees et Solutions de Viscosite, Rouen, France, April 22-23, 1997.
162. Ecole Polytechnic, Palaiseau, France, April 30, 1997.
163. Intl. Conference on PDE and Control, CIRM, Marseille-Luminy, France, June 16-20, 1997.
164. SIAM National Meeting, Palo Alto, CA, July 14-18, 1997.
165. Plenary Lecture, 8th International Congress on Biomathematics, Panama City, Panama, August 25-29, 1997.
166. 3rd ARO Workshop on Smart Structures, VPISU, Blacksburg, August 28-30, 1997.
167. Plenary Lecture, XX Brazilian National Congress, Gramado, Brazil, September 8-12, 1997.
168. Symp. on Vibrations, Controls and Signals, II Panamerican Workshop on Applied and Computational Mathematics, Gramado, Brazil, September 10-12, 1997.
169. Workshop on Optimal Design and Control, Crystal City, VA, Sept. 1-3, 1997.
170. 1997 UNH Tech Lecture Series, U. New Hampshire, Oct. 13-15, 1997.
171. C.G. Johnson Colloquium Series, Worcester Polytech, Oct. 16, 1997.
172. IEEE Conf. on Decision and Control, San Diego, Dec. 10-13, 1997.

173. AMS/MAA Annual Meeting, Baltimore, MD, Jan. 7-10, 1998.
174. Plenary Lecture, Intl. Conf. on Inverse Problems, U. Phillipines, Manila, Feb. 23-27, 1998.
175. Intl. Workshop on Control Fluids and Structures, Paris, March 9-13, 1998.
176. Invited Lecture Series, Control Theory and Applications, Centre Henri Poincaré, Paris, March 16 - April 3, 1998.
177. College de France Colloquium, April 3, 1998.
178. 1998 School of Science Distinguished Alumnus Colloquium, Purdue University, West Lafayette, IN, April 23, 1998.
179. Plenary Lecture, 4<sup>th</sup> SIAM Conference on Control and Its Applications, Jacksonville, FL, May 7-9, 1998.
180. Tutorial Workshop and Keynote Lecture, International Conference on Optimization Techniques and Applications, Perth, Australia, June 29-July 3, 1998.
181. Conference on Computation and Control VI, Montana State University, Bozeman, MT, August 4-7, 1998.
182. ARO Damping Workshop, VPISU, Blacksburg, VA, October 19-22, 1998.
183. Intl. Conf. on Semigroups of Operators: Theory and Applications, Newport Beach, CA, December 14-18, 1998.
184. Institut for Mathematical Systems, Universitat Groningen, The Netherlands, January 6-9, 1999.
185. SPIE Symposium on Smart Structures and Materials, Newport Beach, CA, March 1-4, 1999.
186. AMS Western Regional Conference, Las Vegas, NV, May 9-11, 1999.
187. AIAA/CEAS Aeroacoustics Conference, Bellvue, WA, May 10-12, 1999.
188. NSF Workshop on Active Flow Control, University of California, San Diego, May 31-June 1, 1999.
189. SIAM Math-In-Industry Workshop, Harvey Mudd College, Claremont, CA, June 16-19, 1999.
190. Workshop on Control, System Theory and Mathematical Modeling, Gadjah Mada University, Yogyakarta, Indonesia, July 19-23, 1999.

191. International Conference on Math and Its Application, SE Asian Math Society, Gadjadara University, Yogyakarta, Indonesia, July 26-29, 1999.
192. Intl. Workshop on Systems with Hysteresis, Weierstrass Institute for Applied Analysis and Stochastics, Berlin, September 20-24, 1999.
193. SIAM Conf. in Industrial Applied Mathematics, Raleigh, NC, Oct. 10-12, 1999.
194. Conf. on Advances in Control of Nonlinear Distributed Parameter Systems, Texas A&M University, College Station, TX, Oct. 22-23, 1999.
195. Invited Survey Lecture, SPIE Symposium on Smart Materials and Structures, Newport Beach, CA, March 5-9, 2000.
196. Trends in Dynamical Systems, Institute of Mathematics, Universität Graz, Graz, Austria, March 16-18, 2000.
197. Plenary Lecture, SIAM-SEAS Annual Conference, Univ.-Georgia, Athens, GA, March 24-25, 2000.
198. AMS Symposium on Mathematical Models in the Biological and Physical Sciences, Univ. Louisiana-Lafayette, April 14-16, 2000.
199. Workshop on Principal Orthogonal Decomposition and its Applications, Graz, Austria, May 25-27, 2000.
200. Conference on Optimal Control of Complex Dynamical Structure, Mathematisches Forschungsinstitut Oberwolfach, Germany, June 4-10, 2000.
201. Plenary Lecture, 2nd European Conference on Structural Control, Ecole Nationale des Ponts et Chaussées, Champs-sur-Marne, France, July 3-6, 2000.
202. Conference on Computation and Control VII, Bozeman, MT, August 1-4, 2000.
203. International Workshop on Hysteresis, Univ. Ill.-Chicago, August 28-30, 2000.
204. SIAM Conf. on Computational Science and Engineering, Washington, DC, Sept. 21-24, 2000.
205. SIAM NW Regional Mathematics in Industry Workshop, Univ.-Washington, Seattle, WA, Oct. 12-14, 2000.
206. Hong Kong University of Science and Technology, Hong Kong, Dec. 7, 2000.
207. Invited Lecture Series, Chinese University of Hong Kong, Shatin, N.T., Dec. 8-15, 2000.

