Curriculum Vita

NAME I. Gary Rosen

POSITION Gabilan Distinguished Professor in Science and Engineering,
and Professor of Mathematics
Department of Mathematics
University of Southern California
Los Angeles, CA 90089

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PERSONAL DATA

Birthdate: February 19, 1954
Birthplace: Long Beach, New York

EDUCATION

June 1980 Ph.D. in Applied Mathematics, Brown University, Providence, RI

Dissertation: "A Discrete Approximation Framework for Hereditary Systems"
Advisor: Professor H.T. Banks

June 1976 Sc.M. in Applied Mathematics Brown University Providence, RI
June 1975 Sc.B. in Mathematics, Brown University, Providence, RI

EMPLOYMENT

2020 – 2023 Gabilan Distinguished Professorship in Science and Engineering
1993 - present Professor of Mathematics, University of Southern California.
2005 – 2011 Chair, Department of Mathematics, University of Southern California
1999 - 2000 Consultant, D-Star Technologies.
1996 - 2000 Consultant, Stone Lions Environmental Corporation.
1991 - 1993 Consultant, Lucas Western Inc., Electro Systems Division, Division of Lucas Aerospace, Brea, CA
1987 - 1993 Associate Professor of Mathematics, University of Southern California.

1984 - 1987	Assistant Professor of Mathematics, University of Southern California.
1983 - 1985	Member of Technical Staff/Consultant, The Charles Stark Draper Laboratory, Cambridge, MA.
1980 - 1984	Assistant Professor of Mathematics, Department of Mathematics, Bowdoin College, Brunswick, ME.
1981 - 1990	Consultant, Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research Center Hampton, VA.
1981, 1982 Summer	Visiting Scientist, Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research Center, Hampton, VA.
1976 - 1980	Research and Teaching Assistant, Division of Applied Mathematics, Brown University.
1977 Summer	Research Assistant, Department of Geological Sciences, Brown University.

DEPARTMENTAL and COMMUNITY SERVICE

2018 -	Member, WiSE Advisory Board
2013 – 2018	Member, WiSE Dornsife Advisory Committee
2016 -	Member, Provost's Oversight Committee on Academics and Athletics
2005 – 2011	Chair, Department of Mathematics, University of Southern California
2001 - 2007	Associate Editor IEEE Transactions on Control Systems Technology.
2001 - 2007	Associate Editor IEEE Control Systems Society Conference Editorial Board.
1998 – 2002	Associate Director, Center for Applied Mathematical Sciences (CAMS), Department of Mathematics, University of Southern California.
2000 – 2005	Vice-Chairman for Graduate Studies, Department of Mathematics, University of Southern California.
1990 – 1996, 2000 - 2005	Vice-Chairman for Applied Mathematics, Department of Mathematics, University of Southern California.

PROFESSIONAL ACTIVITIES

Invited Participant, Workshop on Control and Identification of Distributed Parameter Systems. Institute for Computer Applications in Science and Engineering (ICASE), NASA Langley Research Center, Hampton, VA. April 6-10, 1981.

Invited Speaker, Mini-symposium on Control Stabilization and Estimation of Distributed Systems. Society for Industrial and Applied Mathematics (SIAM) national meeting, Stanford, CA. July 19-23, 1982.
Invited Speaker, The University of Arkansas Annual Lecture Series in the Mathematical Sciences: The Estimation and Control of Distributed Systems, Fayetteville, Arkansas, April 12-14, 1984.

Invited Participant, Workshop on Control Systems Governed by Partial Differential Equations with Application to Large Flexible Structures, The

Pennsylvania State University, Clearwater, FL, March 4 - 8, l985.

Invited Speaker, Applied Mathematics Seminar, Department of Mathematics, Harvey Mudd College, Claremont, CA., January 31, 1986.

Invited Speaker, Control Systems Seminar, Departments of Mathematics and Electrical Engineering, The Institute of Technology, University of Minnesota, Minneapolis, MN, June 5, l986.

Invited Speaker, Conference on Control and Indentification of Distributed Systems, The Institute of Mathematics of the University of Graz, Vorau, Austria, July 6 - 12. l986.

Invited Speaker and Session Chairman, Meeting of the Society for Engineering Science, State University of New York at Buffalo, Buffalo, NY, August 25-27, l986.