208. Symposium on PDE's in Biology, Joint Math Meetings, New Orleans, LA, Jan. 10-11, 2001.
209. SPIE Conference on Smart Structures and Materials, Newport Beach, CA, March 4-8, 2001.
210. Industrial Lecture Series, Univ. Wisconsin, Milwaukee, March 12-14, 2001.
211. Laboratoire d'Analyse Numerique, Univ. Paris VI, March 30, April 5,6, 2001.
212. Pi Mu Epsilon Banquet, Raleigh, NC, April 26, 2001.
213. Intl. Symp. on Electromagnetics X, Tokyo, Japan, May 13-16, 2001.
214. Plenary Lecture, Electromagnetic Nondestructive Evaluation 2001, Kobe, Japan, May 17-19, 2001.
215. SIAM Conf. on Dynamical Systems, Snowbird, Utah, May 21-24, 2001.
216. SIAM National Meeting (2 Invited Lectures), San Diego, CA, July 8-14, 2001.
217. 8th Int'l Conf. on Control of DPS, Graz, Austria, July 16-20, 2001.
218. DARPA Workshop on Uncertainty, Annapolis, MD, August 27-28, 2001.
219. SECAM (Southeast Conference on Applied Mathematics), Raleigh, NC, November 9-11, 2001.
220. IEEE Conf. on Decision and Control, Orlando, FL, December 3-7, 2001.
221. Plenary Lecture, Intl. Conf. on Inverse Problems, City University of Hong Kong, January 9-12, 2002.
222. Workshop on Electromagnetics, San Antonio, TX, January 17-19, 2002.
223. Entelos, Menlo Park, CA, February 15, 2002.
224. SPIE Conf. on Smart Materials, San Diego, CA, February 18-21, 2002.
225. Workshop on Computational Modeling in Science and Engineering, MCNC, RTP, March 25-26, 2002.
226. Plenary Lecture, South African Society for Numerical and Applied Math, 26<sup>th</sup> Annual Conf., Stellenbosch, S.A., April 3-5, 2002.
227. AFOSR Future Directions in Control, Arlington, VA, April 26-27, 2002.
228. Reid Prize Lecture, SIAM National Meeting, Philadelphia, PA, July 9, 2002.

- 229. Invited Symposium Lectures (2), [Bioterrorism; Electromagnetics], SIAM National Meeting, July 11, 2002.
- 230. ICASE 30<sup>th</sup> Anniversary Symposium, Newport News, VA, July 25, 2002.
- 231. MTNS, Notre Dame University, South Bend, IN, August 14-16, 2002.
- 232. Intl. Conf. on Computational Methods for Inverse Problems, Strobl, Austria, August 26-30, 2002.
- 233. Tutorials on Inverse Problems, SAMSI Inverse Problems Conference, RTP, NC, September 21-24, 2002.
- 234. ICAM Workshop on Control and Identification, VPISU, Blacksburg, VA, September 27-28, 2002.
- 235. Intl. Symposium on New Directions in Mathematical Systems Theory and Optimization, Royal Institute of Tech (KTH), Stockholm, Sweden, November 15-16, 2002.
- 236. Semester on Mathematical Control and Systems Theory, Institut Mittag-Leffler, Royal Swedish Academy of Sciences, Djursholm, Sweden, January 14-22, 2003.
- 237. Laboratoire Jacques-Louis Lions, Universite Paris 6, Paris, April 28, 2003.
- 238. Plenary Lecture, Intl. Conf. MAFELAP, Uxbridge, June 21-24, 2003.
- 239. Intl. Workshop on Viscoelastic Constitutive Modelling and Computation, Brunel University, June 25, 2003.
- 240. Invited Symposium Lectures (2) (Viscoelasticity; Industrial Math), ICIAM, Sydney, Australia, July 7-11, 2003.
- 241. Computation, Control and Biological Systems VIII, Montana State University, Bozeman, MT, July 29-August 1, 2003.
- 242. Joint Statistics Meetings, San Francisco, CA, August 3-7, 2003.
- 243. Plenary Lecture, Mathematics for Industry Workshop, 47th European Study Group with Industry, Univ. of Southern Denmark, Sonderborg, Denmark, August 24-29, 2003.
- 244. AFOSR Electromagnetics Workshop, San Antonio, January 8-10, 2004.
- 245. Distinguished Lecture Series in Mathematical Biology, U. Michigan, January 14-15, 2004.

246. Laboratoire Jacque-Louis Lions, Univ. Paris VI, March 1, 2004; Universite Jean Monnet, St. Etienne, March 4, 2004.
247. SPIE Conference on Control Systems, San Diego, March 15-19, 2004.
248. Universite Henri Poincare, Nancy, France, May 2, 2004.
249. Primary Lecturer, MAA PREP Series on "Mathematics Meets Biology: Epidemics, Data Fitting, and Chaos", University of Louisiana-Lafayette, May 26-29, 2004.
250. Plenary Lecture, Intl. Conference on Inverse Problems, Fethiye, Turkey, June 6-12, 2004.
251. Plenary Lecture, World Congress on Nonlinear Analysis, Orlando, FL, June 30-July 7, 2004.
252. Intl. Conf. on Research Trends in PDE Modeling and Computation, Brown University, November 7-8, 2004.
253. Distinguished Lecture Series, Clemson University, December 5-7, 2004.
254. AFOSR Electromagnetics Workshop, San Antonio, January 5-7, 2005.
255. Southwest Consortium for Theoretical, Computational and Mathematical Biology, Arizona State University, Tempe, January 14-15, 2005.
256. Plenary Lecture, International Conference on Approximation Methods for Design and Control, Universidad Tecnologica Nacional, Buenos Aires, Argentina, March 7-9, 2005.
257. Primary Lecturer, MAA PREP Short Course on "Mathematics Meets Biology", U. Louisiana-Lafayette, May 25-27, 2005.
258. Plenary Lecture, International Conference on Scientific Computing, Nanjing Normal University, Nanjing, China, June 4-8, 2005.
259. Plenary Lecture, Workshop on Control of Infinite Dimensional Systems, University of Waterloo, Waterloo, Canada, July 25-29, 2005.
260. Lecture series on Inverse Problems, Mathematical and Theoretical Biology Institute, Los Alamos National Laboratory, July 29-August 3, 2005.
261. Plenary Lecture, Workshop on Mathematics as an Enabling Science, VPISU, Blacksburg, VA, Sept 30-Oct 2, 2005.
262. AFRL/AFOSR Electromagnetics Workshop, San Antonio, January 11-13, 2006.

263. MAA Minicourse: "Mathematical and Statistical Modeling in Biology: Competitive Exclusion, Coexistence, Estimation and Control", Joint Math Meetings, San Antonio, January 12-15, 2006.
264. Workshop on Mathematical Models in Biology and Medicine, Tempe, AZ, February 3-4, 2006.
265. Invited Thematic Lecture, International Congress on the Applications of Mathematics-ICAM 2006, Center for Mathematical Modeling, University of Chile, Santiago, Chile, March 13-17, 2006.
266. Plenary Lecture, A. P. Calderon Seminar on Inverse Problems and Applications, 25th Anniversary of the Laboratorio Nacional de Computacao Cientifica, Rio de Janeiro, Brazil, March 21-24, 2006.
267. Invited Lecture, 3rd Intl. Conference on Inverse Problems: Modeling and Simulation Oludeniz, Fethiye, Turkey May 29-June 2, 2006.
268. Plenary Lecture, MAFELAP 2006, Brunel University, Uxbridge, England, June 13-16, 2006.
269. London Mathematical Society Distinguished Lecturer, Brunel, Reading, and Cardiff Universities, June 19-23, 2006.
270. Plenary Lecturer, 6th IFAC Workshop on Time-Delay Systems L'Aquila, Italy, July 10-12, 2006.
271. Lecture series on Mathematical and Statistical Methods in Inverse Problems, Mathematical and Theoretical Biology Institute, Arizona State University, Tempe, AZ, July 24-25, 2006.
272. Invited Lecture, 3rd International Conference on Neural, Parallel and Scientific Computation, Atlanta, GA, August 9-12, 2006.
273. Plenary Lecture, 8th Franco-Romanian Congres on Applied Mathematics, Chambéry, France, August 28-September 1, 2006.
274. Invited Lecture, Journee en Memoire du J.P. Kernevez, Universite de Technologie de Compiègne, Compiègne, France, October 2, 2006.
275. Plenary Lecture, 6th Red Raider Conference, Texas Tech University, Lubbock, TX, November 9-10, 2006.
276. AFRL/AFOSR Electromagnetics Workshop, San Antonio, January 9-11, 2007.
277. 2nd International Conference on Approximation Methods for Design and Control, Buenos Aires, Argentina, March 7-9, 2007.