Invited Participant, Second Workshop on the Control of Systems Governed by Partial Differential Equations sponsored by AFOSR, NSF and the University of Montreal, Val David, Quebec, Canada, October 5 - 9, 1986.

Invited Speaker, Control Systems Seminar, Department of Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, CA, October 27, 1986.

Invited Speaker, IFIP Conference on Optimal Control of Systems Governed by Partial Differential Equations, Santiago de Compostela, Spain, July 6-9, 1987.

Speaker and Invited Session Chairman, IMACS/IFAC International Symposium on Modelling and Simulation of Distributed Parameter Systems, Hiroshima, Japan, October 6-9, 1987.

Session Organizer and Chairman, 26th IEEE Conference on Decision and Control, Los Angeles, CA, December 9-11, 1987.

Invited Speaker, Fourth International Conference on Control and Identification of Distributed Systems, Vorau, Austria, July 10-16, 1988.

Invited Participant, Workshop on Computational and Experimental Aspects of Control, University of Wisconsin, Madison, May 16-18, 1988.

Invited Participant and Speaker, Workshop on Computational Aspects of Identification and Control of Distributed Parameter Systems, Brown University, August 11-26, 1988.

Invited Speaker, Special Session on Differential and Difference equations, AMS Regional meeting, Claremont, CA, Nov. 12 and 13, 1988.

Session Organizer and Chairman, 27th IEEE Conference on Decision and Control, Austin, Texas, Dec. 7 - 9, 1988.

Invited Paper, SIAM conference on Control in the 90's, San Francisco, CA, May 17-19, 1989.

Invited Paper, 1989 American Control Conference, Pittsburgh, PA, June 21-23, 1989.

Invited Paper, 5th IFAC Symposium on Control of Distributed Parameter Systems, Perpignan, France, June 26-29, 1989.

Invited Paper, 3rd Annual NASA/NSF/DOD Conference on Aerospace Computational Control, Oxnard, CA, Aug 28-30, 1989.

Invited Paper , Fifth International Conference on Control and Identification of Distributed Parameter Systems, Vorau, Austria, July 9-13, 1990.

Invited Papers (2), SIAM Annual Meeting, Chicago, IL, July 16-20, 1990.

Invited Speaker, Interdisciplinary Center for Applied Mathematics, Department of Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 18, 1990.

Invited Speaker, Workshop on Problems in Sensing, Identification, and Control of Flexible Structures, Fields Institute, University of Waterloo, Waterloo, Ontario, Canada, June 28-30, 1992.

Invited Speaker, Control Theory Seminar, Department of Electrical Engineering, University of California, Santa Barbara, October 6, 1992.

Invited Speaker, Special Session on Riccati Equations and Transport Theory, 876th meeting of the American Mathematical Society (AMS) Dayton, Ohio, October 30 - November 1, 1992.

Invited Speaker, Conference on Evolution Equations, Department of Mathematics, Louisiana State University, Baton Rouge, Louisiana, January 7-11, 1993.

Invited Speaker, International Conference on Control and Estimation of Distributed Parameter Systems: Nonlinear Phenomena, Vorau, Austria, July 18 - July 24, 1993.

Invited Speaker, Nonlinear Analysis Seminar, Humboldt University, Berlin, Berlin, Germany, July 15, 1993.

Invited Speaker, Applied Mathematics Seminar, Department of Math. Michigan State University, East Lansing, MI, October 11, 1993.

Invited Speaker, Control Theory Seminar, Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, October 12, 1993.

Invited Speaker, NOSC Naval Research Center, San Diego, CA, November 29, 1994.

Invited Speaker, Department of Mathematics, University, of California, Irvine, CA, January 17, 1995.

Invited Speaker, IFIP Conference on Optimal Control: Theory, Algorithms and Applications, University of Florida, Gainsville, FL, February 27, 28 and March 1, 1997.

Invited Speaker, Fifth IEEE Mediterranean Conference on Control and Systems, July 21-23, 1997, Paphos, Cyprus.

Invited Speaker, Sixth IEEE Mediterranean Conference on Control and Automation, June 9-11, 1998, Alghero, Sardinia, Italy.

Invited Speaker, Conference on Control of Distributed Parameter and Stochastic Systems, June 19-22, 1998 Hangzhou, China.

Invited Speaker, Seventh IEEE Mediterranean Conference on Control and Automation, June 28-30, 1999, Haifa, Israel.

Invited Speaker, Departmental Colloquium, Department of Mechanical Engineering, Worcester Polytechnic Institute, Worcester, Massachusetts, December 2, 1999.

Invited Speaker, Eighth IEEE Mediterranean Conference on Control and Automation, July 17-19, 2000, Athens, Greece.

Invited Speaker, Computation and Control VII, Montana State University, August 1-4, 2000.

Invited Speaker, Conference on Future Directions in Distributed Parameter Systems, North Carolina State University, October 5-7, 2000.

Invited Speaker, ICAM Seminar, Virginia Tech, Blacksburg, VA, October 10, 2000.

Featured Speaker, First Annual Southern California Applied Mathematics Symposium, California Institute of Technology, Pasadena, CA, May 12, 2001.

Invited Participant, NIAAA Workshop on the Design of an Integrated Alcohol Sensing and Data Analysis System, Washington, D.C., May 22, 23 2001.

Invited Speaker, SIAM Minisymposium on Modeling and Simulation for Thin Films, Joint Mathematics Meetings, San Diego, CA, Jan 6-11, 2002.

Invited Speaker, Tenth IEEE Mediterranean Conference on Control and Automation, July 9-12, 2002, Lisbon, Portugal.

Invited Speaker 2002 Mardi Gras Meeting on Nanotechnology at the Interface of Information Technology, February 7-9, 2002, Baton Rouge, LA

Invited Participant 2003 SAMSI Inverse Problem Closing Workshop, May 14-15, 2003, Raleigh, NC

Invited Participant NIAAA (NIH) Alcohol Biosensor Kick-Off Meeting, May 21-23, 2003, Bethesda, MD.

Invited Speaker Semi Annual MURI 99 GAIM Reviews, November 21,22 2002 and August 27, 28 2003, Manhattan Beach CA and Park City UT.

Poster Session, The Mathematical Modeling and Deconvolution of Blood Alcohol Level from Transdermal Alcohol Sensor Provided Skin Surface Ethanol Measurements, 2002 Meeting of the Research Society on Alcohol, San Francisco, CA, June, 2002

Poster Session, Development of a Mathematical Model for the Consumption, Metabolism, and Transdermal Excretion of Alcohol, 2004 Meeting of the Research Society on Alcohol, Vancouver, BC, June, 2004

Invited Speaker, An Integrated Transdermal Alcohol Sensor and Data Analysis System, LAS Faculty Lunch Lecture Series, January 19, 2005.

Poster Session, Mathematical Models for the Pharmacokinetics and Transport of Transdermal

Alcohol: Determining BAC Using a New Transdermal Alcohol Biosensor and Mathematical Modeling, 2005 Meeting of the Research Society on Alcohol, Santa Barbara, California, June, 2005.

Invited Speaker, NIAAA (NIH) Alcohol Biosensor Development Program Review, July 2005, Bethesda, MD.

Invited Speaker, Cognitively Augmented Design – Quantum Technology Program, Annual Grantee Review, Optimal Design of Nanoscale Layered Electronic Devices, January 18-18, 2006, Los Angeles, CA.

Symposium Organizer and Presenter, SIAM Conference on Control and its Applications, Optimization Problems in Electromagnetic, Electronic and Photonic Device Design, San Francisco, CA, June 2007

Poster Session, A Population Analysis Based Approach for Estimating BAC from Transdermal Ethanol, 2007 Meeting of the Research Society on Alcohol, Chicago, IL, July, 2007.

Symposium Organizer and Speaker, Sixth International Congress on Industrial and Applied Mathematics, Optimal Control, Estimation, and Design for Systems Governed by Partial Differential Equations: Theory and Computational Methods, Zurich, Switzerland, July, 2007.

Poster Session A Population Analysis and Bayesian Approach to the Deconvolution of Blood Alcohol Concentration from Transdermal Ethanol, Meeting of the Research Society on Alcohol, San Diego, California, June, 2009.

Symposium Organizer, Fifth Conference on Applied Inverse Problems, Vienna, Austria, July, 2009.

Speaker, Fifth Conference on Applied Inverse Problems, Vienna, Austria, July, 2009, Title: Approximation in the Deconvolution of Drinking Behavior from Transdermal Alcohol Biosensor Data.