278. Plenary Lecture, Atlantic Coast Conference on Mathematics in the Life and Biological Sciences, VPI, Blacksburg, VA May 3-5, 2007
279. Plenary Lecture, Intl Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE, Chicago, IL, June 20-23, 2007
280. Invited Principal Lecturer, 6th Congress of Romanian Mathematicians, Bucharest, June 28-July 4, 2007
281. Principal Lecturer (6 lectures), Biomedical Modeling and Cardiovascular-Respiratory Control: Theory and Practice Summer School and Workshop: A Marie Curie Training Event, Schloss Seggau, Leibnitz, Austria, July 22-28, 2007.
282. Plenary Lecture, Annual Meeting, Society of Mathematical Biology, San Jose, CA, July 30-August 3, 2007.
283. Plenary Lecture, 4th Danish Symposium on Applied Analysis, Copenhagen, August 16-18, 2007.
284. Plenary Lecture, Mathematical Modeling and Analysis of Populations in Biological Systems, Univ. of Arizona, Tucson, October 5-7, 2007.
285. Plenary Lecture, International Symposium on Mathematical Modeling and Computational Methods in Science and Engineering, Kobe, Japan, October 22-25, 2007.
286. "Frontiers in Environmental Sciences" Lecturer, NIEHS, RTP, December 7, 2007.
287. The Karen A. Ames Distinguished Lecturer, University of Alabama, Huntsville, February 8, 2008.
288. Plenary Lecture, Workshop on Modeling and Identification of Distributed Parameter Systems for Cell Population Dynamics, Leuven, Belgium, March 12-14, 2008.
289. Invited Lecture, 4th Intl. Conference on Inverse Problems: Modeling and Simulation Oludeniz, Fethiye, Turkey, May 26-30, 2008.
290. Invited Lecture, 10emes Recontres Mathematiques de Rouen (RMR) 2008, Rouen, France, June 25-27, 2008.
291. Keynote Lecture, World Congress on Nonlinear Analysis (WCNA2008), Orlando, FL, July 2-9, 2008.
292. Lecture series on "Inverse Problems: Mathematical and Statistical Methods", Mathematical and Theoretical Biology Institute, Arizona State University, Tempe, AZ, July 15-16, 2008.

293. Invited Lecture, Stochastic Differential Equation Models with Applications to the Insulin-Glucose System and Neuronal Modelling Summer School and Workshop: A Marie Curie Training Event, Middelfart, Denmark, August 12-16, 2008.
294. Invited Lecture, Workshop on Inverse and Partial Information Problems: Methodology and Applications, (October 27-31, 2008),(Special Semester on Stochastics with Emphasis on Finance Linz, September-December, 2008), RICAM, Linz, Austria.
295. Invited Lecture, Intl. Conf. on Approximation Methods for Design and Control, Buenos Aires, Argentina, March 9-11, 2009.

## **Service to Profession**

Reviewer for Mathematical Reviews, December 1967 - December 1974.

SIAM J. Control & Optimization

Editorial Board, July 1972 - December 1978

Managing Editor, January 1979 - December 1981

Editor, January 1982 - December 1985

Managing Editor, January 1986 - December 1988

Editor, January 1989 - December 1991

Consultant Board, NSF - Clemson University Project, 1975 - 1979,

“Alternatives to Graduate Education in the Math. Sciences”

Editorial Board, Quarterly of Applied Mathematics, August 1977 -

Editorial Board, J. Mathematical Biology, January 1980 - December, 1999.

Editorial Board, International J. Mathematical and Computer Modeling, January 1980

-

Editorial Board, Matematica Aplicada e Computational, May 1984 -December 2006.

Editorial Board, Applied Mathematics Letters, January 1987 -

Editorial Board, Control: Theory and Advanced Technology, January 1988 - December, 1994.

Editorial Board, J. Math. Systems, Estimation and Control, January 1990 - December, 1999.

Editorial Board, Discrete and Continuous Dynamical Systems, September 1994 - December, 2002; Series B, January 2000-December, 2004.

Editorial Board, ESAIM, Contrôle, Optimisation et Calcul des Variations, 1995 -2002.

Editorial Board, J. Inverse and Ill-Posed Problems, July 1996 -

Editorial Board, Inverse Problems, January 1997 - December, 2004; International Editorial Advisory Board, January 2005 -

Editorial Board, Intl. J. of Computational and Numerical Analysis and Applications, 2000 -

Editorial Board, Nonlinear Analysis: Real World Applications, January, 2000-

Editorial Board, Intl. J. of Pure and Applied Mathematics, 2001 -

Editorial Board, Communications in Applied Analysis, September, 2002 - December, 2007.

Mathematical Sciences Editor, J. Intelligent Material Systems and Structures, January 1992 - Dec. 1996; Associate Editor, January, 1997 -December, 2003.

International Advisory Editor, Arabian J. for Science and Engineering, 2003-2007; Editor, AJSE-Mathematics, 2007-

Advisory Editor, Mathematical Biosciences and Engineering, January, 2004-

Editorial Board, International J. for Rapid Publication in Mathematics, 2004-

AMS-SIAM Committee on Mathematics in the Life Sciences, January 1, 1981 - December 31, 1984

Vice President - Publications, SIAM, January 1, 1982 - December 30, 1985

Founding Editor, SIAM Book Series Frontiers in Applied Mathematics

Managing Editor, January 1983 - August 1985

Editorial Board, January 1983 - December, 1989.

Editor-in-Chief, January, 1998 - December, 2005.

Editorial Board, SIAM Series Advances in Design and Control, January, 1997 – December, 2005.

Editorial Board, ASA-SIAM Series on Statistics and Applied Probability, December, 2002–December, 2008.