Invited Speaker, The Second Monterey Workshop on Computational Issues in Nonlinear Control, Monterey, California, November 7 and 8.

Invited Speaker, Department Controls Seminar, Department of Aerospace Engineering, Worcester Polytechnic University, October 12, 2011.

Invited Speaker, Minisymposium on Control and Estimation of Distributed parameter Systems, Determining Blood and/or Breath Alcohol Concentration from Transdermal Alcohol Data, 2013 American Control Conference, Washington DC, June 17-19, 2013

Minisymposium Organizer, Optimization and Control of Systems Governed by Partial Differential Equations, (with C. Wang) 2013 SIAM Conference on Control and its Applications, San Diego, CA, July 8-10,2013

Minisymposium Organizer, Inverse Problems for Distributed Parameter Systems, (with C. Wang) 2013 SIAM Conference on Control and its Applications, San Diego, CA, July 8-10,2013

Poster Presentation, Using Drinking Diary Data to Calibrate Software for Estimating Blood Alcohol Concentration From Field Collected Transdermal Ethanol Sensor Data (with K. Coste and S. E. Luczak), 2013 National meeting of Research Society on Alcohol, Orlando, FL, June 22-26, 2013.

Speaker, Discrete-Time Blind Deconvolution for Distributed Parameter Systems with Dirichlet Boundary Input and Unbounded Output with Application to a Transdermal Alcohol Biosensor, 2013 SIAM Conference on Control and its Applications, San Diego, CA, July 8-10,2013.

Invited Speaker, A First Principles, Mathematical Model Based, Data Analysis System for converting Transdermal Alcohol Concentration into either Blood or Breath Alcohol Concentration, Brown University Alcohol Research Center on HIV, Brown University School of Public health, Providence, RI, August 7, 2103.

Poster Presentation, Creating an Automated Drinking Episode Identifier Software Program Utilizing Transdermal Alcohol Sensor Data from Real-Time Drinking Episodes (with J. Weiss, T. L. Wall, and S. E. Luczak), 2014 National Meeting of Research Society on Alcohol, Bellevue, Washington, June 21-25, 2014.

Invited Speaker, Minisymposium on Control and Estimation of Distributed parameter Systems, Estimation of Parameters in a Distributed Parameter Model for Thin Film Layered Organic Photovoltaic Cells, 2014 American Control Conference, Portland, OR, June 4-6, 2014.

Contributed Paper, Forecasting Ionospheric Space Weather Due To High Speed Streams (with O. Verkhoglyadova, X. Meng, B. Tsurutani, X. Pi, E. Lynch, A. Ridley,W. Manchester, C. Wang, and A. Mannucci, Fall 2014 American Geophysical Union Fall Meeting, San Francisco, California, December 15-19, 2014.

Invited Speaker, Claremont Colleges Mathematics Colloquium, Determining What you Drank from What You Sweat, Claremont Colleges, October 8, 2014.

Contributed Paper, Scientific Aspects of Forecasting Ionospheric Space Weather (with O. Verkhoglyadova, X. Meng, B. Tsurutani, X. Pi, E. Lynch, A. Ridley,W. Manchester, C. Wang, and A. Mannucci), American Meteorological Society's 12th Conference on Space Weather as part of the 95th American Meteorological Society Annual Meeting, Phoenix, AZ., Jan 4-8, 2015.

Poster Presentation, Calibrating Nonlinear Models that Estimate Breath Alcohol Concentration from Transdermal Alcohol Sensor Data by Using Drinking Diary Data, (with Z. Dai and S. E. Luczak), 2015 National Meeting of Research Society on Alcohol, San Antonio, TX, June 20-24, 2015.

Poster Presentation, The Transdermal Alcohol Sensor Macro (TASMAC): A Rapid Data Processing Tool for Use with the SCRAMx Alcohol Sensor (with N. P. Barnett, T. Souza, T. R. Glynn, S. Luczak, and R. Swift), 2015 National Meeting of Research Society on Alcohol, San Antonio, TX, June 20-24, 2015.

Poster Presentation, A Hybrid Passive/Active Transdermal Alcohol Sensor, Monitoring, and Processing System: Integrating the SCRAM Sensor, the IntelliDrink IPhone App and the BrAC Estimator Software, (with A. L. Hawkins, R. Wichmann, and S. E. Luczak), 2016 National Meeting of Research Society on Alcohol, New Orleans, LA, June 25-29, 2016.

Contributed Paper, Data Mining Approach for Forecasting Ionosphere Anomalies Using Solar and Space Observations, (with C. Wang, S. Li, B. T. Tsurutani, O. Verkhoglyadova, X. Meng, and A.J. Mannucci, 97th American Meteorological Society Annual Meeting, Seattle, WA, Jan 22-26, 2017.

Poster Presentation, On the Modeling and Deconvolution of Blood or Breath Alcohol Concentration (BAC/BrAC) from Biosensor-Measured Transdermal Alcohol Concentration (TAC) (with J. Li and S. Luczak), 2017 National Meeting of Research Society on Alcohol, Denver, Co, June 24-28, 2017.

Poster Presentation, On Estimating Breath Alcohol Concentration (BrAC) and Associated Credible Bands From Measurements of Transdermal Alcohol Concentration from (TAC) Using Aggregate Data-Based Population Models (with M. Sirlanci and S. Luczak), 2018 National Meeting of Research Society on Alcohol, San Diego, CA, June 16-20, 2018.

Invited Speaker, Special Session on Control and Estimation of Random Partial Differential Equations, Estimating the Distribution of Random Parameters in, and Deconvolving the Input Signal to, a Diffusion Equation Forward Model for a Transdermal Alcohol Biosensor, SIAM Conference on Uncertainty Quantification, April 16-19, Garden Grove, California, 2018.

Poster Presentation, : Introducing the Alcohol Concentrations Simulator: A drinking Diary-Driven Blood, Breath, and Transdermal Alcohol Concentration Simulation Tool for the BrAC Estimator Software, (with M. Allayioti, J. Bartroff, Z. Dai, L. Goldstein, K. Hawekotte, N. Lee, S. Li, C. Wang, T. Shah, R. Hu, and S. Luczak), 2019 National Meeting of Research Society on Alcohol, Minneapolis, MN, June 22-26, 2019.

Poster Presentation, : Obtaining High-Resolution Multi-Biosensor Data for Modeling Transdermal Alcohol Concentration Data (E.B. Saldich, C. Wang, and S.E. Luczak), 2020 National Meeting of Research Society on Alcohol, New Orleans, LA, Held virtually due to Covid-19 June 22-24, 2020.

MASTERS THESES SUPERVISED

1985	M. Kern	Computational Methods for Functional Approximation Using Variable Knot Splines.
1986	I. Erbas	Two Film Transport of Organic Contaminants in Ground Water.
	M. Lie	Computational Methods for the Solution of Ininite Dimensional Discrete-Time Regulator Problems with Unbounded Input.
	Y. Wang	An Inverse Problem for a Flexible Structure
1988	C. Lo	An Implementation of a Computational Technique for the Identification of Nonlinear Distributed Parameter Systems.
1990	R. Csipke	Approximation in the Identification of Time Varying Parameters in Distributed Parameter Systems.
	F. Su	Approximation in the Estimation of Thermoelastic Damping in Structures.
	G. Tao	Approximation in Control of Thermoelastic Systems.
	J. Heisler	Existence Theory of Stationary Viscous Flow Through an Unbounded Channel.
	P. Raghu	A Computational Method for Parameter Identification in Degenerate Distributed Parameter Systems.
1991	C. Cressler	Approximation in the Solution of the Optimal Linear Quadratic Regulator Problem for Infinite Dimensional Systems.
1997	M. Busson	A Model Reference Adaptive Control Scheme for Linear Delay Systems.
	F. Jahani	A Moving Boundary Model of Concrete Sewer Pipe Corrosion.
2002	R. Mancera	Model Validation and Control Simulation of Thermal Chlorine Etching of Gallium Arsenide.
	R. Kamuth	Computer Simulation and Control for Production of an Ideal Diffraction Pattern in Optical Fibers
2013	K. Coste	Calibrating a Model for the Transdermal Transport of Alcohol Using Drinking Diary Data
2014	Z. Dai	Identifying Drinking Diary Based Pharmacokinetic Models to Calibrate Transdermal Alcohol Biosensor Data Analysis Software
2017	J. Li	Distributed Parameter Model Based System Identification and Filtering in the Estimation of Blood Alcohol Concentration from Transdermal Alcohol Biosensor Data