Founding Editorial Board, Advances in Applied Mathematics and Mechanics (AAMM), October, 2008–

International Editorial Advisory Board, Inverse Problems in Science and Engineering, January, 2009–December, 2012.

Have served on International Program Committee for numerous meetings and conferences; most recent include 3rd IFAC Symposium on Control of Distributed Parameter Systems (Vice-Chairman), Toulouse, France, June 29 - July 2, 1982; Workshop on Control of Large Flexible Structures, Tampa, Florida, March 4-8, 1985; 4th IFAC Symposium on Control of Distributed Parameter Systems (Chairman), Los Angeles, June 30 - July 3, 1986; Seminar on Approximation and Optimization, Havana, Cuba, January 12-16, 1987; IMACS/IFAC International Symposium on Distributed Parameter systems (Co-Chairman), Hiroshima, Japan, October 6-9, 1987, numerous additional international program committees since 1987.

### **Service to Brown University**

Graduate Prelim Committee 1968-69 (Applied Mathematics)

Graduate Admissions Committee 1968-72 (Applied Mathematics)

Departmental Graduate Administrator 1969-72 (Applied Mathematics)

Graduate School Council 1970-72

Advisor, ScB. program in Applied Math-Biomedical Sciences, 1971 -

Advisor, AB program in Applied Mathematics, 1976-78

Search Committee for Faculty Position (Biomedical Sciences) 1976-78

Development of Vector I in Commonwealth Project, 1977 -

Executive Committee (Division of Applied Mathematics) 1981 - 82

Director, Lefschetz Center for Dynamical Systems, September - December 1981

Director, Center for Control Sciences, July 1986- July 1989

### **Honors and Awards**

2008 Alumni Association Outstanding Research Award, NCSU, March, 2008.

IEEE Lifetime Fellow, January, 2007–

President-Elect, Sigma Xi Research Society, 2006-2007; President, 2007-2008.

Turkish Governor's Medal of Honor Award (for outstanding research contributions), Intl. Conf. on Inverse Problems: Modeling and Simulation, Fethiye, Turkey, June 6, 2004.

"Bioterrorism: Mathematical Modeling Applications in Homeland Security", edited by H.T. Banks and Carlos Castillo-Chavez was chosen an alternate selection in the Scientific American Book Club's May 2004 cycle.

Chair, SIAM Activity Group on Control, 2002-2004.

W.T. & Idalia Reid Prize in Applied Mathematics, SIAM 50th Anniversary Meeting, Philadelphia, PA, July 9, 2002.

Best Paper Award, 158th Meeting, Rubber Division of American Chemical Society, Cincinnati, OH, October, 2000 (with O.H. Yeoh and G.A. Pinter).

Alumni Distinguished Graduate Professor, N.C. State University, May, 2000-

Fellow, Institute of Physics, 1999 -

Chair, SIAM Board of Trustees; elected, 1999; re-elected, 2000; re-elected, 2001; re-elected, 2002.

Distinguished Alumni Award, Purdue University, April, 1998.

SIAM Board of Trustees, January 1997 - 1999; re-elected, 2000 - 2002.

1996 IEEE-CSS Control Systems Technology Award, Kobe, Japan, Dec. 1996

1995-96 NCSU Alumni Association Outstanding Research Award

1995 ASME Adaptive Structures "Best Paper Award in Structural Dynamics and Control"; presented at the 1996 Adaptive Structures Forum, Salt Lake City, Utah, April, 1996 (with R.C. Smith and R. Silcox).

AFOSR Research Highlight, January, 1996.

IEEE Fellow, 1994 -

Distinguished Scholarly Achievement Award, N.C. State, 1992

University Professor, N.C. State, January 1992 -

AFOSR Research Achievement, 1990

J. Clarence Karcher Distinguished Lecturer Medal, 1985

Associate Member: The Institute for Computer Applications in Science and Engineering, 1985 -

Professeur Honoraire, Universite de Compiègne, France, 1977

NDEA and NSF Fellowships

Phi Kappa Phi, Blue Key, Pi Mu Epsilon, Sigma XI

### **Current Professional Societies**

SIAM (SIAG on Control, SIAG on Life Sciences), IEEE, Institute of Physics, Sigma Xi, Society for Math Biology

### **Past Research Interests**

1. Numerical methods for control problems: spline and other approximations.

2. Estimation techniques using parallel architectures and array processes.
3. Numerical methods for nonlinear systems control problems.
4. Estimation and control in distributed systems in: flexible structures; population dispersal; elasticity, acoustics.
5. Identification procedures for systems with delays.