Ph. D. THESES SUPERVISED

1991	C. Mao	An Approximation Theory for the Identification of Nonlinear Degenerate Distributed Parameter Systems.
1993	M. Demetriou	Adaptive Parameter Estimation for Abstract Parabolic and Hyperbolic Distributed Parameter Systems. (with P. Ioannou)
1994	K. Hamdan	The Linear Quadratic Regulator Problem for Thermoelastic Systems with Boundary Control and Unbounded Observations.
1995	P. Raghu	Approximation in the Identification of Second Order Degenerate Distributed Parameter Systems.

	J. Kazimir	Adaptive Parameter Estimation for Evolution Equations in Hilbert Space.
1999	F. Jahani	Mathematical Modeling of Microbially Induced Crown Corrosion in Wastewater Collection Systems and Laboratory Investigation and Modeling of Sulfuric Acid Corrosion of Concrete. (with J. Devinny)
2003	T. Parent	Real-Time Supervisory Control of Semiconductor Etching Processes. (with A. Madhukar)
2006	T. Wang	Approximation and Parameter Estimation for a Nonlinear Reaction-Diffusion System modeling the Metabolism and Transport of Alcohol in the Human Body.
	A. Shamam	Fully Discrete Approximation for Parameter Estimation in Abstract Parabolic Distributed Parameter Systems
2008	A. Lytvak	Parameter Estimation for the Black-Scholes Model in Mathematical Finance
2009	Y. Piterbarg	Population Modeling and Bayesian Estimation for the Deconviolution of Blood Alcohol Concentration from Transdermal Alcohol Biosensor Data (with A. Schumitzky)
2018	M. Sirlanci	Finite Dimensional Approximation and Convergence in the Estimation of the Distribution of, and Input to, Random Abstract Parabolic Systems with Application to the Deconvolution of Blood/Breath Alcohol Concentration From Biosensor Measured Transdermal Alcohol Level
	M. Wintner	Simultaneous Parameter Estimation and Semi-Blind Deconvolution in Infinite-Dimensional Linear Systems with Unbounded Input and Output
2019	S. Li	Identifying Drinking Patterns Based on Transdermal Alcohol Biosensor Data and a Random Semi-linear Hybrid Partial and Ordinary Differential Equation Model for the Metabolism and Transdermal Transport of Ethanol
	A. Zubair	Bayesian Analysis for Transcriptomic and Genomic Data (with P. Marjoram and S. Nuzhdin).
2020	Z. Dai	An Abstract Hyperbolic Population Model for the Transdermal Transport of Ethanol in Humans: Estimating the Distribution of Random Parameters and the Deconvolution of Breath Alcohol Concentration.
2021	K. Hawekotte	Obtaining Breath Alcohol Concentration from Transdermal Alcohol Concentration Using Bayesian Approaches.
	M. Yao	Linear Quadratic Control, Estimation, and Tracking for Random Abstract Parabolic Systems with Application to Transdermal Alcohol Biosensing.
	L. Asserian	Prohorov Metric-Based Nonparametric Estimation of the Distribution of Random Parameters in Abstract Parabolic Systems with Application to the Transdermal Transport of Alcohol.
2022	C. Oszkinat	On the Application of Physics-Informed Machine Learning Techniques for the Estimation and Uncertainty Quantification in a Diffusion Model for a Transdermal Alcohol Biosensor.

POST-DOCTORAL MENTORING

2010 - 2013	Dr. Rongjie Lai (Currently tenure track at RPI)
2012 - 2015	Dr. Weiwei Hu (Currently tenure track at Oklahoma State Univ.)
2016 – 2018	Dr. Gerrit Welper (Currently tenure track at Univ. Central Florida)

EXTERNAL FUNDING

1984 - 1987	Air Force Office of Scientific Research (AFOSR) $113,477
1987 - 1990	Air Force Office of Scientific Research (AFOSR) $189,382
1990 - 1994	Air Force Office of Scientific Research (AFOSR) $109,743
1994 - 2001	Air Force Office of Scientific Research (AFOSR) /DARPA Multi-disciplinary University Research Initiative (MURI) Grant, $4,673,361 (Co-PI)
1997 - 1999	National Science Foundation (NSF) $60,000
1999 - 2004	Office of Naval Research (ONR) Multi-disciplinary University Research Initiative (MURI) Grant, $1,419,900 (Co-PI)
2003 – 2006	National Institute on Alcohol Abuse and Alcoholism (NIAAA) (Part of NIH) Grant, $3,129,134.00 (Co-PI)
2005 – 2007	Cognitively Augmented Design – Quantum Technology Program Optimal Design of Nanoscale Electronic Devices (DARPA) (Co-PI).
2007 – 2009	National Institute on Alcohol Abuse and Alcoholism (NIAAA) NIAAA Phase II SBIR grant 3 R44 AA014118-03S1 (supplemental to grant 2 R44 AA014118-03), Wireless, Low -Maintenance Transdermal Alcohol Sensor
2007 - 2008	Air Force Office of Scientific Research (AFOSR) Ensemble Techniques for Determining Globally Optimal Designs for Problems with Broadly Stated Design Objectives.
2009 - 2011	National Institute of Alcohol Abuse and Alcoholism (NIAAA) , Real-Time Assessment of Alcohol Use Across ALDH2 Genotypes.
2009 - 2013	National Science Foundation, SOLAR: Ultrabroad Spectral Bandwidth Excitonic Thin Film Solar Cells Based on Carbon Nanotubes.
2009 - 2013	California Post-Secondary Education Commission Improving Teacher Quality MMEMS: Multimodal Measurement in Engineering, Math and Sciences.
2012 – 2014	A Multi-Component Data Processing Program for Transdermal Alcohol Sensors (as consultant). National Institute for Alcohol Abuse and Alcoholism (NIAAA)
2013 – 2019	Physical Processes Governing Energy and Momentum Flows on Multiple Scales in Near-Earth Space Using a First-Principles-Based Data Assimilation System for the Global Ionosphere-Thermosphere- Electrodynamics.

	(Co-PI), National Aeronautics and Space Administration (NASA) and National Science Foundation (NSF).
2012 – 2019	Medium Range Thermosphere Ionosphere Storm Forecasts, (Co-PI), National Aeronautics and Space Administration (NASA) and National Science Foundation (NSF).
2017 - 2022	Examining the Impact of Stress on the Emotionally Reinforcing Properties of Alcohol in Heavy Social Drinkers: A Multimodal Investigation Integrating Laboratory and Ambulatory Methods, National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institutes of Health (NIH), Consultant, (P.I. C. Fairbairn, UIUC), (R01AA025969, $1,691,339).
2018 - 2023	Estimating BrAC/BAC from Transdermal Alcohol: Combining First-Principles Physiological Models with Machine-Learning to Create Software to Optimally Process and Quantitatively Interpret Biosensor Data, National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institutes of Health (NIH), (Co-PI with S. Luczak, Co-I's: J.Bartroff, L. Goldstein, and C. Wang), (R01 AA026368) $2,590,826.

INTERNAL FUNDING

1997 - 1999	Zumberge Research and Innovation Fund $7,500
1998 – 2000	USC Undergraduate Research Program $12,000
2006 - 2007	USC Fund for Innovative Undergraduate Teaching ($12,000
2012 – 2013	Development of a Plan for the Creation of the Trojan Predictive Policing System (TPPS) ($12,000).
2018 – 2019	Mentor (with Co-Mentor S. E. Luczak.). Training in Alcohol Administration and Modeling Research. Undergraduate Research Associates Program (URAP). Office of the Provost, USC, Total costs $5,500.

PUBLICATIONS

1. Approximation Techniques for Parameter Estimation in Hereditary Control Systems, (with H. T. Banks), Proceedings 19th IEEE Conference on Decision and Control, Albuquerque, NM, December, 1980, pp. 741-743

2. A Discrete Approximation Framework for Hereditary Systems, Journal of Differential Equations, 40 (1981), pp. 377-449.

3. Spline Approximations for Linear Nonautonomous Delay Systems, (with H.T. Banks), Journal of Math. Analysis and Applications, 96 (1983), pp. 226-268.

4. Discrete Approximation Methods for Parameter Identification in Delay Systems, SIAM J. Control and Optimization, 22 (1984), pp. 95-120.

5. Difference Equation State Approximations for Nonlinear Hereditary Control Problems, SIAM J. Control and Optimization, 22 (1984), pp. 302-326.