## Teaching (Selected Courses)

1978-79	AM/Phy. 15, 16; AM 227A; Bio. 117, 212; AM 193, 194, 291, 292
1979-80	AM/Phy, 15, 16; AM 228; AM 291, 292
1980-81	AM/Bio. 107; AM 227, Bio. 212; AM 228; AM 291, 292
1981-82	AM/Phy. 15, 16; AM/Bio. 107; Bio. 212; AM 291-292
1984-85	AM/Bio. 107; AM 227, 228; AM 194; AM/Bio. 222
1985-86	AM 227, 228; AM 36
1986-87	AM/BIO 107; AM 36, AM 228, AM 222
1989-90 (at USC)	Ma 585 Topics in Control Theory
1990-91	Ma 685 Advanced Topics in Control
1991-92	Ma 425 Differential Equations for Engineers and Scientists
1992-93 (at NCSU)	Ma 341 Differential Equations
1993-94	Ma 531 Control and Systems Ma 581 Topics in the Applications of Mathematics
1994-95,1995-96	Ma 648 Applied Functional Analysis Ma 581 Modeling and Analysis of Physical and Biological Systems
1996-97	Ma 581 Topics in Computational Control Ma 573,574 Mathematical and Experimental Modeling of Physical Processes I,II
1997-98	Ma 648 Applied Functional Analysis Ma 573 Mathematical and Experimental Modeling of Physical Processes I
1998-99	Ma 648 Applied Functional Analysis Ma 797b Introduction to Computational Electromagnetics
1999-2000	Ma 797t Advanced Electromagnetics Ma 574 Mathematical and Experimental Modeling of Physical Processes II
2000-2001	Ma 573 Mathematical and Experimental Modeling of Physical Processes I (NC-REN TV) Ma 797I Statistical Methods for Inverse Problems
2001-2002	Ma 573 Mathematical and Experimental Modeling of Physical Processes I (NC-REN TV to Elizabeth City State Univ.; NCA&T; UNC-G; UNC-W)
2002-2003	Ma/St 810Q Statistical Methods in Inverse Problems Ma/St 810R Statistical Methods in Inverse Problems
2003-2004	Ma 573 Mathematical and Experimental Modeling of Physical Processes I (NC-REN TV to UNC-G; UNC-W) Ma 797B Special Topics in Applied Math
2004-2005	Ma 716 Advanced Functional Analysis Ma 810B Special Topics in Inverse Problems
2005-2006	Ma 797C Special Topics in Stochastic Modeling

- 2006-2007 Ma 797B Special Topics in Statistical and Mathematical Modeling  
 Ma 797V Special Topics in Viral Modeling
- 2007-2008 Ma 341 Intro to Ordinary Differential Equations
- 2008-2009 Ma 573 Mathematical and Experimental Modeling of Physical Processes I  
 Ma 797E Special Topics in Elasticity and Electromagnetics

### **Honors Theses Directed**

1. Carter, C.A., "Glucose Homeostatic Models", May 1972.
2. Kimura, R.E., "Numerical Methods for Approximating the Kinetics of Cascade Enzyme Systems", May 1972.
3. Almquist, K., "An Optimal Control Model in Radiation Biology", May 1974.
4. Zinberg, D., "Numerical Methods for Stiff Systems Arising in Enzyme Cascade Models", May 1974.
5. Thrift, P., "A Computer Program for the Approximation of Solutions to Optimal Control Problems Governed by Time-Lag Systems", May 1975.
6. Mills, E., "Use of the STAR ST-100 Array Processor in a Numerical Optimization Method", May 1985.
7. Askew, A., "Size structured population models", May 1988.

### **Graduate Theses Directed**

1. Latina, M.R., "Some Aspects of Mathematical Control Problems with Time-Dependent Control Constraints", MS Thesis, Brown University, 1970 (Professor, Worcester Polytech).
2. Kent, G.A., "Optimal Control of Functional Differential Equations of Neutral Type", PhD Thesis, Brown University, 1971 (Lt. Commander, U.S. Navy).
3. Groome, G.M., Jr., "Identification of Dynamical Systems", PhD Thesis, Brown University, 1972 (Management, IBM Corp.).
4. Tsukazan, T., "Existence of Optimal Controls for Problems Involving Systems with Delays", PhD Thesis, Brown University, 1974 (Univ. Rio del Sol, Brazil).
5. Reber, D., "Approximation and Optimal Control of Linear Hereditary Systems", PhD Thesis, Brown University, 1978 (private business).