6. A Spline Based Technique for Computing Riccati Operators and Feedback Controls in Regulator Problems for Delay Equations, (with H.T. Banks and K. Ito), SIAM J. Scientific and Statistical Computing, 5 (1984), pp. 830-855.

7. Approximation Techniques for Parameter Estimation and Feedback Control for Distributed Models of Large Flexible Structures (with H.T. Banks), Proceedings, Workshop on Identification and Control of Large Flexible Space Structures at the 1984 American Control Conference, San Diego, CA, June, 1984, pp. 145-156.

8. A Numerical Scheme for the Identification of Hybrid Systems Describing the Vibration of Flexible Beams with Tip Bodies, Journal of Math Analysis and Applications, 116 (1986), pp. 262-288.

9. Fully Discrete Approximation Methods for the Estimation of Parabolic Systems and Boundary Parameters, (with H.T. Banks), ACTA Applicandae Mathematicae, 7 (1986), pp. 1-34.

10. Spline-Based Rayleigh-Ritz Methods for the Approximation of the Natural Modes of Vibration for Flexible Beams with Tip Bodies, Quarterly of Appl. Math., Volume XLIV (1986), pp. 169-185.

11. Approximation Methods for Inverse Problems Involving the Vibration of Beams with Tip Bodies, Proceedings, 23rd IEEE Conference on Decision and Control, Las Vegas, Nevada, December, 1984, pp. 1692-1694.

12. A Cubic Spline Based Approximation Scheme for the Estimation of Parameters in Hybrid Systems Involving Beams with Attached Tip Bodies, Proceedings, The University of

Arkansas Annual Lecture Series in The Mathematical Sciences, Fayetteville, Arkansas, April, 1984, pp. 96-115,

13. A Galerkin Method for the Estimation of Parameters in Hybrid systems governing the Vibration of Flexible Beams with Tip Bodies, (with H. T. Banks), ICASE Report No. 85-7, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, VA, February, l985.

14. Approximation Methods for the Solution of Inverse Problems in Lake and Sea Sediment Core Analysis, (with H. T. Banks), Proceedings, 24th IEEE Conference on Decision and Control, Ft. Lauderdale, Florida, December, 1985, pp. 732-736.

15. Numerical Schemes for the Estimation of Functional Parameters in Distributed Models for Mixing Mechanisms in Lake and Sea Sediment Cores, (with H. T. Banks), Inverse Problems, 3 (1987), pp. 1-22.

16. Numerical Approximation for the Infinite-Dimensional Discrete-Time Optimal Linear-Quadratic Regulator Problem, (with J.S. Gibson), SIAM J. Control and Optimization, 26 (1988), pp. 428-451.

17. Shifting the Closed-Loop Spectrum in the Optimal Linear Quadratic Regulator Problem for Hereditary Systems, (with J. S. Gibson), IEEE Transactions on Automatic Control, AC-32 (1987), pp. 831-836.

18. Parameter Estimation Techniques for Distributed Systems, (with H. T. Banks), to appear in a volume in the SIAM Frontiers of Applied Mathematics Series, in preparation.

19. Estimation of Stiffness and Damping in Cantilevered Euler-Bernoulli Beams with Tip Bodies, (with H. T. Banks and C. Wang), Proceedings, Fourth IFAC Symposium on Control of Distributed Parameter Systems, Los Angeles, CA, June, 1986.

20. Computational Methods for the Identification of Spatially Varying Stiffness and Damping in Beams (with H. T. Banks), Control - Theory and Advanced Technology, 3 (1987), pp. 1-32.

21. Methods for the Identification of Material Parameters in Distributed Models for Flexible Structures, (with H. T. Banks and J. M. Crowley), Mathematica Aplicada e Computacional, 5 (1986), pp. 139-168.

22. The Identification of a Distributed Parameter Model for a Flexible Structure, (with H. T. Banks, S. S. Gates and Y. Wang), SIAM J. Control and Optimization, 26(1988), pp. 743-762.

23. Computational Methods for Optimal Linear - Quadratic Compensators for Infinite Dimensional Discrete-Time Systems, (with J.S. Gibson), Proceedings of International Conference on Control and Identification of Distributed Systems, Springer-Verlag Lecture

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