6. Mahaffy, J., "Models for Protein Synthesis", PhD Thesis, Brown University, 1979 (Professor, San Diego State Univ.).
7. Rosen, G., "A Discrete Approximation Framework for Hereditary Systems", PhD Thesis, Brown University, 1980 (Professor, Univ. So. California).
8. Daniel Lamm, P., "Spline-Based Approximation Methods for the Identification and Control of Nonlinear Functional Differential Equations", PhD Thesis, Brown University, 1981 (Professor, Michigan State Univ.).
9. Rockey, S., "Discrete Methods of State Approximation, Parameter Identification and Optimal Control for Hereditary Systems", PhD Thesis, Brown University, 1981 (Law Firm: Ecklund, Rockey and Stratton, Seattle, WA).
10. Crowley, J., "Numerical Methods of Parameter Identification for Problems Arising in Elasticity", PhD Thesis, Brown University, 1982 (Managing Director, SIAM).
11. Murphy, K.A., "A Spline-Based Approximation Method for Inverse Problems for a Hyperbolic System Including Unknown Boundary Parameters", PhD Thesis, Brown University, 1983 (Associate Professor, Univ. North Carolina -CH).
12. Zia, L., "Parameter Estimation Techniques for Two-Dimensional Transport Equations with Application to Models of Insect Dispersal", PhD Thesis, Brown University, 1985 (Associate Professor, Univ. New Hampshire).
13. Fitzpatrick, B., "Statistical methods in parameter identification and model selection", PhD Thesis, Brown University, 1988 (Partner and Staff Scientist, Tempest Technologies, Burbank, CA and C.J. Wallen Professor of Mathematics, Loyola Marymount University).
14. Wang, C., "Approximation methods for linear quadratic regulator problems with nonautonomous periodic parabolic systems", PhD Thesis, Brown University, 1988 (Associate Professor, Univ. So. California).
15. Wade, G. "Tau methods for parabolic equations in inverse problems", PhD Thesis, Brown University, 1989 (Associate Professor, Bowling Green State Univ.).
16. Rebnord, D. "Parameter estimation for two-dimensional grid structures", PhD Thesis, Brown University, 1989 (Senior Financial Engineer, Nations Bank, Chicago).
17. Wang, Y. "Damping modeling and parameter estimation in Timoshenko beams", PhD Thesis, Brown University, 1991 (Staff Scientist, Xontech Corp., Burbank, CA).
18. Fakhroo, F. "Legendre-Tau approximation for an active noise control problem", PhD Thesis, Brown University, 1991 (Associate Professor, Naval Postgraduate School).

19. Smith, Christian, "Modeling and analysis of coupled torsion and bending in flexible structures", PhD Thesis, University of Southern California, 1993 (Research Engineer, CSA Engineering, Palo Alto, CA).
20. Zhang, Yue, "Mathematical formulation of vibrations of a composite curved beam structure: Aluminum core material with viscoelastic layers, constraining layers and piezoceramic patches", Ph.D Thesis, North Carolina State University, 1997 (Staff Scientist, Michelin North America Research Center, Greenville, S.C.).
21. Musante, Cynthia, "A distributed parameter model to describe the hepatic processing of 2,3,7,8-Tetrachlorodibenzo-p-dioxin", Ph.D. Thesis, North Carolina State University, 1998 (Staff Scientist, Entelos, Palo Alto, CA).
22. del Rosario, Ric, "Computational methods for feedback control in structural systems", Ph.D. Thesis, North Carolina State University, 1998 (Assistant Professor, University of the Phillipines, Manila).
23. Buksas, Michael, "Modeling, analysis and implementation of forward and inverse problems in one dimensional electromagnetic scattering with differential and hysteretic polarization models", Ph.D. Thesis, North Carolina State University, 1998 (Research Scientist, Los Alamos National Lab, Los Alamos, NM).
24. Choi, Melissa Goodhart, "Analysis and implementation of a model for radio-frequency bonding of adhesives in composites", Ph.D. Thesis, North Carolina State University, 1999 (Staff Scientist, MIT Lincoln Labs).
25. Potter, Laura K., "Physiologically based pharmacokinetic models for the systemic transport of trichloroethylene", Ph.D. Thesis, North Carolina State University, 2001 (Staff Scientist, EPA, Durham, NC).
26. Joyner, Michele L., "An application of a reduced order computational methodology for eddy current based nondestructive evaluation techniques", North Carolina State University, 2001 (Staff Scientist, MIT Lincoln Labs).
27. Bihari, Kathleen L., "Analysis of thermal conductivity in composite adhesives", Ph.D. Thesis, North Carolina State University, 2001 (Staff Scientist, MIT Lincoln Labs).
28. Ditter, Emily E., "Representation of nasal airways using proper orthogonal decomposition", MS Thesis, North Carolina State University, 2001 (Staff Scientist, John Hopkins Applied Physics Lab).
29. Raye, Julie K., "An electromagnetic interrogation technique utilizing pressure-dependent polarization", Ph.D. Thesis, North Carolina State University, 2002 (Assistant Professor, Virginia Commonwealth University, Richmond, VA).

30. Bortz, David M., "Modeling analysis and estimation of an in vitro HIV infection using functional differential equations" Ph.D. Thesis, North Carolina State University, 2002 (Assistant Professor, University of Michigan, Ann Arbor, MI).
31. Smith, Cassandra J., "Adapting a passive computational model for sound field absorption by acoustic arrays into an active model" MS Thesis, North Carolina State University, 2003 (Staff Scientist, MIT Lincoln Labs).
32. Gibson, Nathan Louis, " Terhertz based electromagnetic interrogation techniques for damage detection" Ph.D. Thesis, North Carolina State University, 2004 (NIA/CRSC Postdoctoral Fellow, National Institute of Aerospace, Hampton, VA).
33. Dick, Lara K., "Prediction of life history traits in invertebrate species exposed to pesticides", MS Thesis, North Carolina State University, May, 2005 (Broughton High School, Raleigh, NC).
34. Adams, Brian Michael, "Non-parametric parameter estimation and clinical data fitting with a model of HIV infection", Ph.D. Thesis, North Carolina State University, July, 2005 (Sandia National Labs, Albuquerque, NM)
35. Hood, Jeffrey Braidon, "Molecular-based models for viscoelasticity of polymers", Ph.D. Thesis, North Carolina State University, July, 2005 (Assist. Prof., Midwestern State University, Wichita Falls, TX).
36. Luke, Nicholas Stephen, "Modeling shear wave propagation in biotissue: An internal variable approach to dissipation", Ph.D. Thesis, North Carolina State University, July, 2006 (Environmental Protection Agency, RTP, NC)
37. Grove, Sarah Lynn, "Optimization problems in the presence of uncertainty", Ph.D. Thesis, North Carolina State University, September, 2007 (Air Force Research Laboratory, Rome, NY)
38. Joyner, Sarah Lynn, "Dynamic models for insect mortality due to exposure to insecticides", MS Thesis, North Carolina State University, March, 2008 (Consulting analyst, Accenture, Charlotte, NC)
39. Samuels, John R., "Inverse problems and post analysis techniques for a stenosis-driven acoustic wave propagation model", Ph.D. Thesis, North Carolina State University, June, 2008 (Soneticom, Melbourne, FL)
40. Davis, Jimena Lamanda , "Uncertainty quantification in the estimation of probability distributions on parameters in size-structured population models", Ph.D. Thesis, North Carolina State University, July, 2008 (National Center for Computational Toxicology, US EPA, RTP, NC)

41. Ernstberger, Stacey Leigh, "Sensitivity methods for dynamical systems", Ph.D. Thesis, North Carolina State University, July, 2008 (LaGrange College, LaGrange, GA)

### **Postdoctorals Directed**

A partial list (with current employment) includes:

1. J. Burns, 1973-1974 (Hatcher Chair in Mathematics, VPISU);
2. F. Colonius, 1977-1978 (Univ. of Augsburg);
3. K.Kunisch, 1979-1980 (Professor, Univ Graz, Austria);
4. K. Ito, 1981-1984 (Professor, N.C. State Univ.);
5. G. Propst, 1985-1987 (Associate Professor, Universitat Graz, Austria);
6. F. Kojima, 1985-1988 (Professor, Kobe University, Japan);
7. R. Fabiano, 1986-1989 (Professor, Univ. N.C.,Greensboro);
8. H. Tran, 1986-1989 (Professor, N.C. State Univ.);
9. S. Keeling, 1987-1988 (Visiting Scientist, Univ. Graz, Austria);
10. D. Woodward, 1988-1989 (SMU);
11. R. Miller, 1989-1992 (Staff Scientist, Beam Tech. Inc.);
12. S. Kang, 1989-1992 (Chosun University, Korea);
13. K. Morris, 1989-1990 (Professor, University of Waterloo);
14. R. Smith, 1990-1993 (Professor, N.C. State Univ.);
15. W. Fang, 1990-1992 (Associate Professor, West Virginia Univ.);
16. B. King, 1992-1993 (Professor, Oregon State University);
17. K. Black, 1992-1994 (Associate Professor, Cooper Union);
18. M. Demetriou 1993-1996 (Associate Professor, WPI);
19. N. Lybeck, 1995-1997 (Staff Scientist, Applied Math Inc.);
20. G. Kepler, 1995-2000 (SAMSI Associate Fellow);
21. P. Emeric, 1996-1998 (GE Systems);

22. H. V. Ly, 1996-1999 (Associate Professor, California State - Fullerton);
23. I. Groselj, 1997-1998 (Germany);
24. D. Rubio, 1997-1999 (University of Buenos Aires Hospital, Argentina);
25. G. Pinter, 1997-2000 (Associate Professor, University of Wisconsin - Milwaukee);
26. S. Wynne, 1999-2002 (CRSC Research Scientist);
27. B. Browning, 2000-2002 (Staff Scientist, Glaxo-Smith-Kline);
28. J. Bardsley, 2002-2003 (SAMSI Fellow) (Assist. Prof., University of Montana);
29. Y. Ma, 2002-2004 (SAMSI/CRSC Fellow) (Assist. Professor of Statistics, Texas A and M University);
30. V. Bokil, 2003-2006 (Assist. Professor, Oregon State University)
31. H.D. Kwon, 2003-2004 (Asst. Professor, Inha University, Korea);
32. H.K. Nguyen, 2004-2006 (SAMSI/CRSC Fellow) (Staff Scientist, Center for Naval Analysis);
33. N. Gibson, 2004-2006 (NASA-NIA Fellow) (Assist Professor, Oregon State University);
34. Shuhua Hu, 2005-;
35. Sava Dediu, 2005-2008 (SAMSI/CRSC Fellow) (Scientist, Campbell & Co.);
36. Ariel Cintron-Arias, 2006- (SAMSI/CRSC Fellow);
37. Karyn L. Sutton, 2008-.

## Professional References

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